NISTIR XXXX Draft

Face Recognition Technology Evaluation (FRTE)

Part 1: Verification

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This publication is available free of charge from:
https://www.nist.gov/programs-projects/face-recognition-vendor-test-frvt-ongoing

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Craig Burkhardt, Acting Under Secretary of Commerce for Standards and Technology and Acting NIST Director

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DISCLAIMER

Specific hardware and software products identified in this report were used in order to perform the evaluations described in this document. In no case does identification of any commercial product, trade name, or vendor, imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the products and equipment identified are necessarily the best available for the purpose.

INSTITUTIONAL REVIEW BOARD

The National Institute of Standards and Technology's Research Protections Office reviewed the protocol for this project and determined it is not human subjects research as defined in Department of Commerce Regulations, 15 CFR 27, also known as the Common Rule for the Protection of Human Subjects (45 CFR 46, Subpart A).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

FRTE STATUS

This report is a draft NIST Interagency Report, and is open for comment. It is the thirty seventh edition of the report since the first was published in June 2017. Prior editions of this report are maintained on the FRTE website, and may contain useful information about older algorithms and datasets no longer used in FRTE.

FRTE remains open: All tracks of the FRTE are open to new algorithm submissions.

2025-01-22 changes since 2025-12-19:

- We have added results for first algorithms from five developers: CAKE by VPBank, RealSense, Sum and Substance Ltd, Transmit Security Ltd, and Vaidio.
- We have added results for new algorithms from eleven returning developers: Beijing DeepSense Technologies, Compal Electronics, Candour Biometrics, Clearview AI Inc, IE SARSENOV, Miaxis Biometrics, Onfido, Paravision, Shanghai Jiao Tong University, STCON LLC, and Toshiba.

2025-12-19 changes since 2025-09-30:

- We have added results for first algorithms from one developers: Sparktek International Pte Ltd.
- We have added results for new algorithms from 13 returning developers: BioID GmbH, Chunghwa Telecom, Dermalog, Hyundai Motor Company, IDENTY, Innovatrics, InterLink labs, Matrix Comsec Pvt Ltd, Sightropic, Trust Stamp, Viettel Artificial Intelligence and Data Services Center, Viettel High Technology, and Vsoft.

2025-09-30 changes since 2025-08-13:

- We have added results for first algorithms from three developers: Biometrik Systems Private Limited, OOTO AI, and Toss.
- We have added results for new algorithms from four returning developers: Jaak IT, Online Mobile Services JSC, Regula Forensics, and Unissey

2025-08-13 changes since 2025-07-15:

- We have added results for first algorithms from four developers: BTS Digital, IE SARSENOV, UZINFOCOM, and Vsoft.
- We have added results for new algorithms from seventeen returning developers: 2060.io, Beijing DeepSense Technologies, ID R&D Inc, Innovatrics, IntelliVIX, Metsakuur, Mobai, NextMeta Labs, Neurotechnology, Onfido, QazSmartVision.AI, ROC, STCON LLC, Toshiba, VinBigData, Vision-Box, and Visica AI Solutions.

2025-07-15 changes since 2025-05-28:

- We have added results for first algorithms from three developers: Matrix Comsec Pvt Ltd, PNPSecure, and Urielsoft Co. Ltd.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- ▷ We have added results for new algorithms from eleven returning developers: Daon, Dermalog, Hyundai Motor Company, Incode Technologies Inc, Intel Research Group, Kloudspot Inc, Omnigarde Ltd, Paravision, Universidade de Coimbra, Viante.AI, and Vietnam Posts and Telecommunications Group.

2025-05-28 changes since 2025-04-25:

- ▷ We have added results for new algorithms from seven returning developers: BioID GmbH, Cubox, DiDi ChuXing Technology, InterLink labs, IDENTY, PAPIL11 S.R.O., and Trust Stamp.

2025-04-25 changes since 2025-03-18:

- ▷ We have added results for first algorithms from seven developers: ArVİs Teknoloji San.Tic.A.Ş., Compal Electronics, FCI Vietnam, GTEL OTS JSC, Shenzhen Polytechnic University, Sightropic, and TNG Digital Sdn Bhd.
- ▷ We have added results for new algorithms from eleven returning developers: Awidit Systems, Cyberextruder, FRP LLC, Kasikorn Labs, NCS Pte Ltd, Nominder, Shanghai Jiao Tong University, STCON LLC, Tech5 SA, Veridas Digital Authentication Solutions S.L., and Viettel High Technology.

2025-03-18 changes since 2025-03-05:

- ▷ We have added results for first algorithms from one developers: FaiceTech Ltd.
- ▷ We have added results for new algorithms from ten returning developers: Beijing DeepSense Technologies, BioID Technologies SA, EI Networks Private Ltd, Hangzhuo AIlu Network Information Technology, Innovatrics, Private Identity LLC, Samsung S1 Corp, TigerIT Bangladesh Ltd, Via Technologies Inc, and Viettel Cyberspace Center.

2025-03-05 changes since 2025-01-30:

- ▷ We have added results for first algorithms from three developers: 2060.io, MB Bank, and Visica AI Solutions
- ▷ We have added results for new algorithms from twelve returning developers: AFR Engine, AI Implementation Group, Authme, Hyundai Motor Company, FacePhi, Inspur (Beijing) Electronic Information Industry Co, LightVision Inc, QazSmartVision.AI, ROC, Toshiba, Techainer, and VinBigData.

2025-01-30 changes since 2024-12-18:

- ▷ We have added results for first algorithms from four developers: Innov8tif Solutions, Maverick Research, PT Technology Biometric Indonesia, and TTI Group.
- ▷ We have added results for new algorithms from ten returning developers: Coretech Knowledge Inc, Intel Research Group, IQSEC, i2v Systems, PAPIL11 S.R.O., Paravision, Taiwan Mobile, Touchless ID, useB, and Viante.AI.

2024-12-18 changes since 2024-11-08:

- ▷ We have added results for first algorithms from six developers: BioID GmbH, InterLink labs, KYB-AI Ltd, Keyless Technologies, Pyramid Cyber Security + Forensic (P),and Syscake S.r.l..
- ▷ We have added results for new algorithms from sixteen returning developers: Alchera Inc, Awidit Systems, Cubox, DeCloak Intellegences, Beijing DeepSense Technologies, Innovatrics, Kasikorn Labs, Mitek Systems, Mukh Technologies, NCS Pte Ltd, NextMeta Labs, Nominder, PT Autentika Digital Indonesia, Sensetime Group, Shanghai Jiao Tong University, and STCON LLC.

2024-11-08 changes since 2024-10-07:

- ▷ We have added results for first algorithms from two developers: Hyderabad-Centre for Development of Advanced Computing, and TAHAKOM.
- ▷ We have added results for new algorithms from ten returning developers: Candour Biometrics, Cyberextruder, DICIO, First Credit Bureau Kazakhstan, Metsakuur, Mobbeel Solutions, Samsung S1 Corp, Vietnam Payment Solution, VinBigData, and Yuan High-Tech Development.

2024-10-07 changes since 2024-09-16:

- ▷ We have added results for first algorithms from three developers: Enqura, Kloudspot, and Penacomp Systemy Informatyczne.
- ▷ We have added results for new algorithms from fourteen returning developers: Chunghwa Telecom, Cyberlink, Dactionable Technologies, Daon, FPT Information System, Hangzhuo AIlu Network Information Technology, Kakao Bank, Panasonic R+D Center Singapore, Paravision, Private Identity, QazSmartVision.AI, Toshiba, Vietnam Posts and Telecommunications Group, and UNICC-Solution Architecture Section.

2024-09-16 changes since 2024-08-09:

- ▷ We have added results for first algorithms from one developer: Taiwan Mobile.
- ▷ We have added results for new algorithms from eleven returning developers: Cognitec Systems GmbH, Coretech Knowledge Inc, FaceOnLive Inc, Idemia, Intel Research Group, Luxand Inc, Ovision, PAPIL11 S.R.O., Unissey, useB, and Vivotek.

2024-08-09 changes since 2024-07-03:

- ▷ We have added results for first algorithms from seven developers: Affinsys AI Ltd, AI Implementation Group, Celloscope Limited, Hyundai Motor Company, ID R&D Inc, LightVision Inc and NextMeta Labs.
- ▷ We have added results for new algorithms from eleven returning developers: AFR Engine, Antheus Technologia, CTBC Bank, Innovatrics, Mitek Systems, Neurotechnology, Nominder, Seventh Sense Artificial Intelligence, Universidade de Coimbra, University of Surrey-CVSSP, Viettel Cyberspace Center, Vision-Box and Yoti.

2024-07-03 changes since 2024-05-30:

- ▷ We have include all algorithms evaluated since the ongoing FRTE evaluation started in 2017. Previously we listed only results for each developer's two most recent implementations. The main results page has been revised with a "by developer" tab which lists only the most accurate algorithm from each developer, where accuracy is defined by the lowest FNMR value for the visa-border dataset.
- ▷ We have added results for first algorithms from two developers: Taiwan Computer Vision and Telexper International.
- ▷ We have added results for new algorithms from fifteen returning developers: Alchera Inc, Beijing DeepSense Technologies, Cyberlink Corp, Dermalog, FacePhi, Facia.ai, FRP LLC, NCS Pte Ltd, Omnigarde Ltd, Online Mobile Services JSC, Qnap Security, ROC, STCON LLC, Videmo Intelligente Videoanalyse, and Viettel Group.

2024-05-30 changes since 2024-04-17:

- ▷ We have added results for first algorithms from three developers: ALTTEKGlobal, Fourthline, and IQSEC
- ▷ We have added results for new algorithms from thirteen returning developers: Candour Biometrics, Chunghwa Telecom, Clearview AI Inc, Cognitec Systems GmbH, Incode Technologies Inc, ioNetworks Inc, HyperVerge Inc, Mobbeel Solutions, Panasonic R+D Center Singapore, QazSmartVision.AI, Vietnam Posts and Telecommunications Group, VinBigData and Yuan High-Tech Development
- ▷ We have retired results for eleven algorithms per our policy to only list results for eleven algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2024-04-17 changes since 2024-03-26:

- ▷ We have added results for first algorithms from four developers: Ovision, Vietnam National Cyber Security Technology Corporation, Vivotek, and Vocalize.
- ▷ We have added results for new algorithms from four returning developers: Intel Research Group, Kakao Bank, Luxand, and Turkcell Technology.
- ▷ We have retired results for nine algorithms per our policy to only list results for four algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2024-03-26 changes since 2024-02-21:

- ▷ We have added results for first algorithms from six developers: FaceLocate, FPT Education, FPT Information System, Kogniza Technology, i2v Systems, and Seamfix.
- ▷ We have added results for new algorithms from eleven returning developers: AFR Engine, Aware, Beijing Hisign Technology, Cu-Face, Dactionable Technologies, First Credit Bureau Kazakhstan, Innovatrics, Nominder, Securif AI, Veridium, and Viettel Cyberspace Center.
- ▷ We have retired results for nine algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2024-02-21 changes since 2024-01-22:

- ▷ We discontinued the visa-visa benchmark in FRTE since Feburary 14th 2024. For highly performing algorithms, the only remaining false negative error in that set were in babies and in a few greyscale poor quality half-tone scans of paper photos.

- ▷ We have added results for first algorithms from four developers: Online Mobile Services JSC, Openedge Technologies, TNI Technoology, and Yoti.
- ▷ We have added results for new algorithms from nine returning developers: CMC Institute of Science and Technology, City and County of Honolulu, Dermalog, Euronovate SA, Maxvision Technology, Megvii/Face++, Neurotechnology, Toshiba, useB, and Universidade de Coimbra.
- ▷ We have retired results for nine algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2024-01-22 changes since 2023-12-15:

- ▷ We have added results for first algorithms from six developer: GPS Vietnam Trading, iCOMM Media & Tech, PAPIL11 S.R.O., QazSmartVision.AI, Sparsh CCTV, and VNIS Joint Stock.
- ▷ We have added results for new algorithms from eight returning developers: Cyberlink Corp, Intellivision, Hangzhuo AIlu Network Information Technology, Lebentech Biometrics, Momentum Digital, Regular Biometrics Solutions, ROC, and Via Technologies Inc.
- ▷ We have retired results for six algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-12-15 changes since 2023-11-21:

- ▷ We have added results for first algorithms from five developer: CMC University, Element System Solutions Company, Fraud.com, Techainer, and Vietnam Payment Solutions.
- ▷ We have added results for new algorithms from thirteen returning developers: Accurascan, Adera Global, Alchera, Aware, Clearview AI, Cognitec Systems, Incode Technologies Inc, Inspur (Beijing) Electronic Information, IntelliVIX, ioNetworks, NHN Corp, PT Autentika Digital Indonesia, and Qnap Security.
- ▷ We have retired results for twelve algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-11-21 changes since 2023-10-27:

- ▷ We have added results for new algorithms from ten returning developers: Coretech Knowledge Inc, Beijing DeepSense Technologies, General Interface Solutions Holding Ltd, Glory, Kakao Brain, Nominder, Smarvist Teknoloji, STCON LLC, Suprema AI Inc, and Yuan High-Tech Development
- ▷ We have retired results for eight algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-10-27 changes since 2023-09-29:

- ▷ We have added results for first algorithms from two developer: Authme and Dactionable Technologies.
- ▷ We have added results for new algorithms from twelve returning developers: Intel Research Group, Guangzhou Pixel Solutions, Kasikorn Labs, Kakao Bank, Luxand, Megvii/Face++, Panasonic R+D Center Singapore, Private Identity LLC, Recognito, Seventh Sense Artificial Intelligence, UNICC-Solution Architecture Section, and Universidade de Coimbra.

- We have retired results for eight algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-09-29 changes since 2023-09-09:

- We have added results for first algorithms from one developer: Intozi Tech.
- We have added results for new algorithms from seven returning developers: Euronovate, Maxvision Technology, Miaxis Biometrics, Mukh Technologies, Toshiba, University of Surrey-CVSSP, and useB.
- We have retired results for six algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-09-09 changes since 2023-08-16:

- We have renamed and split FRVT into two sets of technology evaluations: The Face Recognition Technology Evaluation (FRTE) is the umbrella for the ongoing 1:1, 1:N and twins disambiguation tracks; the Face Analysis Technology Evaluation (FATE) holds the morph and attacked detection tracks, the quality assessment tracks, and the new age estimation tracks.
- We have added results for first algorithms from two developers: Facehawk and Regular Biometrics Solutions.
- We have added results for new algorithms from eight returning developers: CMC Institute of Science and Technology, Canon, Cu-Face, EI Networks, ICM Airport Technics, Securif AI, Securifai, Vietnam Posts and Telecommunications Group, and Vision Intelligence Center of Meituan
- We have retired results for six algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-08-16 changes since 2023-07-21:

- We have added results for first algorithms from one developers: Facia.ai.
- We have added results for new algorithms from fifteen returning developers: Accurascan, Alchera, FOO, Hangzhuo AIlu Network Information Technology, HyperVerge, ioNetworks, Innovatrics, Nominder, Rank One Computing, Neurotechnology, Tech5, Tripleize, Unissey, UX Labs, and Verigram.
- We have retired results for ten algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-07-21 changes since 2023-06-16:

- We have added results for first algorithms from five developers: DeCloak Intellegences, Innominds Software SEZ India, Trust Stamp, Vcortex Labs, and Viettel Cyberspace Center
- We have added results for new algorithms from fourteen returning developers: AFR Engine, Alice Biometrics, Euronovate SA, IMDS Software, Idemia, IntelliVIX, Intellivision, NHN, Pangiam, STCON, Samtech InfoNet, Veridium, VinBigData, and Vision-Box
- We have retired results for eleven algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.
- We have stopped using wild images in FRVT since May 1st 2023. All results for that set have been removed from the website, and will be removed from future PDF reports.

2023-06-16 changes since 2023-04-20:

- ▷ We have added results for first algorithms from seven developers: EI Networks Private Ltd, General Interface Solutions Holding Ltd, Recognito, Serendipity Ltd, ST Engineering, and useB.
- ▷ We have added results for new algorithms from eighteen returning developers: Advance.AI, AYF Technology, Cyberlink Corp, Incode Technologies Inc, Intel Research Group, Intellibrain Technological Projects, Maxvision Technology, Megvii/Face++, Omnigarde Ltd, Paravision, Qnap Security, Seventh Sense Artificial Intelligence, Shanghai Jiao Tong University, Veridas Digital Authentication Solutions S.L., Universidade de Coimbra, Yuan High-Tech Development, UNICC-Solution Architecture Section, and Verihubs,verihubs-inteligensia.
- ▷ We have retired results for 15 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-04-20 changes since 2023-04-04:

- ▷ We have added results for first algorithms from one developers: IDENTY.
- ▷ We have added results for new algorithms from three returning developers: Metsakuur, Autentika Digital Indonesia, and Verigram.
- ▷ FRVT will re-open 2023-05-01.
- ▷ We have retired results for 3 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-04-04 changes since 2023-03-09:

- ▷ We have added results for first algorithms from six developers: Aratek Biometrics City and County of Honolulu, FOO, Intelligent Control Technology NCS, and Swsam Solutions.
- ▷ We have added results for new algorithms from nine returning developers: Cubox, Glory, InsightFace AI, Miaxis Biometrics, Mukh Technologies, Turkcell Technology, Samsung S1, Via Technologies, and Vision Intelligence Center of Meituan
- ▷ We have retired results for 7 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2023-03-09 changes since 2023-02-01:

- ▷ We have added results for first algorithms from eight developers: Biometric LLC (biometric.vision) KZ, Candour Biometrics, Fast Enterprises, KakaoBank, Mitek Systems, Nominder, Private Identity, and UNICC-Solution Architecture Section.
- ▷ We have added results for new algorithms from 22 returning developers: AFR Engine, Biocube Matrics, CMC Institute of Science and Technology, Cloudwalk - Moontime Smart Technology, Cyberlink Corp, Beijing DeepSense Technologies, First Credit Bureau Kazakhstan, Enface, Hangzhuo AIlu Network Information Technology, Herta Security, IMDS Software, Inspur (Beijing) Electronic Information Industry Co, Intellivision, MicroFocus, Neurotechnology, Pangiam, NSENSE Corp, STCON LLC, Touchless ID, University of Surrey-CVSSP, Vision-Box, and YooniK.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- ▷ We have retired results for 14 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.
- ▷ We have introduced new set of non-frontal portrait to border comparisons. The new images are described in section 2.3 and their use in seciton 3.2.

2023-02-01 changes since 2022-12-15:

- ▷ We have added results for first algorithms from four developers: CU-Face, Korea ID, Onfido, and TrueID-VNG.
- ▷ We have added results for new algorithms from 21 returning developers: Alchera, Armatura, Cogent-Thales, Dermalog, Didi ChuXing Global Face, Gorilla, Hyperverge, Innovatrics, Intel Research, IntelliVIX, Intema-LGL, Kasikorn Labs, Paravision, Rank One Computing, Sensetime Group, Suprema AI, Tech5, Unissey, U. Coimbra Visteam, Vixvizion (Imagus), and Yuan High-Tech Development.
- ▷ We have retired results for 20 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.
- ▷ We have introduced new set of non-frontal portrait to border comparisons. The new images are described in section 2.3 and their use in seciton 3.2.

2022-12-15 changes since 2022-11-06:

- ▷ We have added results for first algorithms from four developers: Miaxis Biometrics, PT Autentika Digital Indonesia, PT Qlue Performa Indonesia, and STCON.
- ▷ We have added results for new algorithms from 14 returning developers: Adera Global, Aiseemu Technology, Chunghwa Telecom,chtface, FRP, Griaule, Line Corporation, Maxvision Technology, Mukh Technologies, Papilon Savunma, Qnap Security, Realnetworks, Securif AI, SQIsoft, and Veridium.
- ▷ We have retired results for 10 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-11-06 changes since 2022-09-26:

- ▷ We have added results for first algorithms from six developers: AFR Engine, CMC Institute of Science and Technology, Saga Densan Center, Turkcell Technology, UXLabs, and Wise AI SDN BHD.
- ▷ We have added results for new algorithms from 14 returning developers: Coretech Knowledge, Cloudwalk - Moontime, Cloudmatrix, Deepglint, Guangzhou Pixel Solutions, Hangzhuo AIlu Network Information Technology, NEO Systems, One More Security, Palit Microsystems, Panasonic R+D Center Singapore, Samsung S1, Seventh Sense Artificial Intelligence, Touchless ID, and Veridas Digital Authentication Solutions S.L.
- ▷ We have retired results for 10 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-09-26 changes since 2022-08-30:

- ▷ We have added results for first algorithms from three developers: Codeline, First Credit Bureau Kazakhstan, and InfoCert.

- ▷ We have added results for new algorithms from 14 returning developers: Advancegroup, Armatura LLC, Beijing Hisign Technology, Cybercore, Cyberlink Corp, Herta Security, ICM Airport Technics, InsightFace AI, Metsakuur, NSENSE Corp, Samsung-SDS, Videmo Intelligente Videoanalyse, Vietnam Posts and Telecommunications Group, and Vision Intelligence Center of Meituan.
- ▷ We have retired results for 11 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-08-30 changes since 2022-07-29:

- ▷ We have added results for first algorithms from two developers: Aximetria, Intellibrain Technological Projects
- ▷ We have added results for new algorithms from twelve returning developers: Alchera Inc, Dermalog, Idemia, Incode Technologies Inc, Intellivision, Kasikorn Labs, Megvii/Face++, Techsign, TuringTech.vip, Universidade de Coimbra, Verijelais, Vixvizon
- ▷ We have retired results for six algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-07-29 changes since 2022-06-27:

- ▷ We have added results for first algorithms from seven developers: FRP LLC (Hawaii), IMDS Software, Inspur (Beijing) Electronic Information Industry, Intema - LGL Group, PAPAGO, Qaz Biometric Systems, and VIDA-Digital Identity
- ▷ We have added results for new algorithms from nine returning developers: Cyberextruder, Glory, Maxvision Technology, Rank One Computing, Securif AI, Suprema AI, Suprema ID, Toshiba, and Yuan High-Tech Development.
- ▷ We have retired results for nine algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-07-29 changes since 2022-06-27:

- ▷ We have added results for first algorithms from seven developers: FRP LLC (Hawaii), IMDS Software, Inspur (Beijing) Electronic Information Industry, Intema - LGL Group, PAPAGO, Qaz Biometric Systems, and VIDA-Digital Identity
- ▷ We have added results for new algorithms from nine returning developers: Cyberextruder, Glory, Maxvision Technology, Rank One Computing, Securif AI, Suprema AI, Suprema ID, Toshiba, and Yuan High-Tech Development.
- ▷ We have retired results for nine algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-06-27 changes since 2022-06-03:

- ▷ We have added results for first algorithms from two developers: Krungthai Bank, and Smartbiometrik.
- ▷ We have added results for new algorithms from thirteen returning developers: Aiseemu, Corsight, Digidata, Griaule, Guangzhou Pixel Solutions, Hangzhuo AI Network Information Technology, Neurotechnology, Real Networks, Samsung S1, Sensetime Group, Smart Engines, Verihubs Inteligensia, and VinBigData.

- We have retired results for eight algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-06-03 changes since 2022-05-05:

- We have added results for first algorithms from seven developers: Jaak IT, Metsakuur, Palit Microsystems, Smarvist Teknoloji, and Touchless ID.
- We have added results for new algorithms from sixteen returning developers: Cyberlink, FaceOnLive, Kakao Enterprise, Line Corporation (Line Clova), Multi-Modality Intelligence, NEO Systems, and Unissey
- We have retired results for four algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.
- We have moved the results for the twenty human-difficult pairs used in the May 2018 paper *Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms* by Phillips et al. [1]. to the algorithm-specific report cards (example: PDF).
- Likewise, we have added figures showing impostor distribution shifts across demographics to the report card.

2022-05-05 changes since 2022-03-18:

- We have added results for first algorithms from seven developers: Accurascan, DICIO, FacePhi, Pangiam, University of Surrey-CVSSP, and Veridium.
- We have added results for new algorithms from sixteen returning developers: ACI Software, Canon Inc, Cloudwalk - Moontime Smart Technology, Cybercore,

2022-05-05 changes since 2022-03-18:

- We have added results for first algorithms from seven developers: Accurascan, DICIO, FacePhi, Pangiam, University of Surrey-CVSSP, and Veridium.
- We have added results for new algorithms from sixteen returning developers: ACI Software, Canon Inc, Cloudwalk - Moontime Smart Technology, Cybercore, Cyberextruder, Gemalto Cogent, HyperVerge Inc, KuKe3D Technology, Megvii/Face++, Mobbeel Solutions, Panasonic R+D Center Singapore, Qnap Security, Samsung-SDS, Vietnam Posts and Telecommunications Group, Viettel Group, and Vision Intelligence Center of Meituan.
- We have retired results for 12 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-03-18 changes since 2022-02-23:

- We have added support for the detection of multiple people in a single image (see Section 1.2). Specifically the API allows an algorithm to extract features from one or more faces it detects in an image. NIST scores such cases as a correct match when any detected face matches the reference photo, and as a false positive when either face matches a non-mated reference photo. The expected effect of doing this will be to improve reported false non-match rates, and to minimally elevate false match rates. This technique was only applied to images of type "border" and "kiosk".

- ▷ We have added results for first algorithms from four developers: IntelliVIX, Kasikorn Labs, Lebentech Biometrics, and Wicket.
- ▷ We have added results for new algorithms from 10 returning developers: Chunghwa Telecom, Cloudmatrix, Beijing DeepSense Technologies, FarBar Inc, Imagus Technology Pty, Intellivision, Maxvision Technology, NHN Corp, Seventh Sense Artificial Intelligence, and Verigram.
- ▷ We have retired results for 4 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-02-23 changes since 2022-01-24:

- ▷ We have added results for first algorithms from four developers: AFIS and Biometrics Consulting, Digidata, Graymatics, Hangzhuo AIlu Network Information Technology, KnowUTech LLC, Sukshi Technology Innovation, T4iSB, and TuringTech.vip
- ▷ We have added results for new algorithms from 18 returning developers: Cognitec Systems GmbH, GeoVision Inc, Glory, Herta Security, Intel Research Group, InsightFace AI, Kakao Enterprise, N-Tech Lab, Omnigarde Ltd, Papilon Savunma, Paravision, Realnetworks Inc, Reveal Media Ltd, Shenzhen Inst Adv Integrated Tech CAS, Suprema AI Inc, Toshiba, Universidade de Coimbra, and Yuan High-Tech Development
- ▷ We have retired results for 14 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2022-01-24 changes since 2022-01-20:

- ▷ We have added results for new algorithms from one returning developer: Vocord.

2022-01-20 changes since 2021-12-18:

- ▷ We have added results for first algorithms from four developers: Armatura, Beyne.AI, One More Security, and VinBigData
- ▷ We have added results for new algorithms from 19 returning developers: AuthenMetric, BOE Technology Group, Cybercore, Cyberlink, Dahua Technology, FaceTag Co, Innovatrics, Megvii, Mobbeel Solutions, Neurotechnology, Oz Forensics, Rank One Computing, Regula Forensics, Samsung S1, Securif AI, Sensetime Group, TigerIT Americas, Videmo Intelligente Videoanalyse, and YooniK.
- ▷ We have retired results for 14 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

: **2021-12-16** changes since 2021-11-22:

- ▷ We have added results for first algorithms from five developers: Alfabeta, Cloudmatrix, Euronovate SA, FaceOnLive Inc, and Mobipin Technology.
- ▷ We have added results for new algorithms from ten returning developers: ACI Software, ITMO University, NEO Systems, Guangzhou Pixel Solutions, Panasonic R+D Center Singapore, Qnap Security, Scanovate, Tevian, Unissey, and Vietnam Posts and Telecommunications Group.
- ▷ We have retired results for eight algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- ▷ We have revamped the figure showing performance on 20 pairs of open-source images. It now color-codes false negatives and postives against a default threshold value.

2021-11-22 changes since 2021-10-28:

- ▷ We have added results to the website for kiosk-collected images where the design and geometry configuration mean that many images have considerable downward pitch angle. In some images, the face is partially cropped. Some images have other background faces.
- ▷ We have stopped using child exploitation images in FRVT, as we lost access to the imagery. All results for that set have been removed from the website, and will be removed from future PDF reports.
- ▷ We have added results for first algorithms from seven new developers: CUDO Communication, Daon, KuKe3D Technology, Mantra Softech India, Maxvision Technology, Multi-Modality Intelligence, and Samsung-SDS.
- ▷ We have added results for new algorithms from seven returning developers: Acer Incorporated, Cloudwalk-Moontime Smart Technology, Gorilla Technology, ID3 Technology, Incode Technologies, NSENSE Corp., and SQIsoft.
- ▷ We have retired results for six algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-10-28 changes since 2021-09-08:

- ▷ We have substantially revised the algorithm-specific report cards that are linked from the FRVT results page. (Example: HTML).
- ▷ We have added results for first algorithms from eight new developers: Beijing Mendaxia Technology, Beijing Hisign Technology, Biocube Matrics, Clearview AI, Reveal Media, Toppan ID Gate, Verigram, and Viettel High Technology.
- ▷ We have added results for new algorithms from thirty returning developers: 20Face, 3divi, Canon Inc Chunghwa Telecom, Corsight, Decatur Industries, Deepglint, Dermalog, FaceTag, Fiberhome Telecommunication Technologies, GeoVision, ICM Airport Technics, Imagus Technology, InsightFace AI, Kakao Enterprise, Kookmin University, Line Corporation, N-Tech Lab, NotionTag Technologies, Realnetworks, Suprema ID, Taiwan-Certificate Authority, Toshiba, Tripleize, Trueface.ai, Veridas Digital Authentication, Visidon, VisionLabs, YooniK, and Yuan High-Tech Development.
- ▷ We have retired results for twenty algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-09-08 changes since 2021-08-02:

- ▷ We have added results for first algorithms from seven new developers: Griaule, SQIsoft, Qnap Security, Techsign, Smart Engines, Verihubs, and Wuhan Tianyu Information Industry.
- ▷ We have added results for new algorithms from sixteen returning developers: ADVANCE.AI, AuthenMetric, CloudSmart Consulting, Code Everest Pvt, Cognitec Systems, Thales Gemalto Cogent, Intel Research Group, Omnigarde, Oz Forensics, Rank One Computing, Samsung S1 Corp, Securif AI, Tevian, TigerIT Americas, Universidade de Coimbra, and Vigilant Solutions
- ▷ We have retired results for eleven algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-08-02 changes since 2021-06-25:

- We have added results for first algorithms from eight new developers: Bee the Data, Closeli Inc, Coretech Knowledge Inc, Deepsense (France), ioNetworks Inc, Kakao Pay Corp, Seventh Sense Artificial Intelligence, and SK Telecom.
- We have added results for new algorithms from fifteen returning developers: Alchera Inc, Adera Global PTE, Aware, Bresee Technology, Cyberlink Corp, Expasoft LLC, Fujitsu Research and Development Center, Gorilla Technology, Idemia, Neurotechnology, NEO Systems, NHN Corp, Paravision, Panasonic R+D Center Singapore, and Shenzhen University-Macau University of Science and Technology.
- We have retired results for twelve algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-06-25 changes since 2021-05-21:

- We have added results for first algorithms from six new developers: Alice Biometrics, BOE Technology Group, Fincore, Neosecu, Sodec App, and Yuntu Data and Technology.
- We have added results for new algorithms from seven returning developers: Incode Technologies, HyperVerge, Mobbeel Solutions, Guangzhou Pixel Solutions, Remark Holdings, Sensetime, and Vietnam Posts and Telecommunications Group.
- We have retired results for four algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-05-21 changes since 2021-04-26:

- We have added results for first algorithms from five new developers: Ekin Smart City Technologies, Suprema ID, Tripleize, Taiwan-Certificate Authority, and Vision Intelligence Center of Meituan.
- We have added results for new algorithms from eight returning developers: ID3 Technology, Imagus Technology, Momentum Digital, N-Tech Lab, NSENSE, Shanghai Jiao Tong University, Vision-Box, and Yuan High-Tech Development
- We have retired results for seven algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-04-26 changes since 2021-04-16:

- We have added results for first algorithms from three new developers: Quantasoft, Rendip, and NEO Systems.
- We have added results for new algorithms from four returning developers: 3Divi, Realnetworks, Veridas Digital Authentication Solutions, and Universidade de Coimbra.
- We have retired results for three algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-04-16 changes since 2021-03-19:

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- We have added results for first algorithms from six new developers: 20Face, Beijing DeepSense Technologies, BitCenter UK, Enface, FaceTag, InsightFace AI, Line Corporation, Lema Labs, Nanjing Kiwi Network Technology, Omnigarde, Regula Forensics, and Suprema.
- We have added results for new algorithms from ten returning developers: CloudSmart Consulting, Dermalog, GeoVision, Neurotechnology, Panasonic R+D Center Singapore, Samsung S1, Securif AI, Trueface.ai, Vigilant Solutions, and Visidon.
- We have retired results for ten algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-03-19 changes since 2021-03-05:

- We have added results for first algorithms from six new developers: Ajou University, AuthenMetric, Code Everest, Corsight, Papilon Savunma, and NHN Corp
- We have added results for new algorithms from seven returning developers: Alchera, Deepglint, Fiberhome Telecommunication Technologies, Kakao Enterprise, Kookmin University, Megvii/Face++, and NotionTag Technologies.
- We have updated many of the hyperlinked HTML report-cards to include seven figures on demographic dependence. Figures of this kind first appeared, and are documented in, the December 2019 document, NIST Interagency Report 8280 on demographic differentials in face recognition. The figures quantify false negative dependence on demographics using "visa-border" comparisons, and false positive dependence using comparisons of "application" photos that uniformly of quality and similar to visa photos.

2021-03-05 changes since 2021-01-19:

- We have added results for first algorithms from three new developers: IVA Cognitive, Mobbeel, and MoreDian Technology.
- We have added results for new algorithms from returning developers: Ability Enterprise - Andro Video, ACI Software, Adera Global, AnyVision, BioID Technologies, China Electronics Import-Export, Cognitec Systems, Fujitsu Research and Development Center, Glory, Guangzhou Pixel Solutions, Hengrui AI Technology, Incode Technologies, Intel Research, iQIYI, Mobai, Oz Forensics, Paravision, VisionLabs, and Xforward AI Technology.
- We have added a new "resources" tab to the main webpage. It includes sortable columns for data related to speed, model size, storage, and memory consumption.
- We have retired results for 13 algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2021-01-19 changes since 2020-12-18:

- This report adds results for first algorithms from four developers: Herta Security, Irex AI, Shenzhen University-Macau University of Science and Technology, and Vietnam Posts and Telecommunications Group. See Table 20 for more information.
- The report also includes results for thirteen developers who have previously submitted algorithms: Bresee Technology, Canon (previously Canon Information Technology (Beijing)), Cyberlink, CSA IntelliCloud Technology, Dahua Technology, ID3 Technology, Imagus Technology (Vixvizion), Moontime Smart Technology, N-Tech Lab, Thales Cogent, Veridas Digital Authentication Solutions, Vocord, and Yuan High-Tech Development.

- We have retired results for ten algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

2020-12-18 changes since 2020-10-09:

- This report adds results for first algorithms from ten developers: BitCenter UK, CloudSmart Consulting, Cubox, Institute of Computing Technology, Naver Corp, Minivision, NSENSE Corp, Viettel Group, Visage Technologies, and Xiamen University. See Table 20 for more information.
- The report also includes results for eighteen developers who have previously submitted algorithms: ADVANCE.AI, Awidit Systems, Chosun University, Dermalog, GeoVision, ICM Airport Technics, Idemia, Institute of Information Technologies, Kakao Enterprise, Neurotechnology, Panasonic R+D Center Singapore, Rank One Computing, Sensetime Group, Shanghai Jiao Tong University, TigerIT Americas LLC, Vigilant Solutions, Winsense, and YooniK
- We have retired results for twelve algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

Changes since September 18, 2020:

- This report adds results for first algorithms from five developers: Aigen, Cortica, Kookmin University, Securif AI and Vinai.
- The report also includes results for three developers who have previously submitted algorithms: Fujitsu Laboratories, Hengrui AI, and X-Forward AI.
- In the per-algorithm report-cards linked from tables and the main webpage, we have added a chart to showing reduction in error rates over the course of FRVT i.e. from 2017 onwards for all algorithms supplied by that developer. Similarly we have added a chart showing error rate reductions for our test of protective face mask verification.
- We plan to continue evaluating algorithms on various mask datasets. We hold that algorithms should be capable of detecting masks and verifying identity of all combinations of masked and unmasked faces. We have accordingly increased the amount to time allowed to extract those features from 1.0 to 1.5 seconds.

Changes since August 25, 2020:

- This report adds results for first algorithms from eight new developers. Akurat Satu Indonesia, Cybercore, Decatur Industries, Innef Labs, Satellite Innovation/Eocortex, Expasoft, and Mobai.
- The report includes results for seven developers who have previously submitted algorithms: 3Divi, BioID Technologies, Incode Technologies, Innovatrics, iSAP Solution, Synology, and Tevian.
- We have retired results for five algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

Changes since July 27, 2020:

- We have introduced per-algorithm report sheets. These are HTML documents linked from the accuracy tables in this report (i.e. Table 84) and on the FRVT 1:1 homepage. The sheets contain interactive graphics allowing, for example, mouseover exploration of FNMR(T) and FMR(T). Some of their content had previously appeared in this document.
- This report adds results for algorithms from six new developers. ACI Software, Bresee Technology, Fiberhome Telecommunication Technologies, Imageware Systems, Oz Forensics, and Pensees.
- The report includes results for thirteen developers who have previously submitted algorithms: Canon Information Technology (Beijing), Cyberlink, Dahua Technology, Gorilla Technology, ID3 Technology, Intel Research Group, iQIYI Inc, Momentum Digital, Netbridge Technology, Tech5 SA, Shenzhen AiMall Tech, Vigilant Solutions, and VisionLabs.
- We have retired results for nine algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.

Changes since May 18, 2020:

- The report is the first FRVT update since the pandemic closed it from March to June 2020.
- This report includes results for algorithms from nine new developers: GeoVision Inc, Su Zhou NaZhi-TianDi Intelligent Technology, YooniK, AYF Technology, PXL Vision AG, Yuan High-Tech Development, Beihang University-ERCACAT, ICM Airport Technics, and Staqu Technologies
- This report includes results for algorithms from 15 returning developers Acer Incorporated, Antheus Technologia, Chosun University, Chunghwa Telecom, Idemia, Moontime Smart Technology, Neurotechnology, Guangzhou Pixel Solutions, Panasonic R+D Center Singapore, Rank One Computing, Scanovate, Shanghai Universiy - Shanghai Film Academy, Synesis, Trueface.ai, and Veridas Digital Authentication Solutions
- We have retired results for ten algorithms per our policy to only list results for two algorithms per developer. Results for retired algorithms appear in prior versions of this report in the archive.
- We separated timing and other resource consumption from the main participation table. The new Table 52 includes template generation durations for four kinds of images, not just mugshots.
- We have published a separate report, NIST Interagency Report 8311 on accuracy of pre-pandemic algorithms on subjects wearing face masks. We plan to track improvements in accuracy on masked images going forward. In particular, we invite submission of algorithms that can detect whether a person is wearing a mask, extract features from the full face or the exposed periocular region, and do appropriate comparison. We do not intend to evaluate algorithms that assume 100% of images will be of masked individuals.

Changes since March 25, 2020:

- The report is a maintenance release - it does not add any new algorithms, and FRVT has been closed to new algorithms since mid March 2020.
- We modified the primary accuracy summary, Table 84, as follows:
  - For visa images, the column for FNMR at FMR = 0.0001 has been removed. The visa images are so highly controlled that the error rates for the most accurate algorithms are dominated by false rejection of very young children and by the presence of a few noisy greyscale images. For now, two visa columns remain: FNMR at FMR= 10^{-6} and, for matched covariates, FNMR at FMR= 10^{-4}.

- ▷▷ We have inserted a new column labelled "BORDER" giving accuracy for comparison of moderately poor webcam border-crossing photos that exhibit pose variations, poor compression, and low contrast due to strong background illumination. The accuracies are the worst from all cooperative image datasets used in FRVT.

- ▷ Accordingly, we updated the failure-to-template rates in Table 108.
- ▷ We withdrew a figure showing how false matches are concentrated in certain visa images used in cross-comparison, because it didn't attempt to include demographic information.

Changes since February 27, 2020:

- ▷ The report adds results algorithms from two new developers: Beijing Alleyes Technology, and the Chinese University of Hong Kong. Results for newly submitted algorithms from two other developers will appear in the next report.
- ▷ The report adds results for algorithms from thirteen returning developers: ASUSTek Computer, Aware, Cyberlink Corp, Gorilla Technology, Innovative Technology, Kakao Enterprise, Lomonosov Moscow State University, Panasonic R+D Center Singapore, Shenzhen AiMall Technology, Shenzhen Intellifusion Technologies, Synology, Tech5 SA, and Via Technologies.
- ▷ Per policy to only list results for two algorithms per developer, we have dropped results for algorithms from Aware, Cyberlink, Gorilla Technology, Kakao Enterprise, Lomonosov Moscow State University, Panasonic R+D Center Singapore, and Tech5 SA.

Changes since January 20, 2020:

- ▷ The report adds results for five new developers: Ability Enterprise (Andro Video), Chosun University, Fujitsu Research and Development Center, University of Coimbra, and Xforward AI Technology.
- ▷ The report adds results for algorithms from six returning developers: AlphaSSTG, Incode Technologies, Kneron. Shanghai Jiao Tong University, Vocord, and X-Laboratory.
- ▷ We have corrected template comparison timing numbers for algorithms submitted September 2019 to January 2020. The values reported previously were slower due to a software bug.
- ▷ We have dropped results for algorithms from Vocord and Incode per policy to only list results for two algorithms per developer.
- ▷ The FRVT 1:1 homepage has been updated with latest accuracy results.
- ▷ The FRVT 1:N homepage now includes an update to the September 2019 NIST Interagency Report 8271. The new report adds results for one-to-many search algorithms submitted to NIST from June 2019 to January 2020.

Changes since January 6, 2020:

- ▷ Section 2 has been updated to better describe the Visa and Border images. The caption for Table 84 has been updated to better relate the accuracy values to particular image comparisons.
- ▷ The report adds results for five new developers: Acer, Advance.AI, Expasoft, Netbridge Technology, and Videmo Intelligente Videoanalyse.
- ▷ The report adds results for algorithms from 7 returning developers: China Electronics Import-Export Corp, Intel Research Group, ITMO University, Neurotechnology, N-Tech Lab, Rokid, and VisionLabs.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- We have dropped results from this edition of the report per policy to only list results for two algorithms per developer: N-Tech Lab, Neurotechnology, ITMO, Visionlabs, and CEIEC.
- The FRVT homepage has been updated with latest accuracy results.

Changes since November 11, 2019:

- Table 52 has been updated to include runtime memory usage. This is the first time such a quantity has been reported. The value is the peak size of the resident set size logged during enrollment of single images.
- We have migrated summary results table to a new platform that supports sortable tables: https://pages.nist.gov/frvt/html/frvt11.html
- The report adds results for four new developers: Antheus Technologia, BioID Technologies SA, Canon Information Tech. (Beijing), Samsung S1 (listed in the tables as S1), and Taiwan AI Labs.
- The report adds results for algorithms from 13 returning developers: Anke Investments, Chunghwa Telecom, Deepglint, Institute of Information Technologies, iQIYI, Kneron, Ping An Technology, Paravision, KanKan Ai, Rokid Corporation, Shanghai Universiy - Shanghai Film Academy, Veridas Digital Authentication Solutions, and Videonetics Technology.
- We have dropped results from this edition of the report per policy to only list results for two algorithms per developer: remarkai-000, veridas-001, sensetime-001, iit-000, anke-003, and everai-002. Results for these are available in prior editions of this report linked from the FRVT page.
- We issued NIST Interagency Report 8280: FRVT Part 3: Demographics on 2019-12-19. It includes results for many of the algorithms covered by this report.

Changes since October 16, 2019:

- The report adds results for ten new developers: Ai-Union Technology, ASUSTek Computer, DiDi ChuXing Technology, Innovative Technology, Luxand, MVision, Pyramid Cyber Security + Forensic, Scanovate, Shenzhen AiMall Tech, and TUPU Technology.
- The report adds results for 12 returning developers: CTBC Bank Glory Gorilla Technology Guangzhou Pixel Solutions Imagus Technology Incode Technologies Lomonosov Moscow State University Rank One Computing Samtech InfoNet Shanghai Ulucu Electronics Technology Synesis, and Winsense.
- We have dropped results from this edition of the report per policy to only list results for two algorithms per developer: glory-000, gorilla-002, incode-003, rankone-006, and synesis-004.
- Results for five recently submitted algorithms will appear in the next report.

Changes since September 11, 2019:

- The report adds results for five new participants: Awidit Systems (Awiros), Momemtum Digital (Sertis), Trueface AI, Shanghai Jiao Tong University, and X-Laboratory.
- The reports adds results for five new algorithms from returning developers: Cyberlink, Hengrui AI Technology, Idemia, Panasonic R+D Singapore, and Tevian. This causes three algorithm, to be de-listed from the report per policy to list results for two algorithms per developer.

Changes since July 31 2019:

- ▷ The HTML table on the FRVT 1:1 homepage has been updated to include a column for cross-domain Visa-Border verification. Results for this new dataset appeared in the July 29 report under the name "CrossEV" - these are now renamed "Visa-Border".
- ▷ The FRVT 1:1 homepage lists algorithms according to lowest mean rank accuracy:
  Rank($\text{FNMR}_{\text{VISA}}$ at FMR = 0.000001) +
  Rank($\text{FNMR}_{\text{VISA-BORDER}}$ at FMR = 0.000001) +
  Rank($\text{FNMR}_{\text{MUGSHOT}}$ at FMR = 0.00001 after 14 years) +
  Rank($\text{FNMR}_{\text{WILD}}$ at FMR = 0.00001)
  This ordering rewards high accuracy across all datasets.
- ▷ The main results in Table 84 is now in landscape format to accomodate extra columns for the Visa-Border set, and mugshot comparisons after at least 12 years.
- ▷ The report adds results for nine new participants: Alpha SSTG, Intel Research, ULSee, Chungwa Telecon, iSAP Solution, Rokid, Shenzhen EI Networks, CSA Intellicloud, Shenzhen Intellifusion Technologies.
- ▷ The reports adds results for six new algorithms from returning developers: Innovatrics, Dahua Technology, Tech5 SA, Intellivision, Nodeflux and Imperial College, London. One algorithm, from Imperial has been retired, per policy to list results for two algorithms per developer.
- ▷ The cross-country false match rate heatmaps have been replotted to reveal more structure by listing countries by region instead of alphabetically.
- ▷ The next version of this report will be posted around October 18, 2019.

Changes since July 3 2019:

- ▷ The HTML table on the FRVT 1:1 homepage has been updated to list the 20 most accurate developers rather than algorithms, choosing the most accurate algorithm from each developer based on visa and mugshot results. Also, the algorithms are ordered in terms of lowest mean rank across mugshot, visa and wild datasets, rewarding broad accuracy over a good result on one particular dataset.
- ▷ This report includes results for a new dataset - see the column labelled "visa-border" in Table 5. It compares a new set of high quality visa-like portraits with a set webcam border-crossing photos that exhibit moderately poor pose variations and background illumination. The two new sets are described in sections 2.2 and 2.4. The comparisons are "cross-domain" in that the algorithm must compare "visa" and "wild" images. Results for other algorithms will be added in future reports as they become available.
- ▷ This report adds results for algorithms from 9 developers submitted in early July 2019. These are from 3DiVi, Camvi, EverAI-Paravision, Facesoft, Farbar (F8), Institute of Information Technologies, Shanghai U. Film Academy, Via Technologies, and Ulucu Electronics Tech. Six of these are new participants.
- ▷ Several other algorithms have been submitted and are being evaluated. Results will be released in the next report, scheduled for September 5. That report will include results for new datasets.
- ▷ Older algorithms from Everai, Camvi and 3DiVi, have been retired, per the policy to list only two algorithms per developer.

Changes since June 20 2019:

- ▷ This report adds results for algorithms from 18 developers submitted in early June 2019. These are from CTBC Bank, Deep Glint, Thales Cogent, Ever AI Paravision, Gorilla Technology, Imagus, Incode, Kneron, N-Tech Lab, Neurotechnology, Notiontag Technologies, Star Hybrid, Videonetics, Vigilant Solutions, Winsense, Anke Investments, CEIEC, and DSK. Nine of these are new participants.
- ▷ Several other algorithms have been submitted and are being evaluated. Results will be released in the next report, scheduled for August 1.
- ▷ Older algorithms from Everai, Thales Cogent, Gorilla Technology, Incode, Neurotechnology, N-Tech Lab and Vigilant Solutions have been retired, per the policy to list only two algorithms per developer.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Changes since April 2019:

- This report adds results for nine algorithms from nine developers submitted in early June 2019. These are from Tencent Deepsea, Hengrui, Kedacom, Moontime, Guangzhou Pixel, Rank One Computing, Synesis, Sensetime and Vocord.
- Another 23 algorithms have been submitted and are being evaluated. Results will be released in the next report, scheduled for July 3.
- Older algorithms for Rank One, Synesis, and Vocord have been retired, per the policy to list only two algorithms per developer.

Changes since February 2019:

- This report adds results for 49 algorithms from 42 developers submitted in early March 2019.
- This report omits results for algorithms that we retired. We retired for three reasons: 1. The developer submitted a new algorithm, and we only list two. 2. The algorithm needs a GPU, and we no longer allow GPU-based algorithms. 3. Inoperable algorithms.
- Previous results for retired algorithms are available in older editions of this report linked here.
- The mugshot database used from February 2017 to January 2019 has been replaced with an extract of the mugshot database documented in NIST Interagency Report 8238, November 2018. The new mugshot set is described in section 2.5 and is adopted because:
  - It has much better identity label integrity, so that false non-match rates are substantially lower than those reported in FRVT 1:1 reports to date - see Figure 278.
  - It includes images collected over a 17 year period such that ageing can be much better characterized - - see Figure 767.
- Using the new mugshot database, Figure 767 shows accuracy for four demographic groups identified in the biographic metadata that accompanies the data: black females, black males, white females and white males.
- The report added a figure (now moved to web) with results for the twenty human-difficult pairs used in the May 2018 paper *Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms* by Phillips et al. [1].
- The report uses an update to the wild image database that corrects some ground truth labels.
- Some results for the child exploitation database are not complete. They are typically updated less frequently than for other image sets.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

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FMR(T) "False match rate"

698 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 856
699 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 857
700 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 858
701 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 859
702 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 860
703 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 861
704 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 862
705 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 863
706 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 864
707 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 865
708 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 866
709 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 867
710 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 868
711 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 869
712 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 870
713 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 871
714 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 872
715 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 873
716 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 874
717 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 875
718 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 876
719 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 877
720 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 878
721 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 879
722 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 880
723 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 881
724 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 882
725 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 883
726 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 884
727 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 885
728 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 886
729 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 887
730 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 888
731 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 889
732 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 890
733 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 891
734 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 892
735 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 893
736 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 894
737 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 895
738 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 896
739 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 897
740 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 898
741 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 899
742 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 900
743 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 901
744 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 902
745 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 903
746 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 904
747 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 905
748 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 906
749 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 907
750 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 908
751 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 909
752 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 910
753 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 911
754 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES 912

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

755 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 913
756 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 914
757 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 915
758 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 916
759 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 917
760 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 918
761 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 919
762 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 920
763 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 921
764 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 922
765 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 923
766 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 924
767 ERROR TRADEOFF CHARACTERISTIC: MUGSHOT IMAGES . . . 925
768 EFFECT OF SUBJECT AGE ON FNMR . . . 927
769 EFFECT OF SUBJECT AGE ON FNMR . . . 928
770 EFFECT OF SUBJECT AGE ON FNMR . . . 929
771 EFFECT OF SUBJECT AGE ON FNMR . . . 930
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775 EFFECT OF SUBJECT AGE ON FNMR . . . 934
776 EFFECT OF SUBJECT AGE ON FNMR . . . 935
777 EFFECT OF SUBJECT AGE ON FNMR . . . 936
778 EFFECT OF SUBJECT AGE ON FNMR . . . 937
779 EFFECT OF SUBJECT AGE ON FNMR . . . 938
780 EFFECT OF SUBJECT AGE ON FNMR . . . 939
781 EFFECT OF SUBJECT AGE ON FNMR . . . 940
782 EFFECT OF SUBJECT AGE ON FNMR . . . 941
783 EFFECT OF SUBJECT AGE ON FNMR . . . 942
784 EFFECT OF SUBJECT AGE ON FNMR . . . 943
785 EFFECT OF SUBJECT AGE ON FNMR . . . 944
786 EFFECT OF SUBJECT AGE ON FNMR . . . 945
787 EFFECT OF SUBJECT AGE ON FNMR . . . 946
788 EFFECT OF SUBJECT AGE ON FNMR . . . 947
789 EFFECT OF SUBJECT AGE ON FNMR . . . 948
790 EFFECT OF SUBJECT AGE ON FNMR . . . 949
791 EFFECT OF SUBJECT AGE ON FNMR . . . 950
792 EFFECT OF SUBJECT AGE ON FNMR . . . 951
793 EFFECT OF SUBJECT AGE ON FNMR . . . 952
794 EFFECT OF SUBJECT AGE ON FNMR . . . 953
795 EFFECT OF SUBJECT AGE ON FNMR . . . 954
796 EFFECT OF SUBJECT AGE ON FNMR . . . 955
797 EFFECT OF SUBJECT AGE ON FNMR . . . 956
798 EFFECT OF SUBJECT AGE ON FNMR . . . 957
799 EFFECT OF SUBJECT AGE ON FNMR . . . 958
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801 EFFECT OF SUBJECT AGE ON FNMR . . . 960
802 EFFECT OF SUBJECT AGE ON FNMR . . . 961
803 EFFECT OF SUBJECT AGE ON FNMR . . . 962
804 EFFECT OF SUBJECT AGE ON FNMR . . . 963
805 EFFECT OF SUBJECT AGE ON FNMR . . . 964
806 EFFECT OF SUBJECT AGE ON FNMR . . . 965
807 EFFECT OF SUBJECT AGE ON FNMR . . . 966

808 EFFECT OF SUBJECT AGE ON FNMR . . . 967
809 EFFECT OF SUBJECT AGE ON FNMR . . . 968
810 EFFECT OF SUBJECT AGE ON FNMR . . . 969
811 EFFECT OF SUBJECT AGE ON FNMR . . . 970
812 EFFECT OF SUBJECT AGE ON FNMR . . . 971
813 EFFECT OF SUBJECT AGE ON FNMR . . . 972
814 EFFECT OF SUBJECT AGE ON FNMR . . . 973
815 EFFECT OF SUBJECT AGE ON FNMR . . . 974
816 EFFECT OF SUBJECT AGE ON FNMR . . . 975
817 EFFECT OF SUBJECT AGE ON FNMR . . . 976
818 EFFECT OF SUBJECT AGE ON FNMR . . . 977
819 EFFECT OF SUBJECT AGE ON FNMR . . . 978
820 EFFECT OF SUBJECT AGE ON FNMR . . . 979
821 EFFECT OF SUBJECT AGE ON FNMR . . . 980
822 EFFECT OF SUBJECT AGE ON FNMR . . . 981
823 EFFECT OF SUBJECT AGE ON FNMR . . . 982
824 EFFECT OF SUBJECT AGE ON FNMR . . . 983
825 EFFECT OF SUBJECT AGE ON FNMR . . . 984
826 EFFECT OF SUBJECT AGE ON FNMR . . . 985
827 EFFECT OF SUBJECT AGE ON FNMR . . . 986
828 EFFECT OF SUBJECT AGE ON FNMR . . . 987
829 EFFECT OF SUBJECT AGE ON FNMR . . . 988
830 EFFECT OF SUBJECT AGE ON FNMR . . . 989
831 EFFECT OF SUBJECT AGE ON FNMR . . . 990
832 EFFECT OF SUBJECT AGE ON FNMR . . . 991
833 EFFECT OF SUBJECT AGE ON FNMR . . . 992
834 EFFECT OF SUBJECT AGE ON FNMR . . . 993
835 EFFECT OF SUBJECT AGE ON FNMR . . . 994
836 EFFECT OF SUBJECT AGE ON FNMR . . . 995
837 EFFECT OF SUBJECT AGE ON FNMR . . . 996
838 EFFECT OF SUBJECT AGE ON FNMR . . . 997
839 EFFECT OF SUBJECT AGE ON FNMR . . . 998
840 EFFECT OF SUBJECT AGE ON FNMR . . . 999
841 EFFECT OF SUBJECT AGE ON FNMR . . . 1000
842 EFFECT OF SUBJECT AGE ON FNMR . . . 1001
843 EFFECT OF SUBJECT AGE ON FNMR . . . 1002
844 EFFECT OF SUBJECT AGE ON FNMR . . . 1003
845 EFFECT OF SUBJECT AGE ON FNMR . . . 1004
846 EFFECT OF SUBJECT AGE ON FNMR . . . 1005
847 EFFECT OF SUBJECT AGE ON FNMR . . . 1006
848 EFFECT OF SUBJECT AGE ON FNMR . . . 1007
849 EFFECT OF SUBJECT AGE ON FNMR . . . 1008
850 EFFECT OF SUBJECT AGE ON FNMR . . . 1009
851 EFFECT OF SUBJECT AGE ON FNMR . . . 1010
852 EFFECT OF SUBJECT AGE ON FNMR . . . 1011
853 EFFECT OF SUBJECT AGE ON FNMR . . . 1012
854 EFFECT OF SUBJECT AGE ON FNMR . . . 1013
855 EFFECT OF SUBJECT AGE ON FNMR . . . 1014
856 EFFECT OF SUBJECT AGE ON FNMR . . . 1015
857 EFFECT OF SUBJECT AGE ON FNMR . . . 1016
858 EFFECT OF SUBJECT AGE ON FNMR . . . 1017

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

859 IMPOSTOR COUNTS FOR CROSS COUNTRY FMR CALCULATIONS 1021

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
1	KR	Urielsoft Co. Ltd	urielsoft-000	000	2025-06-30
2	EE	2060.io	2060io-001	001	2025-01-22
3	EE	2060.io	2060io-002	002	2025-07-23
4	NL	20Face	20face-000	000	2021-04-12
5	NL	20Face	20face-001	001	2021-09-29
6	US	3Divi	3divi-000	000	2017-03-16
7	US	3Divi	3divi-001	001	2017-06-22
8	US	3Divi	3divi-002	002	2017-10-20
9	US	3Divi	3divi-003	003	2018-10-09
10	US	3Divi	3divi-004	004	2019-07-22
11	US	3Divi	3divi-005	005	2020-08-28
12	US	3Divi	3divi-006	006	2021-04-14
13	US	3Divi	3divi-007	007	2021-09-27
14	TH	ACI Software	acisw-003	003	2020-08-03
15	TH	ACI Software	acisw-006	006	2021-02-25
16	TH	ACI Software	acisw-007	007	2021-11-15
17	TH	ACI Software	acisw-008	008	2022-03-22
18	US	AFIS and Biometrics Consulting	afisbiometrics-000	000	2022-01-27
19	US	AFR Engine	afrengine-000	000	2022-09-29
20	US	AFR Engine	afrengine-001	001	2023-01-26
21	US	AFR Engine	afrengine-002	002	2023-06-27
22	US	AFR Engine	afrengine-003	003	2024-03-15
23	US	AFR Engine	afrengine-004	004	2024-07-22
24	US	AFR Engine	afrengine-005	005	2025-02-18
25	UZ	AI Implementation Group	aigroup-000	000	2024-07-17
26	UZ	AI Implementation Group	aigroup-001	001	2025-02-18
27	VN	ALTTEKGlobal	alttekglobal-000	000	2024-04-12
28	TW	ASUSTek Computer Inc	asusaics-000	000	2019-10-24
29	TW	ASUSTek Computer Inc	asusaics-001	001	2020-02-25
30	CN	AYF Technology	ayftech-001	001	2020-07-06
31	CN	AYF Technology	ayftech-003	003	2023-05-15
32	TW	Ability Enterprise - Andro Video	androvideo-000	000	2021-01-25
33	IN	Accurascan	accurascan-001	001	2023-0-15
34	IN	Accurascan	accurascan-002	002	2023-08-01
35	IN	Accurascan	accurascan-003	003	2023-12-06
36	TW	Acer Incorporated	acer-000	000	2020-01-08
37	TW	Acer Incorporated	acer-001	001	2020-06-30
38	TW	Acer Incorporated	acer-002	002	2021-11-10
39	SG	Adera Global PTE	adera-001	001	2019-06-17
40	SG	Adera Global PTE	adera-002	002	2021-02-16
41	SG	Adera Global PTE	adera-003	003	2021-07-12
42	SG	Adera Global PTE	adera-004	004	2022-11-14
43	SG	Adera Global PTE	adera-005	005	2023-11-17
44	SG	Advance.AI	advance-002	002	2019-12-19
45	SG	Advance.AI	advance-003	003	2021-08-05
46	SG	Advance.AI	advance-004	004	2022-09-06
47	SG	Advance.AI	advance-005	005	2023-05-25
48	AE	Affinsys AI Ltd	affinsys-ai-000	000	2024-07-11
49	TH	Ai First	aifirst-001	001	2019-11-21
50	TW	AiUnion Technology	aiunionface-000	000	2019-10-22
51	TH	Aigen	aigen-001	001	2020-10-06
52	TH	Aigen	aigen-002	002	2021-03-15
53	CN	Aiseemu Technology	aiseemu-001	001	2022-06-16
54	CN	Aiseemu Technology	aiseemu-002	002	2022-11-18
55	KR	Ajou University	ajou-001	001	2021-03-08
56	ID	Akurat Satu Indonesia	ptakuratsatu-000	000	2020-09-11
57	KR	Alchera Inc	alchera-000	000	2019-03-01
58	KR	Alchera Inc	alchera-001	001	2019-03-01
59	KR	Alchera Inc	alchera-002	002	2021-03-05
60	KR	Alchera Inc	alchera-003	003	2021-07-13
61	KR	Alchera Inc	alchera-004	004	2022-08-12
62	KR	Alchera Inc	alchera-005	005	2023-01-04
63	KR	Alchera Inc	alchera-006	006	2023-07-18
64	KR	Alchera Inc	alchera-007	007	2023-11-22
65	KR	Alchera Inc	alchera-008	008	2024-06-17
66	KR	Alchera Inc	alchera-009	009	2024-11-14
67	ID	Alfabeta	alfabeta-001	001	2021-12-02
68	ES	Alice Biometrics	alice-000	000	2021-06-15
69	ES	Alice Biometrics	alice-001	001	2023-07-05
70	RU	Alivia / Innovation Sys	isystems-000	000	2018-01-11

Table 1: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
71	RU	Alivia / Innovation Sys	isystems-001	001	2018-06-12
72	RU	Alivia / Innovation Sys	isystems-002	002	2018-10-18
73	IN	AllGoVision	allgovision-000	000	2019-03-01
74	CN	AlphaSSTG	alphaface-001	001	2019-09-03
75	CN	AlphaSSTG	alphaface-002	002	2020-02-20
76	GB	Amplified Group	amplifiedgroup-001	001	2019-03-01
77	CN	Anke Investments	anke-000	000	2018-06-26
78	CN	Anke Investments	anke-001	001	2018-06-26
79	CN	Anke Investments	anke-002	002	2018-10-19
80	CN	Anke Investments	anke-003	003	2019-02-27
81	CN	Anke Investments	anke-004	004	2019-06-27
82	CN	Anke Investments	anke-005	005	2019-11-21
83	BR	Antheus Technologia	antheus-000	000	2019-12-05
84	BR	Antheus Technologia	antheus-001	001	2020-06-25
85	BR	Antheus Technologia	antheus-002	002	2024-07-15
86	GB	AnyVision	anyvision-001	001	2018-01-31
87	GB	AnyVision	anyvision-002	002	2018-01-31
88	GB	AnyVision	anyvision-004	004	2018-06-15
89	GB	AnyVision	anyvision-005	005	2021-02-03
90	TR	ArVİs Teknoloji San.Tic.A.Ş.	arvis-000	000	2025-04-08
91	CN	Aratek Biometrics Co Ltd	aratek-001	001	2023-03-27
92	US	Armatura LLC	armatura-001	001	2022-01-04
93	US	Armatura LLC	armatura-002	002	2022-09-16
94	US	Armatura LLC	armatura-003	003	2023-01-13
95	CN	AuthenMetric	authenmetric-002	002	2021-03-10
96	CN	AuthenMetric	authenmetric-003	003	2021-08-09
97	CN	AuthenMetric	authenmetric-004	004	2022-01-03
98	TW	Authme	authme-001	001	2023-10-17
99	TW	Authme	authme-002	002	2025-02-10
100	US	Aware	aware-000	000	2017-10-27
101	US	Aware	aware-001	001	2017-10-27
102	US	Aware	aware-002	002	2018-06-15
103	US	Aware	aware-003	003	2018-10-19
104	US	Aware	aware-004	004	2019-03-01
105	US	Aware	aware-005	005	2020-02-27
106	US	Aware	aware-006	006	2021-07-03
107	US	Aware	aware-007	007	2023-11-15
108	US	Aware	aware-008	008	2024-03-15
109	IN	Awidit Systems	awiros-001	001	2019-09-23
110	IN	Awidit Systems	awiros-002	002	2020-10-28
111	IN	Awidit Systems	awiros-003	003	2024-11-01
112	IN	Awidit Systems	awiros-004	004	2025-03-31
113	CH	Aximetria	aximetria-001	001	2022-08-10
114	JP	Ayonix	ayonix-000	000	2017-06-22
115	CN	BOE Technology Group	boetech-001	001	2021-06-22
116	CN	BOE Technology Group	boetech-002	002	2021-12-21
117	KZ	BTS Digital	btsdigital-001	001	2025-07-31
118	ES	Bee the Data	beethedata-000	000	2021-07-26
119	CN	Beihang University-ERCACAT	ercacat-001	001	2020-07-06
120	CN	Beijing Alleyes Technology	alleyes-000	000	2020-03-09
121	CN	Beijing DeepSense Technologies	deepsense-000	000	2021-03-19
122	CN	Beijing DeepSense Technologies	deepsense-001	001	2022-03-11
123	CN	Beijing DeepSense Technologies	deepsense-002	002	2023-02-22
124	CN	Beijing DeepSense Technologies	deepsense-003	003	2023-10-23
125	CN	Beijing DeepSense Technologies	deepsense-004	004	2024-06-21
126	CN	Beijing DeepSense Technologies	deepsense-005	005	2024-10-28
127	CN	Beijing DeepSense Technologies	deepsense-006	006	2025-03-07
128	CN	Beijing DeepSense Technologies	deepsense-007	007	2025-07-08
129	CN	Beijing DeepSense Technologies	deepsense-008	008	2026-01-13
130	CN	Beijing Hisign Technology	hisign-001	001	2021-09-24
131	CN	Beijing Hisign Technology	hisign-002	002	2022-09-09
132	CN	Beijing Hisign Technology	hisign-003	003	2024-03-15
133	CN	Beijing Mendaxia Technology	mendaxiatech-000	000	2021-09-15
134	CN	Beijing Vion Technology Inc	vion-000	000	2018-10-19
135	DE	Betaface	betaface-000	000	2018-05-29
136	DE	Betaface	betaface-002	002	2018-05-29
137	KZ	Beyne.AI	beyneai-000	000	2022-01-03
138	DE	BioID GmbH	bioid-001	001	2024-11-13
139	DE	BioID GmbH	bioid-002	002	2025-04-25
140	CNE	BioID GmbH	bioid-003	003	2025-11-26

Table 2: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
141	CH	BioID Technologies SA	bioidtechswiss-000	000	2019-11-15
142	CH	BioID Technologies SA	bioidtechswiss-001	001	2020-08-28
143	CH	BioID Technologies SA	bioidtechswiss-002	002	2021-02-17
144	CH	BioID Technologies SA	bioidtechswiss-003	003	2025-03-12
145	IN	Biocube Matrics	biocube-001	001	2021-09-08
146	IN	Biocube Matrics	biocube-002	002	2023-02-09
147	KZ	Biometric LLC	biometric-vision-000	000	2023-01-25
148	ID	Biometrik Systems Private Limited	biometrik-001	001	2025-09-18
149	UK	BitCenter UK	farfaces-001	001	2021-04-09
150	CN	Bitmain	bm-001	001	2018-10-17
151	CN	Bresee Technology	bresee-000	000	2020-08-07
152	CN	Bresee Technology	bresee-001	001	2020-12-30
153	CN	Bresee Technology	bresee-002	002	2021-06-30
154	VN	CAKE by VPBank	cakevn-001	001	2026-01-12
155	VN	CMC Institute of Science and Technology	cist-001	001	2022-10-20
156	VN	CMC Institute of Science and Technology	cist-002	002	2023-02-09
157	VN	CMC Institute of Science and Technology	cist-003	003	2023-08-14
158	VN	CMC Institute of Science and Technology	cist-004	004	2024-02-15
159	VN	CMC Univerisity	cmcuni-001	001	2023-12-05
160	CN	CSA IntelliCloud Technology	intellicloudai-001	001	2019-08-13
161	CN	CSA IntelliCloud Technology	intellicloudai-002	002	2020-12-17
162	TW	CTBC Bank	ctbcbank-000	000	2019-06-28
163	TW	CTBC Bank	ctbcbank-001	001	2019-10-28
164	TW	CTBC Bank	ctbcbank-002	002	2024-07-10
165	KR	CUDO Communication	cudocommunication-001	001	2021-10-20
166	US	Camvi Technologies	camvi-001	001	2017-09-13
167	US	Camvi Technologies	camvi-002	002	2018-10-19
168	US	Camvi Technologies	camvi-003	003	2019-03-01
169	US	Camvi Technologies	camvi-004	004	2019-07-12
170	FI	Candour Biometrics	candour-001	001	2023-02-10
171	FI	Candour Biometrics	candour-002	002	2024-03-07
172	FI	Candour Biometrics	candour-003	003	2024-10-23
173	FI	Candour Biometrics	candour-004	004	2026-01-08
174	CN	Canon Inc	canon-002	002	2020-12-29
175	JP	Canon Inc	canon-003	003	2021-09-15
176	JP	Canon Inc	canon-004	004	2022-04-25
177	JP	Canon Inc	canon-005	005	2023-09-05
178	CN	Canon Inc	cib-000	000	2019-12-11
179	CN	Canon Inc	cib-001	001	2020-08-05
180	BD	Celloscope Limited	celloscope-001	001	2024-07-15
181	CN	China Electronics Import-Export Corp	ceiec-001	001	2019-03-01
182	CN	China Electronics Import-Export Corp	ceiec-002	002	2019-06-12
183	CN	China Electronics Import-Export Corp	ceiec-003	003	2020-01-06
184	CN	China Electronics Import-Export Corp	ceiec-004	004	2021-01-18
185	CN	China University of Petroleum	upc-001	001	2019-06-05
186	CN	Chinese University of Hong Kong	cuhkee-001	001	2020-03-18
187	KR	Chosun University	chosun-000	000	2020-02-12
188	KR	Chosun University	chosun-001	001	2020-07-01
189	KR	Chosun University	chosun-002	002	2020-11-25
190	TW	Chunghwa Telecom	chtface-001	001	2019-08-06
191	TW	Chunghwa Telecom	chtface-002	002	2019-12-07
192	TW	Chunghwa Telecom	chtface-003	003	2020-06-24
193	TW	Chunghwa Telecom	chtface-004	004	2021-10-08
194	TW	Chunghwa Telecom	chtface-005	005	2022-03-09
195	TW	Chunghwa Telecom	chtface-006	006	2022-11-03
196	TW	Chunghwa Telecom	chtface-007	007	2024-04-23
197	TW	Chunghwa Telecom	chtface-008	008	2024-09-27
198	TW	Chunghwa Telecom	chtface-009	009	2025-10-21
199	US	City and County of Honolulu	cchonolulu-000	000	2023-03-27
200	US	City and County of Honolulu	cchonolulu-001	001	2024-01-18
201	US	Clearview AI Inc	clearviewai-000	000	2021-09-22
202	US	Clearview AI Inc	clearviewai-001	001	2023-12-05
203	US	Clearview AI Inc	clearviewai-002	002	2024-05-22
204	US	Clearview AI Inc	clearviewai-003	003	2026-01-09
205	CN	Closeli Inc	closeli-001	001	2021-07-15
206	US	CloudSmart Consulting LLC	csc-001	001	2020-11-20
207	US	CloudSmart Consulting LLC	csc-002	002	2021-03-24
208	US	CloudSmart Consulting LLC	csc-003	003	2021-08-26
209	TW	Cloudmatrix	cloudmatrix-000	000	2021-10-22
210	TW	Cloudmatrix	cloudmatrix-001	001	2022-02-16

Table 3: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
211	TW	Cloudmatrix	cloudmatrix-002	002	2022-10-17
212	CN	Cloudwalk - Hengrui AI Technology	cloudwalk-hr-000	000	2019-03-01
213	CN	Cloudwalk - Hengrui AI Technology	cloudwalk-hr-001	001	2019-06-04
214	CN	Cloudwalk - Hengrui AI Technology	cloudwalk-hr-002	002	2019-10-08
215	CN	Cloudwalk - Hengrui AI Technology	cloudwalk-hr-003	003	2020-09-25
216	CN	Cloudwalk - Hengrui AI Technology	cloudwalk-hr-004	004	2021-02-10
217	CN	Cloudwalk - Moontime Smart Technology	cloudwalk-mt-000	000	2019-06-03
218	CN	Cloudwalk - Moontime Smart Technology	cloudwalk-mt-002	002	2020-07-02
219	CN	Cloudwalk - Moontime Smart Technology	cloudwalk-mt-003	003	2020-12-22
220	CN	Cloudwalk - Moontime Smart Technology	cloudwalk-mt-004	004	2021-11-09
221	CN	Cloudwalk - Moontime Smart Technology	cloudwalk-mt-005	005	2022-03-29
222	CN	Cloudwalk - Moontime Smart Technology	cloudwalk-mt-006	006	2022-10-20
223	CN	Cloudwalk - Moontime Smart Technology	cloudwalk-mt-007	007	2023-02-21
224	IN	Code Everest Pvt	facex-001	001	2021-03-08
225	IN	Code Everest Pvt	facex-002	002	2021-08-24
226	KR	Codeline	codeline-000	000	2022-09-13
227	DE	Cognitec Systems GmbH	cognitec-000	000	2018-10-19
228	DE	Cognitec Systems GmbH	cognitec-001	001	2019-03-01
229	DE	Cognitec Systems GmbH	cognitec-002	002	2021-02-24
230	DE	Cognitec Systems GmbH	cognitec-003	003	2021-07-30
231	DE	Cognitec Systems GmbH	cognitec-004	004	2022-02-10
232	DE	Cognitec Systems GmbH	cognitec-005	005	2023-12-01
233	DE	Cognitec Systems GmbH	cognitec-006	006	2024-04-29
234	DE	Cognitec Systems GmbH	cognitec-007	007	2024-08-29
235	TW	Compal Electronics	compal-000	000	2025-03-20
236	TW	Compal Electronics	compal-001	001	2025-12-08
237	TW	Coretech Knowledge Inc	coretech-000	000	2021-07-12
238	TW	Coretech Knowledge Inc	coretech-001	001	2022-09-29
239	TW	Coretech Knowledge Inc	coretech-002	002	2023-11-02
240	TW	Coretech Knowledge Inc	coretech-003	003	2024-08-07
241	TW	Coretech Knowledge Inc	coretech-004	004	2024-12-23
242	IL	Corsight	corsight-001	001	2021-03-11
243	IL	Corsight	corsight-002	002	2021-09-01
244	IL	Corsight	corsight-003	003	2022-06-09
245	IL	Cortica	cor-001	001	2020-09-24
246	TW	Cu-Face	cu-face-002	002	2023-01-05
247	TW	Cu-Face	cu-face-003	003	2023-08-28
248	TW	Cu-Face	cu-face-004	004	2024-03-13
249	KR	Cubox	cubox-001	001	2020-12-07
250	KR	Cubox	cubox-002	002	2021-08-24
251	KR	Cubox	cubox-003	003	2023-03-07
252	KR	Cubox	cubox-004	004	2024-12-05
253	KR	Cubox	cubox-005	005	2025-05-14
254	JP	Cybercore	cybercore-000	000	2020-08-26
255	JP	Cybercore	cybercore-001	001	2021-12-15
256	JP	Cybercore	cybercore-002	002	2022-04-25
257	JP	Cybercore	cybercore-003	003	2022-08-31
258	US	Cyberextruder	cyberextruder-001	001	2017-08-02
259	US	Cyberextruder	cyberextruder-002	002	2018-01-30
260	US	Cyberextruder	cyberextruder-003	003	2022-03-16
261	US	Cyberextruder	cyberextruder-004	004	2022-07-20
262	US	Cyberextruder	cyberextruder-005	005	2024-10-01
263	US	Cyberextruder	cyberextruder-006	006	2025-03-19
264	TW	Cyberlink Corp	cyberlink-000	000	2019-03-01
265	TW	Cyberlink Corp	cyberlink-001	001	2019-03-01
266	TW	Cyberlink Corp	cyberlink-002	002	2019-06-12
267	TW	Cyberlink Corp	cyberlink-003	003	2019-10-07
268	TW	Cyberlink Corp	cyberlink-004	004	2020-02-27
269	TW	Cyberlink Corp	cyberlink-005	005	2020-07-31
270	TW	Cyberlink Corp	cyberlink-006	006	2021-01-08
271	TW	Cyberlink Corp	cyberlink-007	007	2021-07-16
272	TW	Cyberlink Corp	cyberlink-008	008	2022-01-07
273	TW	Cyberlink Corp	cyberlink-009	009	2022-05-12
274	TW	Cyberlink Corp	cyberlink-010	010	2022-09-16
275	TW	Cyberlink Corp	cyberlink-011	011	2023-01-30
276	TW	Cyberlink Corp	cyberlink-012	012	2023-06-02
277	TW	Cyberlink Corp	cyberlink-013	013	2023-12-15
278	TW	Cyberlink Corp	cyberlink-014	014	2024-05-23
279	TW	Cyberlink Corp	cyberlink-015	015	2024-09-26
280	MX	DICIO	dicio-001	001	2022-03-22

Table 4: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
281	MX	DICIO	dicio-002	002	2024-10-03
282	CN	DSK	dsk-000	000	2019-06-28
283	VN	Dactionable Technologies	datech-000	000	2023-10-16
284	VN	Dactionable Technologies	datech-001	001	2024-02-21
285	VN	Dactionable Technologies	datech-002	002	2024-09-11
286	CN	Dahua Technology	dahua-000	000	2018-10-19
287	CN	Dahua Technology	dahua-001	001	2018-10-19
288	CN	Dahua Technology	dahua-002	002	2019-03-01
289	CN	Dahua Technology	dahua-003	003	2019-08-14
290	CN	Dahua Technology	dahua-004	004	2019-12-18
291	CN	Dahua Technology	dahua-005	005	2020-08-13
292	CN	Dahua Technology	dahua-006	006	2020-12-30
293	CN	Dahua Technology	dahua-007	007	2021-12-20
294	IE	Daon	daon-000	000	2021-11-03
295	IE	Daon	daon-001	001	2024-09-26
296	IE	Daon	daon-002	002	2025-07-01
297	TW	DeCloak Intellegences	decloakface-001	001	2023-06-13
298	TW	DeCloak Intellegences	decloakface-002	002	2024-10-28
299	US	Decatur Industries Inc	decatur-000	000	2020-08-18
300	US	Decatur Industries Inc	decatur-001	001	2021-09-27
301	CN	Deepglint	deepglint-001	001	2019-06-21
302	CN	Deepglint	deepglint-002	002	2019-11-15
303	CN	Deepglint	deepglint-003	003	2021-03-03
304	CN	Deepglint	deepglint-004	004	2021-09-17
305	CN	Deepglint	deepglint-005	005	2022-10-17
306	FR	Deepsense	dps-000	000	2021-07-16
307	DE	Dermalog	dermalog-001	001	2017-02-22
308	DE	Dermalog	dermalog-002	002	2017-02-22
309	DE	Dermalog	dermalog-003	003	2017-07-10
310	DE	Dermalog	dermalog-004	004	2017-10-26
311	DE	Dermalog	dermalog-005	005	2018-02-02
312	DE	Dermalog	dermalog-006	006	2018-10-18
313	DE	Dermalog	dermalog-007	007	2020-11-25
314	DE	Dermalog	dermalog-008	008	2021-03-25
315	DE	Dermalog	dermalog-009	009	2021-10-06
316	DE	Dermalog	dermalog-010	010	2022-07-25
317	DE	Dermalog	dermalog-011	011	2022-12-12
318	DE	Dermalog	dermalog-012	012	2024-01-19
319	DE	Dermalog	dermalog-013	013	2024-06-18
320	DE	Dermalog	dermalog-014	014	2025-06-17
321	DE	Dermalog	dermalog-015	015	2025-11-26
322	CN	DiDi ChuXing Technology	didiglobalface-001	001	2019-10-23
323	CN	DiDi ChuXing Technology	didiglobalface-002	002	2023-01-09
324	CN	DiDi ChuXing Technology	didiglobalface-003	003	2025-05-01
325	IN	Digidata	digidata-000	000	2022-01-27
326	IN	Digidata	digidata-001	001	2022-06-10
327	GB	Digital Barriers	digitalbarriers-000	000	2017-05-31
328	GB	Digital Barriers	digitalbarriers-001	001	2017-07-20
329	GB	Digital Barriers	digitalbarriers-002	002	2019-03-01
330	IN	EI Networks Private Ltd	einetworksindia-000	000	2023-05-03
331	IN	EI Networks Private Ltd	einetworksindia-001	001	2023-09-05
332	IN	EI Networks Private Ltd	einetworksindia-002	002	2025-02-21
333	TR	Ekin Smart City Technologies	ekin-002	002	2021-05-04
334	TH	Element System Solutions Company Ltd	element-000	000	2023-11-14
335	AE	Enface	enface-000	000	2021-04-09
336	AE	Enface	enface-001	001	2021-12-17
337	AE	Enface	enface-002	002	2023-02-27
338	GB	Enqura Ltd	enqura-001	001	2024-09-25
339	CH	Euronovate SA	euronovate-001	001	2021-11-15
340	CH	Euronovate SA	euronovate-002	002	2023-06-28
341	CH	Euronovate SA	euronovate-003	003	2023-09-19
342	CH	Euronovate SA	euronovate-004	004	2024-01-19
343	RU	Expasoft LLC	expasoft-000	000	2020-01-06
344	RU	Expasoft LLC	expasoft-001	001	2020-09-03
345	RU	Expasoft LLC	expasoft-002	002	2021-07-26
346	VN	FCI Vietnam	fci-000	000	2025-04-01
347	LB	FOO	foomobi-001	001	2023-03-13
348	LB	FOO	foomobi-002	002	2023-08-07
349	VN	FPT Education	fedu-001	001	2024-03-15
350	VN	FPT Information System	fpt-000	000	2024-02-26

Table 5: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
351	VN	FPT Information System	fpt-001	001	2024-09-16
352	US	FRP LLC	frpkauai-001	001	2022-07-18
353	US	FRP LLC	frpkauai-002	002	2022-11-21
354	US	FRP LLC	frpkauai-003	003	2024-05-30
355	US	FRP LLC	frpkauai-004	004	2025-03-25
356	CA	FaceLocate	facelocate-001	001	2024-02-22
357	DE	FaceOnLive Inc	faceonlive-001	001	2021-11-23
358	DE	FaceOnLive Inc	faceonlive-002	002	2022-04-11
359	DE	FaceOnLive Inc	faceonlive-003	003	2024-08-12
360	ES	FacePhi	facephi-000	000	2022-04-06
361	ES	FacePhi	facephi-001	001	2024-05-24
362	ES	FacePhi	facephi-002	002	2025-02-11
363	GB	FaceSoft	facesoft-000	000	2019-07-10
364	KR	FaceTag Co	facetag-000	000	2021-03-22
365	KR	FaceTag Co	facetag-001	001	2021-08-17
366	KR	FaceTag Co	facetag-002	002	2022-01-06
367	UK	Facehawk Ltd	facehawk-000	000	2023-08-22
368	UK	Facia.ai	facia-001	001	2023-07-21
369	UK	Facia.ai	facia-002	002	2024-06-21
370	UK	FaiceTech Ltd	faicetech-000	000	2025-03-11
371	TW	FarBar Inc	f8-001	001	2019-07-11
372	TW	FarBar Inc	f8-002	002	2022-03-02
373	US	Fast Enterprises	fastenterprises-000	000	2023-03-01
374	CN	Fiberhome Telecommunication Technologies	fiberhome-nanjing-002	002	2020-08-10
375	CN	Fiberhome Telecommunication Technologies	fiberhome-nanjing-003	003	2021-03-12
376	CN	Fiberhome Telecommunication Technologies	fiberhome-nanjing-004	004	2021-09-14
377	UK	Fincore Ltd	fincore-000	000	2021-06-07
378	KZ	First Credit Bureau Kazakhstan	firstcreditkz-001	001	2022-08-22
379	KZ	First Credit Bureau Kazakhstan	firstcreditkz-002	002	2023-02-21
380	KZ	First Credit Bureau Kazakhstan	firstcreditkz-003	003	2024-02-20
381	KZ	First Credit Bureau Kazakhstan	firstcreditkz-004	004	2024-10-02
382	NL	Fourthline	fourthlinecom-001	001	2024-04-15
383	UK	Fraud.com	fraudcom-000	000	2023-12-01
384	CN	Fudan University	fdu-000	000	2017-11-22
385	CN	Fudan University	fdu-001	001	2018-01-11
386	CN	Fujitsu Research and Development Center	fujitsulab-000	000	2020-02-04
387	CN	Fujitsu Research and Development Center	fujitsulab-001	001	2020-09-30
388	CN	Fujitsu Research and Development Center	fujitsulab-002	002	2021-02-24
389	CN	Fujitsu Research and Development Center	fujitsulab-003	003	2021-07-12
390	VN	GPS Vietnam Trading	gpstechvn-000	000	2024-01-02
391	VN	GTEL OTS JSC	gtelots-000	000	2025-04-14
392	US	Gemalto Cogent	cogent-000	000	2018-01-12
393	US	Gemalto Cogent	cogent-001	001	2018-05-29
394	US	Gemalto Cogent	cogent-002	002	2018-10-19
395	US	Gemalto Cogent	cogent-003	003	2019-03-01
396	US	Gemalto Cogent	cogent-004	004	2019-06-14
397	US	Gemalto Cogent	cogent-005	005	2020-12-29
398	US	Gemalto Cogent	cogent-006	006	2021-07-28
399	US	Gemalto Cogent	cogent-007	007	2022-04-11
400	US	Gemalto Cogent	cogent-008	008	2023-01-03
401	TW	General Interface Solutions Holding Ltd	gistouch-000	000	2023-05-08
402	TW	General Interface Solutions Holding Ltd	gistouch-001	001	2023-11-09
403	TW	GeoVision Inc	geo-000	000	2020-06-29
404	TW	GeoVision Inc	geo-001	001	2020-10-30
405	TW	GeoVision Inc	geo-002	002	2021-04-01
406	TW	GeoVision Inc	geo-003	003	2021-09-15
407	TW	GeoVision Inc	geo-004	004	2022-02-10
408	JP	Glory	glory-000	000	2018-06-06
409	JP	Glory	glory-001	001	2018-06-08
410	JP	Glory	glory-002	002	2019-11-12
411	JP	Glory	glory-003	003	2021-01-15
412	JP	Glory	glory-004	004	2022-02-08
413	JP	Glory	glory-005	005	2022-07-08
414	JP	Glory	glory-006	006	2023-03-23
415	JP	Glory	glory-007	007	2023-11-10
416	TW	Gorilla Technology	gorilla-000	000	2018-02-13
417	TW	Gorilla Technology	gorilla-001	001	2018-05-25
418	TW	Gorilla Technology	gorilla-002	002	2018-10-17
419	TW	Gorilla Technology	gorilla-003	003	2019-06-19
420	TW	Gorilla Technology	gorilla-004	004	2019-11-04

Table 6: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
421	TW	Gorilla Technology	gorilla-005	005	2020-03-11
422	TW	Gorilla Technology	gorilla-006	006	2020-07-31
423	TW	Gorilla Technology	gorilla-007	007	2021-06-28
424	TW	Gorilla Technology	gorilla-008	008	2021-11-08
425	TW	Gorilla Technology	gorilla-009	009	2022-12-14
426	US	Graymatics	graymatics-001	001	2022-01-13
427	US	Griaule	griaule-000	000	2021-08-20
428	US	Griaule	griaule-001	001	2022-05-31
429	US	Griaule	griaule-002	002	2022-12-02
430	CN	Guangzhou Pixel Solutions	pixelall-002	002	2019-06-06
431	CN	Guangzhou Pixel Solutions	pixelall-003	003	2019-10-15
432	CN	Guangzhou Pixel Solutions	pixelall-004	004	2020-07-02
433	CN	Guangzhou Pixel Solutions	pixelall-005	005	2021-02-05
434	CN	Guangzhou Pixel Solutions	pixelall-006	006	2021-06-17
435	CN	Guangzhou Pixel Solutions	pixelall-007	007	2021-12-01
436	CN	Guangzhou Pixel Solutions	pixelall-008	008	2022-06-16
437	CN	Guangzhou Pixel Solutions	pixelall-009	009	2022-10-26
438	CN	Guangzhou Pixel Solutions	pixelall-010	010	2023-10-18
439	CN	Hangzhuo AIlu Network Information Technology	hzailu-001	001	2022-01-27
440	CN	Hangzhuo AIlu Network Information Technology	hzailu-002	002	2022-06-02
441	CN	Hangzhuo AIlu Network Information Technology	hzailu-003	003	2022-10-11
442	CN	Hangzhuo AIlu Network Information Technology	hzailu-004	004	2023-02-27
443	CN	Hangzhuo AIlu Network Information Technology	hzailu-005	005	2023-08-10
444	CN	Hangzhuo AIlu Network Information Technology	hzailu-006	006	2023-12-28
445	CN	Hangzhuo AIlu Network Information Technology	hzailu-007	007	2024-09-06
446	CN	Hangzhuo AIlu Network Information Technology	hzailu-008	008	2025-02-27
447	ES	Herta Security	hertasecurity-000	000	2021-01-05
448	ES	Herta Security	hertasecurity-001	001	2022-01-18
449	ES	Herta Security	hertasecurity-002	002	2022-09-02
450	ES	Herta Security	hertasecurity-003	003	2023-01-27
451	CN	Hikvision Research Institute	hik-001	001	2019-03-01
452	IN	Hyderabad-Centre for Development of Advanced Computing	cdachyd-001	001	2024-10-01
453	IN	HyperVerge Inc	hyperverge-001	001	2020-12-13
454	IN	HyperVerge Inc	hyperverge-002	002	2021-05-27
455	IN	HyperVerge Inc	hyperverge-003	003	2022-04-11
456	IN	HyperVerge Inc	hyperverge-004	004	2022-12-14
457	IN	HyperVerge Inc	hyperverge-005	005	2023-08-08
458	IN	HyperVerge Inc	hyperverge-006	006	2024-05-02
459	KR	Hyundai Motor Company	hyundai-roboticslab-000	000	2024-07-12
460	KR	Hyundai Motor Company	hyundai-roboticslab-001	001	2025-02-03
461	KR	Hyundai Motor Company	hyundai-roboticslab-002	002	2025-06-03
462	KR	Hyundai Motor Company	hyundai-roboticslab-003	003	2025-11-14
463	AU	ICM Airport Technics	icm-002	002	2020-11-13
464	AU	ICM Airport Technics	icm-003	003	2021-09-06
465	AU	ICM Airport Technics	icm-004	004	2022-09-07
466	AU	ICM Airport Technics	icm-005	005	2023-09-05
467	US	ID R&D Inc	idrnd-000	000	2024-07-26
468	US	ID R&D Inc	idrnd-001	001	2025-07-31
469	FR	ID3 Technology	id3-001	001	2017-08-04
470	FR	ID3 Technology	id3-002	002	2017-08-04
471	FR	ID3 Technology	id3-003	003	2018-10-05
472	FR	ID3 Technology	id3-004	004	2019-03-01
473	FR	ID3 Technology	id3-005	005	2020-08-04
474	FR	ID3 Technology	id3-006	006	2020-12-17
475	FR	ID3 Technology	id3-007	007	2021-05-17
476	FR	ID3 Technology	id3-008	008	2021-11-10
477	UK	IDENTY	identy-000	000	2023-04-04
478	UK	IDENTY	identy-001	001	2025-05-21
479	UK	IDENTY	identy-002	002	2025-11-14
480	KZ	IE SARSENOV	asr-000	000	2025-07-30
481	KZ	IE SARSENOV	asr-001	001	2025-12-01
482	CA	IMDS Software	imds-software-001	001	2022-07-06
483	CA	IMDS Software	imds-software-002	002	2023-02-10
484	CA	IMDS Software	imds-software-003	003	2023-06-20
485	MX	IQSEC	iqsec-001	001	2024-04-12
486	MX	IQSEC	iqsec-002	002	2025-01-08
487	RU	ITMO University	itmo-001	001	2017-06-12
488	RU	ITMO University	itmo-002	002	2017-08-07
489	RU	ITMO University	itmo-003	003	2018-01-23
490	RU	ITMO University	itmo-004	004	2018-06-13

Table 7: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
491	RU	ITMO University	itmo-005	005	2018-10-19
492	RU	ITMO University	itmo-006	006	2019-03-01
493	RU	ITMO University	itmo-007	007	2020-01-06
494	RU	ITMO University	itmo-008	008	2021-11-19
495	RU	IVA Cognitive	ivacognitive-001	001	2021-01-29
496	FR	Idemia	idemia-003	003	2018-10-19
497	FR	Idemia	idemia-004	004	2019-03-01
498	FR	Idemia	idemia-005	005	2019-10-11
499	FR	Idemia	idemia-006	006	2020-07-06
500	FR	Idemia	idemia-007	007	2020-12-04
501	FR	Idemia	idemia-008	008	2021-07-07
502	FR	Idemia	idemia-009	009	2022-07-27
503	FR	Idemia	idemia-010	010	2023-06-30
504	FR	Idemia	idemia-011	011	2024-08-06
505	FR	Idemia	morpho-000	000	2017-07-11
506	FR	Idemia	morpho-001	001	2017-07-10
507	FR	Idemia	morpho-002	002	2017-12-28
508	US	Imageware Systems	iws-000	000	2020-08-12
509	GB	Imperial College London	imperial-000	000	2019-03-01
510	GB	Imperial College London	imperial-001	001	2019-03-01
511	GB	Imperial College London	imperial-002	002	2019-08-28
512	US	Incode Technologies Inc	incode-000	000	2018-06-01
513	US	Incode Technologies Inc	incode-001	001	2018-06-13
514	US	Incode Technologies Inc	incode-002	002	2018-10-18
515	US	Incode Technologies Inc	incode-003	003	2019-03-01
516	US	Incode Technologies Inc	incode-004	004	2019-06-12
517	US	Incode Technologies Inc	incode-005	005	2019-10-17
518	US	Incode Technologies Inc	incode-006	006	2020-02-20
519	US	Incode Technologies Inc	incode-007	007	2020-08-25
520	US	Incode Technologies Inc	incode-008	008	2021-01-19
521	US	Incode Technologies Inc	incode-009	009	2021-06-22
522	US	Incode Technologies Inc	incode-010	010	2021-10-22
523	US	Incode Technologies Inc	incode-011	011	2022-08-10
524	US	Incode Technologies Inc	incode-012	012	2023-05-05
525	US	Incode Technologies Inc	incode-013	013	2023-12-08
526	US	Incode Technologies Inc	incode-014	014	2024-04-08
527	US	Incode Technologies Inc	incode-015	015	2025-06-12
528	IT	InfoCert	infocert-001	001	2022-09-08
529	IN	Innef Labs	innefulabs-000	000	2020-09-04
530	IN	Innominds Software SEZ India Pvt	innominds-001	001	2023-06-23
531	MY	Innov8tif Solutions	innov8tif-000	000	2024-12-10
532	GB	Innovative Technology	innovativetechnologyltd-001	001	2019-10-22
533	GB	Innovative Technology	innovativetechnologyltd-002	002	2020-02-26
534	SK	Innovatrics	innovatrics-000	000	2017-07-25
535	SK	Innovatrics	innovatrics-001	001	2017-07-25
536	SK	Innovatrics	innovatrics-002	002	2018-02-05
537	SK	Innovatrics	innovatrics-003	003	2018-06-14
538	SK	Innovatrics	innovatrics-004	004	2018-10-19
539	SK	Innovatrics	innovatrics-005	005	2019-03-01
540	SK	Innovatrics	innovatrics-006	006	2019-08-13
541	SK	Innovatrics	innovatrics-007	007	2020-08-19
542	SK	Innovatrics	innovatrics-008	008	2021-12-15
543	SK	Innovatrics	innovatrics-009	009	2022-01-19
544	SK	Innovatrics	innovatrics-010	010	2023-08-03
545	SK	Innovatrics	innovatrics-011	011	2024-03-08
546	SK	Innovatrics	innovatrics-012	012	2024-07-10
547	SK	Innovatrics	innovatrics-013	013	2024-11-13
548	SK	Innovatrics	innovatrics-014	014	2025-03-13
549	SK	Innovatrics	innovatrics-015	015	2025-07-24
550	SK	Innovatrics	innovatrics-016	016	2025-11-28
551	CN	InsightFace AI	insightface-000	000	2021-03-17
552	CN	InsightFace AI	insightface-001	001	2021-09-27
553	CN	InsightFace AI	insightface-002	002	2022-01-31
554	CN	InsightFace AI	insightface-003	003	2022-08-23
555	CN	InsightFace AI	insightface-004	004	2023-03-31
556	CN	Inspur (Beijing) Electronic Information Industry Co	inspur-000	000	2022-07-19
557	CN	Inspur (Beijing) Electronic Information Industry Co	inspur-001	001	2023-02-24
558	CN	Inspur (Beijing) Electronic Information Industry Co	inspur-002	002	2023-12-08
559	CN	Inspur (Beijing) Electronic Information Industry Co	inspur-003	003	2025-02-11
560	CN	Institute of Computing Technology	icthtc-000	000	2020-11-29

Table 8: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
561	RU	Institute of Information Technologies	iit-000	000	2019-03-01
562	RU	Institute of Information Technologies	iit-001	001	2019-07-05
563	RU	Institute of Information Technologies	iit-002	002	2019-12-04
564	RU	Institute of Information Technologies	iit-003	003	2020-12-01
565	IS	Intel Research Group	intelresearch-000	000	2019-07-08
566	IS	Intel Research Group	intelresearch-001	001	2020-01-14
567	IS	Intel Research Group	intelresearch-002	002	2020-07-24
568	IS	Intel Research Group	intelresearch-003	003	2021-01-18
569	IS	Intel Research Group	intelresearch-004	004	2021-08-24
570	IS	Intel Research Group	intelresearch-005	005	2022-02-13
571	IS	Intel Research Group	intelresearch-006	006	2022-12-19
572	IS	Intel Research Group	intelresearch-007	007	2023-05-30
573	IS	Intel Research Group	intelresearch-008	008	2023-10-03
574	IS	Intel Research Group	intelresearch-009	009	2024-03-26
575	IS	Intel Research Group	intelresearch-010	010	2024-08-20
576	IS	Intel Research Group	intelresearch-011	011	2024-12-24
577	IS	Intel Research Group	intelresearch-012	012	2025-07-03
578	KR	IntelliVIX	intellivix-001	001	2022-02-25
579	KR	IntelliVIX	intellivix-002	002	2022-07-14
580	KR	IntelliVIX	intellivix-003	003	2022-12-12
581	KR	IntelliVIX	intellivix-004	004	2023-06-21
582	KR	IntelliVIX	intellivix-005	005	2023-11-14
583	KR	IntelliVIX	intellivix-006	006	2025-07-31
584	AE	Intellibrain Technological Projects	g42-intellibrain-001	001	2022-07-27
585	AE	Intellibrain Technological Projects	g42-intellibrain-002	002	2023-05-10
586	CN	Intelligent Control Technology Co Ltd - IGearx	igearx-face-000	000	2023-03-28
587	US	Intellivision	intellivision-001	001	2017-10-10
588	US	Intellivision	intellivision-002	002	2019-08-23
589	US	Intellivision	intellivision-003	003	2022-03-07
590	US	Intellivision	intellivision-004	004	2022-07-28
591	US	Intellivision	intellivision-005	005	2023-02-06
592	US	Intellivision	intellivision-006	006	2023-07-14
593	US	Intellivision	intellivision-007	007	2023-12-19
594	LU	Intema-LGL Group	intema-000	000	2022-07-15
595	LU	Intema-LGL Group	intema-001	001	2023-01-11
596	US	InterLink labs	interlinklabs-001	001	2024-11-08
597	US	InterLink labs	interlinklabs-002	002	2025-04-21
598	US	InterLink labs	interlinklabs-003	003	2025-11-18
599	IN	Intozi Tech Pvt Ltd	intozi-001	001	2023-09-25
600	US	IrexAI	irex-000	000	2020-12-17
601	IL	Is It You	isityou-000	000	2017-06-26
602	MX	Jaak IT	jaakit-001	001	2022-05-20
603	MX	Jaak IT	jaakit-002	002	2025-09-11
604	GB	KYB-AI Ltd	kbyai-000	000	2024-11-29
605	KR	Kakao Bank	kakaobank-000	000	2023-02-27
606	KR	Kakao Bank	kakaobank-001	001	2023-10-10
607	KR	Kakao Bank	kakaobank-002	002	2024-04-01
608	KR	Kakao Bank	kakaobank-003	003	2024-09-30
609	KR	Kakao Brain	kakao-001	001	2019-03-01
610	KR	Kakao Brain	kakao-002	002	2019-06-19
611	KR	Kakao Brain	kakao-003	003	2020-02-26
612	KR	Kakao Brain	kakao-004	004	2020-10-28
613	KR	Kakao Brain	kakao-005	005	2021-03-09
614	KR	Kakao Brain	kakao-007	007	2022-01-12
615	KR	Kakao Brain	kakao-008	008	2022-05-12
616	KR	Kakao Brain	kakao-009	009	2023-11-07
617	KR	Kakao Pay Corp	kakaopay-001	001	2021-07-06
618	TH	Kasikorn Labs	kasikornlabs-000	000	2022-03-02
619	TH	Kasikorn Labs	kasikornlabs-001	001	2022-07-26
620	TH	Kasikorn Labs	kasikornlabs-002	002	2022-12-13
621	TH	Kasikorn Labs	kasikornlabs-003	003	2023-10-05
622	TH	Kasikorn Labs	kasikornlabs-004	004	2024-11-04
623	TH	Kasikorn Labs	kasikornlabs-005	005	2025-04-04
624	SG	Kedacom International Pte	kedacom-000	000	2019-06-03
625	GB	Keyless Technologies	keyless-000	000	2024-11-21
626	US	Kloudspot Inc	kloudspot-001	001	2024-09-03
627	US	Kloudspot Inc	kloudspot-002	002	2025-06-16
628	US	Kneron Inc	kneron-003	003	2019-07-01
629	US	Kneron Inc	kneron-005	005	2020-02-21
630	US	KnowUTech LLC	knowutech-000	000	2022-02-13

Table 9: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
631	US	Kogniza Technology	kogniza-001	001	2024-03-01
632	KR	Kookmin University	kookmin-001	001	2020-09-28
633	KR	Kookmin University	kookmin-002	002	2021-03-05
634	KR	Korea Identification Inc	koreaid-001	001	2022-12-12
635	TH	Krungthai	krungthai-002	002	2022-06-21
636	CN	KuKe3D Technology	kuke3d-001	001	2021-10-28
637	CN	KuKe3D Technology	kuke3d-002	002	2022-04-14
638	MX	Lebentech Biometrics	lebentech-000	000	2022-02-16
639	MX	Lebentech Biometrics	lebentech-001	001	2023-12-12
640	IN	Lema Labs	lemalabs-001	001	2021-04-13
641	KR	LightVision Inc	lightvision-000	000	2024-06-27
642	KR	LightVision Inc	lightvision-001	001	2025-02-18
643	JP	Line Corporation	lineclova-000	000	2021-03-31
644	JP	Line Corporation	lineclova-001	001	2021-09-26
645	JP	Line Corporation	lineclova-002	002	2022-05-18
646	JP	Line Corporation	lineclova-003	003	2022-11-28
647	RU	Lomonosov Moscow State University	intsysmsu-000	000	2019-06-18
648	RU	Lomonosov Moscow State University	intsysmsu-001	001	2019-10-22
649	RU	Lomonosov Moscow State University	intsysmsu-002	002	2020-03-12
650	IN	Lookman Electroplast Industries	lookman-002	002	2018-06-13
651	IN	Lookman Electroplast Industries	lookman-004	004	2019-06-03
652	US	Luxand Inc	luxand-000	000	2019-11-07
653	US	Luxand Inc	luxand-001	001	2023-10-17
654	US	Luxand Inc	luxand-003	003	2024-03-25
655	US	Luxand Inc	luxand-004	004	2024-08-01
656	VN	MB Bank	mbbankvn-000	000	2025-02-12
657	RU	MVision	mvision-001	001	2019-11-12
658	IN	Mantra Softech India	mantra-000	000	2021-10-28
659	ID	Matrix Comsec Pvt Ltd	matrixcomsec-000	000	2025-06-11
660	ID	Matrix Comsec Pvt Ltd	matrixcomsec-001	001	2025-11-26
661	AE	Maverick Research	maverickresearch-000	000	2024-12-26
662	CN	Maxvision Technology	maxvision-000	000	2021-10-27
663	CN	Maxvision Technology	maxvision-001	001	2022-03-03
664	CN	Maxvision Technology	maxvision-002	002	2022-07-12
665	CN	Maxvision Technology	maxvision-003	003	2022-11-14
666	CN	Maxvision Technology	maxvision-004	004	2023-05-08
667	CN	Maxvision Technology	maxvision-005	005	2023-09-21
668	CN	Maxvision Technology	maxvision-006	006	2024-01-19
669	CN	Megvii/Face++	megvii-000	000	2018-02-13
670	CN	Megvii/Face++	megvii-001	001	2018-06-15
671	CN	Megvii/Face++	megvii-002	002	2018-10-19
672	CN	Megvii/Face++	megvii-003	003	2021-03-08
673	CN	Megvii/Face++	megvii-004	004	2021-11-19
674	CN	Megvii/Face++	megvii-005	005	2022-03-28
675	CN	Megvii/Face++	megvii-006	006	2022-08-08
676	CN	Megvii/Face++	megvii-007	007	2023-05-17
677	CN	Megvii/Face++	megvii-008	008	2023-10-12
678	CN	Megvii/Face++	megvii-009	009	2024-02-12
679	KR	Metsakuur	metsakuurcompany-001	001	2022-05-12
680	KR	Metsakuur	metsakuurcompany-002	002	2022-09-14
681	KR	Metsakuur	metsakuurcompany-003	003	2023-04-04
682	KR	Metsakuur	metsakuurcompany-004	004	2024-10-24
683	KR	Metsakuur	metsakuurcompany-005	005	2025-07-31
684	CN	Miaxis Biometrics	miaxis-001	001	2022-11-15
685	CN	Miaxis Biometrics	miaxis-002	002	2023-03-22
686	CN	Miaxis Biometrics	miaxis-003	003	2023-09-19
687	CN	Miaxis Biometrics	miaxis-004	004	2025-12-09
688	GB	MicroFocus	microfocus-001	001	2018-06-13
689	GB	MicroFocus	microfocus-002	002	2018-10-17
690	GB	MicroFocus	microfocus-003	003	2023-02-23
691	GB	Microfocus	microfocus-000	000	2018-06-13
692	CN	Minivision	minivision-000	000	2020-10-28
693	UK	Mitek Systems	mitek-000	000	2023-01-27
694	UK	Mitek Systems	mitek-001	001	2024-07-02
695	UK	Mitek Systems	mitek-002	002	2024-11-19
696	NO	Mobai	mobai-000	000	2020-08-26
697	NO	Mobai	mobai-001	001	2021-02-17
698	NO	Mobai	mobai-002	002	2025-07-07
699	ES	Mobbeel Solutions	mobbl-000	000	2021-01-28
700	ES	Mobbeel Solutions	mobbl-001	001	2021-06-16

Table 10: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
701	ES	Mobbeel Solutions	mobbl-002	002	2021-12-16
702	ES	Mobbeel Solutions	mobbl-003	003	2022-04-19
703	ES	Mobbeel Solutions	mobbl-004	004	2024-05-20
704	ES	Mobbeel Solutions	mobbl-005	005	2024-10-15
705	KR	Mobipin Technology	mobipintech-000	000	2021-11-23
706	TH	Momentum Digital	sertis-000	000	2019-10-07
707	TH	Momentum Digital	sertis-001	001	2020-07-30
708	TH	Momentum Digital	sertis-002	002	2021-05-13
709	TH	Momentum Digital	sertis-003	003	2023-12-27
710	CN	MoreDian Technology	moredian-000	000	2021-02-24
711	US	Mukh Technologies	mukh-001	001	2022-03-22
712	US	Mukh Technologies	mukh-002	002	2022-11-01
713	US	Mukh Technologies	mukh-003	003	2023-03-15
714	US	Mukh Technologies	mukh-004	004	2023-09-13
715	US	Mukh Technologies	mukh-005	005	2024-12-05
716	CN	Multi-Modality Intelligence	multimodality-000	000	2021-10-19
717	CN	Multi-Modality Intelligence	multimodality-001	001	2022-05-16
718	RU	N-Tech Lab	ntechlab-000	000	2017-03-13
719	RU	N-Tech Lab	ntechlab-001	001	2017-05-10
720	RU	N-Tech Lab	ntechlab-002	002	2017-08-23
721	RU	N-Tech Lab	ntechlab-003	003	2017-12-29
722	RU	N-Tech Lab	ntechlab-004	004	2018-06-14
723	RU	N-Tech Lab	ntechlab-005	005	2018-10-19
724	RU	N-Tech Lab	ntechlab-006	006	2019-03-01
725	RU	N-Tech Lab	ntechlab-007	007	2019-06-25
726	RU	N-Tech Lab	ntechlab-008	008	2020-01-06
727	RU	N-Tech Lab	ntechlab-009	009	2020-12-30
728	RU	N-Tech Lab	ntechlab-010	010	2021-04-30
729	RU	N-Tech Lab	ntechlab-011	011	2021-09-13
730	RU	N-Tech Lab	ntechlab-012	012	2022-01-20
731	SG	NCS Pte Ltd	ncssg-001	001	2023-03-24
732	SG	NCS Pte Ltd	ncssg-002	002	2024-06-25
733	SG	NCS Pte Ltd	ncssg-003	003	2024-10-30
734	SG	NCS Pte Ltd	ncssg-004	004	2025-04-03
735	CA	NEO Systems	neosystems-001	001	2021-03-02
736	CA	NEO Systems	neosystems-002	002	2021-07-03
737	CA	NEO Systems	neosystems-003	003	2021-11-11
738	CA	NEO Systems	neosystems-004	004	2022-05-02
739	KR	NHN Corp	nhn-001	001	2021-03-15
740	KR	NHN Corp	nhn-002	002	2021-07-15
741	KR	NHN Corp	nhn-003	003	2022-02-22
742	KR	NHN Corp	nhn-004	004	2023-06-26
743	KR	NHN Corp	nhn-005	005	2023-12-06
744	KR	NSENSE Corp	nsensecorp-001	001	2020-10-20
745	KR	NSENSE Corp	nsensecorp-002	002	2021-05-06
746	KR	NSENSE Corp	nsensecorp-003	003	2021-10-29
747	KR	NSENSE Corp	nsensecorp-004	004	2022-09-08
748	KR	NSENSE Corp	nsensecorp-005	005	2023-02-08
749	CN	Nanjing Kiwi Network Technology	kiwitech-000	000	2021-03-19
750	KR	Naver Corp	clova-000	000	2020-10-21
751	KR	Neosecu Co	openface-001	001	2021-06-15
752	TW	Netbridge Technology Incoporation	netbridgetech-001	001	2020-01-08
753	TW	Netbridge Technology Incoporation	netbridgetech-002	002	2020-08-11
754	LT	Neurotechnology	neurotechnology-000	000	2017-03-22
755	LT	Neurotechnology	neurotechnology-001	001	2017-08-07
756	LT	Neurotechnology	neurotechnology-002	002	2017-11-02
757	LT	Neurotechnology	neurotechnology-003	003	2018-02-02
758	LT	Neurotechnology	neurotechnology-004	004	2018-10-19
759	LT	Neurotechnology	neurotechnology-005	005	2019-03-01
760	LT	Neurotechnology	neurotechnology-006	006	2019-06-26
761	LT	Neurotechnology	neurotechnology-008	008	2020-01-08
762	LT	Neurotechnology	neurotechnology-009	009	2020-07-07
763	LT	Neurotechnology	neurotechnology-010	010	2020-11-26
764	LT	Neurotechnology	neurotechnology-011	011	2021-03-26
765	LT	Neurotechnology	neurotechnology-012	012	2021-07-26
766	LT	Neurotechnology	neurotechnology-013	013	2022-01-07
767	LT	Neurotechnology	neurotechnology-015	015	2022-06-07
768	LT	Neurotechnology	neurotechnology-016	016	2023-02-01
769	LT	Neurotechnology	neurotechnology-017	017	2023-07-28
770	LT	Neurotechnology	neurotechnology-018	018	2024-02-09

Table 11: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
771	LT	Neurotechnology	neurotechnology-019	019	2024-07-31
772	LT	Neurotechnology	neurotechnology-020	020	2025-08-01
773	IN	NextMeta Labs	nextmetalabs-001	001	2024-07-02
774	IN	NextMeta Labs	nextmetalabs-002	002	2024-12-04
775	IN	NextMeta Labs	nextmetalabs-003	003	2025-07-08
776	US	Noblis	noblis-000	000	2017-07-05
777	ID	Nodeflux	nodeflux-000	000	2019-03-01
778	ID	Nodeflux	nodeflux-001	001	2019-03-01
779	ID	Nodeflux	nodeflux-002	002	2019-08-13
780	LT	Nominder	nominder-000	000	2023-02-06
781	LT	Nominder	nominder-001	001	2023-07-19
782	LT	Nominder	nominder-002	002	2023-11-04
783	LT	Nominder	nominder-003	003	2024-03-06
784	LT	Nominder	nominder-004	004	2024-07-11
785	LT	Nominder	nominder-005	005	2024-11-12
786	LT	Nominder	nominder-006	006	2025-04-07
787	IN	NotionTag Technologies Private Limited	notiontag-000	000	2019-06-12
788	IN	NotionTag Technologies Private Limited	notiontag-001	001	2021-03-04
789	IN	NotionTag Technologies Private Limited	notiontag-002	002	2021-09-17
790	US	OOTO AI	ooto-001	001	2025-09-11
791	US	Omnigarde Ltd	omnigarde-000	000	2021-04-05
792	US	Omnigarde Ltd	omnigarde-001	001	2021-08-23
793	US	Omnigarde Ltd	omnigarde-002	002	2022-01-19
794	US	Omnigarde Ltd	omnigarde-003	003	2023-05-10
795	US	Omnigarde Ltd	omnigarde-004	004	2024-06-24
796	US	Omnigarde Ltd	omnigarde-005	005	2025-06-02
797	KR	One More Security	omface-000	000	2021-12-15
798	KR	One More Security	omface-001	001	2022-10-21
799	UK	Onfido	onfido-000	000	2022-12-13
800	UK	Onfido	onfido-001	001	2025-07-17
801	UK	Onfido	onfido-002	002	2025-12-16
802	VN	Online Mobile Services JSC	momovn-001	001	2024-01-26
803	VN	Online Mobile Services JSC	momovn-002	002	2024-06-04
804	VN	Online Mobile Services JSC	momovn-003	003	2025-09-19
805	IN	Openedge Technologies Pvt	openedge-000	000	2024-01-29
806	AE	Ovision	ovisionllc-001	001	2024-04-03
807	AE	Ovision	ovisionllc-002	002	2024-08-05
808	RU	Oz Forensics LLC	oz-001	001	2020-07-29
809	RU	Oz Forensics LLC	oz-002	002	2021-01-18
810	RU	Oz Forensics LLC	oz-003	003	2021-08-09
811	RU	Oz Forensics LLC	oz-004	004	2021-12-13
812	TW	PAPAGO Inc	papago-001	001	2022-07-19
813	CZ	PAPIL11 S.R.O.	papil11-000	000	2024-01-04
814	CZ	PAPIL11 S.R.O.	papil11-001	001	2024-08-06
815	CZ	PAPIL11 S.R.O.	papil11-002	002	2025-01-02
816	CZ	PAPIL11 S.R.O.	papil11-003	003	2025-04-29
817	KR	PNPSecure	pnpsecure-000	000	2025-06-05
818	ID	PT Autentika Digital Indonesia	autentika-000	000	2022-12-05
819	ID	PT Autentika Digital Indonesia	autentika-001	001	2023-04-05
820	ID	PT Autentika Digital Indonesia	autentika-002	002	2023-11-21
821	ID	PT Autentika Digital Indonesia	autentika-003	003	2024-11-12
822	ID	PT Qlue Performa Indonesia	qluevision-001	001	2022-11-15
823	ID	PT Technology Biometric Indonesia	techbiometricid-001	001	2025-01-02
824	CH	PXL Vision AG	pxl-001	001	2020-06-30
825	TW	Palit Microsystems	palit-000	000	2022-05-16
826	TW	Palit Microsystems	palit-001	001	2022-09-26
827	SG	Panasonic R+D Center Singapore	psl-000	000	2018-06-18
828	SG	Panasonic R+D Center Singapore	psl-001	001	2018-10-12
829	SG	Panasonic R+D Center Singapore	psl-002	002	2019-02-28
830	SG	Panasonic R+D Center Singapore	psl-003	003	2019-10-01
831	SG	Panasonic R+D Center Singapore	psl-004	004	2020-03-03
832	SG	Panasonic R+D Center Singapore	psl-005	005	2020-07-06
833	SG	Panasonic R+D Center Singapore	psl-006	006	2020-11-13
834	SG	Panasonic R+D Center Singapore	psl-007	007	2021-03-19
835	SG	Panasonic R+D Center Singapore	psl-008	008	2021-07-21
836	SG	Panasonic R+D Center Singapore	psl-009	009	2021-12-08
837	SG	Panasonic R+D Center Singapore	psl-010	010	2022-04-19
838	SG	Panasonic R+D Center Singapore	psl-011	011	2022-10-06
839	SG	Panasonic R+D Center Singapore	psl-012	012	2023-10-13
840	SG	Panasonic R+D Center Singapore	psl-013	013	2024-04-18

Table 12: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
841	SG	Panasonic R+D Center Singapore	psl-014	014	2024-09-11
842	US	Pangiam	pangiam-000	000	2022-04-04
843	US	Pangiam	pangiam-001	001	2023-02-21
844	US	Pangiam	pangiam-002	002	2023-06-21
845	TR	Papilon Savunma	papsav1923-001	001	2021-03-10
846	TR	Papilon Savunma	papsav1923-002	002	2022-01-20
847	TR	Papilon Savunma	papsav1923-003	003	2022-11-25
848	US	Paravision	everai-000	000	2018-10-19
849	US	Paravision	everai-001	001	2018-10-19
850	US	Paravision	everai-002	002	2019-03-01
851	US	Paravision	paravision	003	2019-07-01
852	US	Paravision	paravision-004	004	2019-12-11
853	US	Paravision	paravision-006	006	2021-02-01
854	US	Paravision	paravision-008	008	2021-06-30
855	US	Paravision	paravision-010	010	2022-02-02
856	US	Paravision	paravision-011	011	2022-12-12
857	US	Paravision	paravision-013	013	2023-05-08
858	US	Paravision	paravision-015	015	2024-09-09
859	US	Paravision	paravision-017	017	2025-01-13
860	US	Paravision	paravision-018	018	2025-06-12
861	US	Paravision	paravision-020	020	2025-12-11
862	SG	Pensees Pte	pensees-001	001	2020-08-17
863	PL	Pentacomp Systemy Informatyczne	pentacomp-000	000	2024-09-26
864	CN	Ping An Technology	pa-002	002	2017-09-25
865	CN	Ping An Technology	pa-003	003	2017-05-25
866	US	Private Identity LLC	privid-001	001	2023-02-06
867	US	Private Identity LLC	privid-002	002	2023-10-03
868	US	Private Identity LLC	privid-003	003	2024-09-24
869	US	Private Identity LLC	privid-004	004	2025-03-05
870	IN	Pyramid Cyber Security + Forensic (P)	pyramid-000	000	2019-11-04
871	IN	Pyramid Cyber Security + Forensic (P)	pyramid-001	001	2024-11-26
872	KZ	Qaz Biometric Systems	qazbs-000	000	2022-06-22
873	KZ	QazSmartVision.AI	qazsmartvisionai-000	000	2024-01-11
874	KZ	QazSmartVision.AI	qazsmartvisionai-001	001	2024-05-21
875	KZ	QazSmartVision.AI	qazsmartvisionai-002	002	2024-09-25
876	KZ	QazSmartVision.AI	qazsmartvisionai-003	003	2025-01-30
877	KZ	QazSmartVision.AI	qazsmartvisionai-004	004	2025-07-18
878	TW	Qnap Security	qnap-000	000	2021-08-09
879	TW	Qnap Security	qnap-001	001	2021-12-09
880	TW	Qnap Security	qnap-002	002	2022-04-15
881	TW	Qnap Security	qnap-003	003	2022-12-09
882	TW	Qnap Security	qnap-004	004	2023-05-05
883	TW	Qnap Security	qnap-005	005	2023-11-16
884	TW	Qnap Security	qnap-006	006	2024-06-14
885	CZ	Quantasoft	quantasoft-003	003	2021-04-19
886	US	ROC	rankone-000	000	2017-03-21
887	US	ROC	rankone-001	001	2017-04-12
888	US	ROC	rankone-002	002	2017-08-18
889	US	ROC	rankone-003	003	2017-11-28
890	US	ROC	rankone-004	004	2018-06-12
891	US	ROC	rankone-005	005	2018-10-09
892	US	ROC	rankone-006	006	2019-02-27
893	US	ROC	rankone-007	007	2019-06-03
894	US	ROC	rankone-008	008	2019-11-12
895	US	ROC	rankone-009	009	2020-06-26
896	US	ROC	rankone-010	010	2020-11-05
897	US	ROC	rankone-011	011	2021-08-27
898	US	ROC	rankone-012	012	2021-12-27
899	US	ROC	rankone-013	013	2022-07-09
900	US	ROC	rankone-014	014	2022-12-21
901	US	ROC	rankone-015	015	2023-07-20
902	US	ROC	roc-016	016	2023-12-19
903	US	ROC	roc-017	017	2024-06-24
904	US	ROC	roc-018	018	2025-01-30
905	US	ROC	roc-019	019	2025-07-21
906	US	RealSense	realsense-001	001	2025-12-01
907	US	Realnetworks Inc	realnetworks-000	000	2018-05-30
908	US	Realnetworks Inc	realnetworks-001	001	2018-10-19
909	US	Realnetworks Inc	realnetworks-002	002	2019-02-28
910	US	Realnetworks Inc	realnetworks-003	003	2019-06-12

Table 13: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
911	US	Realnetworks Inc	realnetworks-004	004	2021-04-15
912	US	Realnetworks Inc	realnetworks-005	005	2021-09-27
913	US	Realnetworks Inc	realnetworks-006	006	2022-02-09
914	US	Realnetworks Inc	realnetworks-007	007	2022-06-14
915	US	Realnetworks Inc	realnetworks-008	008	2022-11-10
916	AE	Recognito	recognito-000	000	2023-05-24
917	AE	Recognito	recognito-001	001	2023-09-27
918	US	Regula Forensics	regula-000	000	2021-04-13
919	US	Regula Forensics	regula-001	001	2021-12-14
920	US	Regula Forensics	regula-002	002	2025-09-15
921	AM	Regular Biometrics Solutions	rebs-000	000	2023-08-22
922	AM	Regular Biometrics Solutions	rebs-001	001	2023-12-22
923	CN	Remark Holdings	remarkai-000	000	2019-03-01
924	CN	Remark Holdings	remarkai-001	001	2019-03-01
925	CN	Remark Holdings	remarkai-002	002	2019-11-21
926	CN	Remark Holdings	remarkai-003	003	2021-06-22
927	SG	Rendip	rendip-000	000	2021-04-19
928	UK	Reveal Media Ltd	revealmedia-005	005	2021-09-24
929	UK	Reveal Media Ltd	revealmedia-006	006	2022-01-26
930	CN	Rokid Corporation	rokid-000	000	2019-08-01
931	CN	Rokid Corporation	rokid-001	001	2019-12-13
932	KR	SK Telecom	sktelecom-000	000	2021-07-09
933	KR	SQIsoft	sqisoft-001	001	2021-07-27
934	KR	SQIsoft	sqisoft-002	002	2021-11-03
935	KR	SQIsoft	sqisoft-003	003	2022-10-26
936	SG	ST Engineering	stengg-000	000	2023-06-06
937	SA	STCON LLC	stcon-000	000	2022-11-02
938	SA	STCON LLC	stcon-001	001	2023-03-03
939	SA	STCON LLC	stcon-002	002	2023-07-05
940	SA	STCON LLC	stcon-003	003	2023-11-07
941	SA	STCON LLC	stcon-004	004	2024-06-18
942	SA	STCON LLC	stcon-005	005	2024-11-13
943	SA	STCON LLC	stcon-006	006	2025-03-17
944	SA	STCON LLC	stcon-007	007	2025-07-18
945	SA	STCON LLC	stcon-008	008	2025-12-30
946	DE	Saffe	saffe-001	001	2018-10-19
947	DE	Saffe	saffe-002	002	2019-03-01
948	JP	Saga Densan Center Co Ltd	sdc-000	000	2022-10-18
949	KR	Samsung S1 Corp	s1-001	001	2019-12-06
950	KR	Samsung S1 Corp	s1-002	002	2021-03-24
951	KR	Samsung S1 Corp	s1-003	003	2021-08-24
952	KR	Samsung S1 Corp	s1-004	004	2022-01-04
953	KR	Samsung S1 Corp	s1-005	005	2022-06-17
954	KR	Samsung S1 Corp	s1-006	006	2022-10-17
955	KR	Samsung S1 Corp	s1-007	007	2023-03-20
956	KR	Samsung S1 Corp	s1-008	008	2024-10-16
957	KR	Samsung S1 Corp	s1-009	009	2025-02-25
958	KR	Samsung-SDS	samsungsds-000	000	2021-10-28
959	KR	Samsung-SDS	samsungsds-001	001	2022-04-18
960	KR	Samsung-SDS	samsungsds-002	002	2022-09-16
961	IN	Samtech InfoNet Limited	samtech-000	000	2017-05-02
962	IN	Samtech InfoNet Limited	samtech-001	001	2019-10-15
963	IN	Samtech InfoNet Limited	samtech-002	002	2023-07-06
964	RU	Satellite Innovation/Eocortex	eocortex-000	000	2020-08-26
965	IL	Scanovate	scanovate-001	001	2019-11-12
966	IL	Scanovate	scanovate-002	002	2020-06-26
967	IL	Scanovate	scanovate-003	003	2021-11-15
968	NG	Seamfix	seamfix-001	001	2024-03-08
969	RO	Securif AI	securifai-001	001	2020-10-06
970	RO	Securif AI	securifai-002	002	2021-03-19
971	RO	Securif AI	securifai-003	003	2021-08-03
972	RO	Securif AI	securifai-004	004	2021-12-21
973	RO	Securif AI	securifai-005	005	2022-05-16
974	RO	Securif AI	securifai-006	006	2022-11-14
975	RO	Securif AI	securifai-007	007	2023-08-17
976	RO	Securif AI	securifai-008	008	2024-02-26
977	CN	Sensetime Group	sensetime-001	001	2018-10-19
978	CN	Sensetime Group	sensetime-002	002	2018-10-19
979	CN	Sensetime Group	sensetime-003	003	2019-06-04
980	CN	Sensetime Group	sensetime-004	004	2020-11-20

Table 14: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
981	CN	Sensetime Group	sensetime-005	005	2021-05-24
982	CN	Sensetime Group	sensetime-006	006	2021-12-28
983	CN	Sensetime Group	sensetime-007	007	2022-06-17
984	CN	Sensetime Group	sensetime-008	008	2023-01-04
985	CN	Sensetime Group	sensetime-010	010	2024-12-03
986	UZ	Serendipity Ltd	serendipity-000	000	2023-05-31
987	SG	Seventh Sense Artificial Intelligence	seventhsense-000	000	2021-06-29
988	SG	Seventh Sense Artificial Intelligence	seventhsense-001	001	2022-03-04
989	SG	Seventh Sense Artificial Intelligence	seventhsense-002	002	2022-10-17
990	SG	Seventh Sense Artificial Intelligence	seventhsense-003	003	2023-05-31
991	SG	Seventh Sense Artificial Intelligence	seventhsense-005	005	2023-10-05
992	SG	Seventh Sense Artificial Intelligence	seventhsense-006	006	2024-07-09
993	US	Shaman Software	shaman-000	000	2017-12-05
994	US	Shaman Software	shaman-001	001	2018-01-13
995	CN	Shanghai Jiao Tong University	sjtu-001	001	2019-09-27
996	CN	Shanghai Jiao Tong University	sjtu-002	002	2020-02-12
997	CN	Shanghai Jiao Tong University	sjtu-003	003	2020-11-02
998	CN	Shanghai Jiao Tong University	sjtu-004	004	2021-05-13
999	CN	Shanghai Jiao Tong University	sjtu-005	005	2023-05-05
1000	CN	Shanghai Jiao Tong University	sjtu-006	006	2024-12-06
1001	CN	Shanghai Jiao Tong University	sjtu-007	007	2025-04-16
1002	CN	Shanghai Jiao Tong University	sjtu-008	008	2025-12-11
1003	CN	Shanghai Ulucu Electronics Technology	uluface-002	002	2019-07-10
1004	CN	Shanghai Ulucu Electronics Technology	uluface-003	003	2019-11-12
1005	CN	Shanghai University - Shanghai Film Academy	shu-001	001	2019-06-17
1006	CN	Shanghai University - Shanghai Film Academy	shu-002	002	2019-12-10
1007	CN	Shanghai University - Shanghai Film Academy	shu-003	003	2020-06-24
1008	CN	Shanghai Yitu Technology	yitu-000	000	2017-05-23
1009	CN	Shanghai Yitu Technology	yitu-001	001	2018-06-12
1010	CN	Shanghai Yitu Technology	yitu-002	002	2018-10-19
1011	CN	Shanghai Yitu Technology	yitu-003	003	2019-03-01
1012	CN	Shenzhen AiMall Tech	aimall-001	001	2019-11-12
1013	CN	Shenzhen AiMall Tech	aimall-002	002	2020-03-12
1014	CN	Shenzhen AiMall Tech	aimall-003	003	2020-08-12
1015	CN	Shenzhen EI Networks	einetworks-000	000	2019-08-13
1016	CN	Shenzhen Inst Adv Integrated Tech CAS	siat-002	002	2018-06-13
1017	CN	Shenzhen Inst Adv Integrated Tech CAS	siat-004	004	2019-03-01
1018	CN	Shenzhen Inst Adv Integrated Tech CAS	siat-005	005	2022-02-08
1019	CN	Shenzhen Intellifusion Technologies	intellifusion-001	001	2019-08-22
1020	CN	Shenzhen Intellifusion Technologies	intellifusion-002	002	2020-03-18
1021	CN	Shenzhen Polytechnic University	szpu-000	000	2025-03-28
1022	CN	Shenzhen University-Macau University of Science and Technology	sztu-000	000	2020-12-17
1023	CN	Shenzhen University-Macau University of Science and Technology	sztu-001	001	2021-07-13
1024	QA	Sightropic	sightropic-000	000	2025-03-26
1025	QA	Sightropic	sightropic-001	001	2025-11-25
1026	RU	Smart Engines	smartengines-000	000	2021-08-25
1027	RU	Smart Engines	smartengines-001	001	2022-05-31
1028	ES	Smartbiometrik	smartbiometrik-001	001	2022-05-16
1029	TR	Smarvist Teknoloji	smartvist-000	000	2022-05-10
1030	TR	Smarvist Teknoloji	smartvist-001	001	2023-11-02
1031	DE	Smilart	smilart-001	001	2018-02-06
1032	DE	Smilart	smilart-002	002	2018-02-06
1033	DE	Smilart	smilart-003	003	2019-03-01
1034	TR	Sodec App Inc	sodec-000	000	2021-06-02
1035	CN	Sparktek International Pte Ltd	sparktek-000	000	2025-11-24
1036	IN	Sparsh CCTV	sparsh-001	001	2024-01-02
1037	IN	Staqu Technologies	staqu-000	000	2020-07-15
1038	CN	Star Hybrid Limited	starhybrid-001	001	2019-06-19
1039	CN	Su Zhou NaZhiTianDi intelligent technology	nazhiai-000	000	2020-06-25
1040	IN	Sukshi Technology Innovation	sukshi-000	000	2022-02-13
1041	GB	Sum and Substance Ltd	sumsub-000	000	2025-12-15
1042	KR	Suprema AI Inc	suprema-000	000	2021-03-31
1043	KR	Suprema AI Inc	suprema-001	001	2021-09-23
1044	KR	Suprema AI Inc	suprema-002	002	2022-02-11
1045	KR	Suprema AI Inc	suprema-003	003	2022-07-20
1046	KR	Suprema AI Inc	suprema-004	004	2023-01-09
1047	KR	Suprema AI Inc	suprema-005	005	2023-10-25
1048	KR	Suprema ID Inc	supremaid-001	001	2021-05-04
1049	KR	Suprema ID Inc	supremaid-002	002	2022-06-24
1050	UK	Swsam Solutions	swsam-001	001	2023-03-13

Table 15: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
1051	RU	Synesis	synesis-000	000	2018-02-09
1052	RU	Synesis	synesis-001	001	2018-05-31
1053	RU	Synesis	synesis-003	003	2018-10-19
1054	RU	Synesis	synesis-004	004	2019-03-01
1055	RU	Synesis	synesis-005	005	2019-06-06
1056	RU	Synesis	synesis-006	006	2019-10-10
1057	RU	Synesis	synesis-007	007	2020-06-24
1058	TW	Synology Inc	synology-000	000	2019-10-23
1059	TW	Synology Inc	synology-001	001	2020-02-26
1060	TW	Synology Inc	synology-002	002	2020-08-20
1061	IT	Syscake S.r.l.	syscake-000	000	2024-11-26
1062	BR	T4iSB	t4isb-000	000	2022-01-28
1063	SA	TAHAKOM	tahakom-001	001	2024-10-17
1064	MY	TNG Digital Sdn Bhd	tngd-001	001	2025-03-17
1065	VN	TNI Tech Co	tnitech-000	000	2024-02-05
1066	VN	TTI Group	ttigroup-000	000	2024-12-16
1067	CN	TUPU Technology	tuputech-000	000	2019-10-11
1068	TW	Taiwan AI Labs	ailabs-001	001	2019-12-18
1069	TW	Taiwan Computer Vision	tcv-001	001	2024-05-30
1070	TW	Taiwan Mobile	taiwanmobile-001	001	2024-08-06
1071	TW	Taiwan Mobile	taiwanmobile-002	002	2024-12-11
1072	TW	Taiwan-Certificate Authority Incorporation	twface-000	000	2021-05-14
1073	TW	Taiwan-Certificate Authority Incorporation	twface-001	001	2021-09-14
1074	CH	Tech5 SA	tech5-000	000	2018-10-09
1075	CH	Tech5 SA	tech5-001	001	2018-10-19
1076	CH	Tech5 SA	tech5-002	002	2019-03-01
1077	CH	Tech5 SA	tech5-003	003	2019-08-19
1078	CH	Tech5 SA	tech5-004	004	2020-03-09
1079	CH	Tech5 SA	tech5-005	005	2020-07-24
1080	CH	Tech5 SA	tech5-007	007	2022-12-30
1081	CH	Tech5 SA	tech5-008	008	2023-08-11
1082	CH	Tech5 SA	tech5-009	009	2025-04-17
1083	VN	Techainer	techainer-001	001	2023-11-30
1084	VN	Techainer	techainer-002	002	2025-02-14
1085	TR	Techsign	techsign-000	000	2021-08-25
1086	TR	Techsign	techsign-001	001	2022-07-01
1087	TW	Telexper International	telexper-000	000	2024-06-21
1088	CN	Tencent Deepsea Lab	deepsea-001	001	2019-06-03
1089	RU	Tevian	tevian-000	000	2017-12-10
1090	RU	Tevian	tevian-001	001	2018-01-19
1091	RU	Tevian	tevian-002	002	2018-06-14
1092	RU	Tevian	tevian-003	003	2018-10-19
1093	RU	Tevian	tevian-004	004	2019-03-01
1094	RU	Tevian	tevian-005	005	2019-09-21
1095	RU	Tevian	tevian-006	006	2020-09-11
1096	RU	Tevian	tevian-007	007	2021-08-06
1097	RU	Tevian	tevian-008	008	2021-12-06
1098	US	TigerIT Bangladesh Ltd	tiger-001	001	2018-01-23
1099	US	TigerIT Bangladesh Ltd	tiger-002	002	2018-06-13
1100	US	TigerIT Bangladesh Ltd	tiger-003	003	2018-10-16
1101	US	TigerIT Bangladesh Ltd	tiger-004	004	2020-12-01
1102	US	TigerIT Bangladesh Ltd	tiger-005	005	2021-07-29
1103	US	TigerIT Bangladesh Ltd	tiger-006	006	2021-12-13
1104	US	TigerIT Bangladesh Ltd	tiger-007	007	2025-03-05
1105	RU	Tinkoff Bank	tinkoff-001	001	2021-05-13
1106	CN	TongYi Transportation Technology	tongyi-004	004	2018-10-19
1107	CN	TongYi Transportation Technology	tongyi-005	005	2019-06-12
1108	CN	TongYi Transportation Technology	tongyitrans-001	001	2017-04-01
1109	CN	TongYi Transportation Technology	tongyitrans-002	002	2017-07-15
1110	CN	TongYi Transportation Technology	tongyitrans-003	003	2018-05-15
1111	TW	Toppan ID Gate	toppanidgate-000	000	2021-09-28
1112	JP	Toshiba	toshiba-000	000	2018-01-11
1113	JP	Toshiba	toshiba-001	001	2018-01-11
1114	JP	Toshiba	toshiba-002	002	2018-10-19
1115	JP	Toshiba	toshiba-003	003	2019-03-01
1116	JP	Toshiba	toshiba-004	004	2021-09-27
1117	JP	Toshiba	toshiba-005	005	2022-02-09
1118	JP	Toshiba	toshiba-006	006	2022-06-29
1119	JP	Toshiba	toshiba-007	007	2023-09-13
1120	JP	Toshiba	toshiba-008	008	2024-02-01

Table 16: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
1121	JP	Toshiba	toshiba-009	009	2024-09-16
1122	JP	Toshiba	toshiba-010	010	2025-02-03
1123	JP	Toshiba	toshiba-011	011	2025-07-08
1124	JP	Toshiba	toshiba-012	012	2026-01-09
1125	KR	Toss	toss-000	000	2025-09-22
1126	ES	Touchless ID	touchlessid-000	000	2022-05-02
1127	ES	Touchless ID	touchlessid-001	001	2022-09-21
1128	ES	Touchless ID	touchlessid-002	002	2023-01-23
1129	ES	Touchless ID	touchlessid-003	003	2023-07-12
1130	ES	Touchless ID	touchlessid-004	004	2024-12-27
1131	Il	Transmit Security Ltd	transmitsecurity-001	001	2025-12-04
1132	JP	Tripleize	aize-001	001	2021-04-23
1133	JP	Tripleize	aize-002	002	2021-10-08
1134	JP	Tripleize	aize-003	003	2023-08-10
1135	VN	TrueID-VNG	trueidvng-001	001	2023-01-05
1136	US	Trueface.ai	trueface-000	000	2019-10-08
1137	US	Trueface.ai	trueface-001	001	2020-07-20
1138	US	Trueface.ai	trueface-002	002	2021-03-29
1139	US	Trueface.ai	trueface-003	003	2021-09-30
1140	UK	Trust Stamp	truststamp-001	001	2023-07-14
1141	UK	Trust Stamp	truststamp-002	002	2025-05-23
1142	UK	Trust Stamp	truststamp-003	003	2025-11-19
1143	CN	TuringTech.vip	turingtechvip-001	001	2022-02-03
1144	CN	TuringTech.vip	turingtechvip-002	002	2022-07-27
1145	TR	Turkcell Technology	turkcell-000	000	2022-10-11
1146	TR	Turkcell Technology	turkcell-001	001	2023-03-15
1147	TR	Turkcell Technology	turkcell-002	002	2024-03-18
1148	CN	ULSee Inc	ulsee-001	001	2019-07-31
1149	UN	UNICC-Solution Architecture Section	unicc-001	001	2023-02-17
1150	UN	UNICC-Solution Architecture Section	unicc-002	002	2023-06-07
1151	UN	UNICC-Solution Architecture Section	unicc-003	003	2023-10-16
1152	UN	UNICC-Solution Architecture Section	unicc-004	004	2024-09-23
1153	TW	UXLabs	uxlabs-001	001	2022-09-19
1154	TW	UXLabs	uxlabs-003	003	2023-07-28
1155	UZ	UZINFOCOM	uzinfocom-000	000	2025-07-28
1156	HU	Ultinous	ultinous-000	000	2017-12-18
1157	HU	Ultinous	ultinous-001	001	2018-02-02
1158	FR	Unissey	unissey-001	001	2021-11-29
1159	FR	Unissey	unissey-002	002	2022-04-29
1160	FR	Unissey	unissey-003	003	2022-12-19
1161	FR	Unissey	unissey-004	004	2023-07-19
1162	FR	Unissey	unissey-005	005	2024-08-06
1163	FR	Unissey	unissey-006	006	2025-09-11
1164	PT	Universidade de Coimbra	visteam-000	000	2020-01-14
1165	PT	Universidade de Coimbra	visteam-001	001	2021-03-16
1166	PT	Universidade de Coimbra	visteam-002	002	2021-08-20
1167	PT	Universidade de Coimbra	visteam-003	003	2022-01-31
1168	PT	Universidade de Coimbra	visteam-004	004	2022-08-01
1169	PT	Universidade de Coimbra	visteam-005	005	2023-01-04
1170	PT	Universidade de Coimbra	visteam-006	006	2023-05-25
1171	PT	Universidade de Coimbra	visteam-007	007	2023-10-18
1172	PT	Universidade de Coimbra	visteam-008	008	2024-02-06
1173	PT	Universidade de Coimbra	visteam-009	009	2024-07-26
1174	PT	Universidade de Coimbra	visteam-010	010	2025-05-28
1175	UK	University of Surrey-CVSSP	surrey-cvssp-000	000	2022-03-25
1176	UK	University of Surrey-CVSSP	surrey-cvssp-001	001	2022-09-22
1177	UK	University of Surrey-CVSSP	surrey-cvssp-002	002	2023-02-16
1178	UK	University of Surrey-CVSSP	surrey-cvssp-003	003	2023-09-13
1179	UK	University of Surrey-CVSSP	surrey-cvssp-004	004	2024-07-11
1180	US	VCognition	vcog-002	002	2017-06-12
1181	VN	VNIS Joint Stock	vnis-000	000	2024-01-08
1182	US	Vaidio	vaidio-001	001	2025-12-10
1183	US	Vcortex Labs	vcortex-001	001	2023-06-14
1184	ES	Veridas Digital Authentication Solutions S.L.	veridas-001	001	2019-03-01
1185	ES	Veridas Digital Authentication Solutions S.L.	veridas-002	002	2019-03-01
1186	ES	Veridas Digital Authentication Solutions S.L.	veridas-003	003	2019-11-27
1187	ES	Veridas Digital Authentication Solutions S.L.	veridas-004	004	2020-07-21
1188	ES	Veridas Digital Authentication Solutions S.L.	veridas-005	005	2020-12-15
1189	ES	Veridas Digital Authentication Solutions S.L.	veridas-006	006	2021-04-15
1190	ES	Veridas Digital Authentication Solutions S.L.	veridas-007	007	2021-09-02

Table 17: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
1191	ES	Veridas Digital Authentication Solutions S.L.	veridas-008	008	2022-10-17
1192	ES	Veridas Digital Authentication Solutions S.L.	veridas-009	009	2023-05-08
1193	ES	Veridas Digital Authentication Solutions S.L.	veridas-010	010	2025-03-18
1194	UK	Veridium	veridium-000	000	2022-03-28
1195	UK	Veridium	veridium-001	001	2022-11-03
1196	UK	Veridium	veridium-002	002	2023-06-30
1197	UK	Veridium	veridium-003	003	2024-02-21
1198	KZ	Verigram	verigram-000	000	2021-09-06
1199	KZ	Verigram	verigram-001	001	2022-03-09
1200	KZ	Verigram	verigram-002	002	2023-04-03
1201	KZ	Verigram	verigram-003	003	2023-08-09
1202	ID	Verihubs	verihubs-inteligensia-000	000	2021-07-27
1203	ID	Verihubs	verihubs-inteligensia-001	001	2022-06-16
1204	ID	Verihubs	verihubs-inteligensia-002	002	2023-06-07
1205	ID	Verijelas	verijelas-000	000	2022-08-01
1206	TW	Via Technologies Inc	via-000	000	2019-07-08
1207	TW	Via Technologies Inc	via-001	001	2020-01-08
1208	TW	Via Technologies Inc	via-004	004	2023-02-23
1209	TW	Via Technologies Inc	via-005	005	2023-12-26
1210	TW	Via Technologies Inc	via-006	006	2025-02-24
1211	AE	Viante.AI	viante-000	000	2023-06-09
1212	AE	Viante.AI	viante-001	001	2024-12-30
1213	AE	Viante.AI	viante-002	002	2025-06-17
1214	DE	Videmo Intelligente Videoanalyse	videmo-000	000	2019-12-19
1215	DE	Videmo Intelligente Videoanalyse	videmo-001	001	2021-12-22
1216	DE	Videmo Intelligente Videoanalyse	videmo-002	002	2022-08-31
1217	DE	Videmo Intelligente Videoanalyse	videmo-003	003	2024-06-18
1218	IN	Videonetics Technology Pvt	videonetics-001	001	2019-06-19
1219	IN	Videonetics Technology Pvt	videonetics-002	002	2019-11-21
1220	VN	Vietnam National Cyber Security Technology Corporation	ncsgroup-000	000	2024-03-18
1221	VN	Vietnam Payment Solution	vnpay-000	000	2023-12-05
1222	VN	Vietnam Payment Solution	vnpay-001	001	2024-10-15
1223	VN	Vietnam Posts and Telecommunications Group	vnpt-001	001	2021-01-08
1224	VN	Vietnam Posts and Telecommunications Group	vnpt-002	002	2021-06-08
1225	VN	Vietnam Posts and Telecommunications Group	vnpt-003	003	2021-12-01
1226	VN	Vietnam Posts and Telecommunications Group	vnpt-004	004	2022-04-15
1227	VN	Vietnam Posts and Telecommunications Group	vnpt-005	005	2022-08-24
1228	VN	Vietnam Posts and Telecommunications Group	vnpt-006	006	2023-08-18
1229	VN	Vietnam Posts and Telecommunications Group	vnpt-007	007	2024-04-29
1230	VN	Vietnam Posts and Telecommunications Group	vnpt-008	008	2024-09-20
1231	VN	Vietnam Posts and Telecommunications Group	vnpt-009	009	2025-06-04
1232	VN	Viettel Artificial Intelligence and Data Services Center	viettelai-004	004	2025-11-26
1233	VN	Viettel Cyberspace Center	vtcc-000	000	2023-06-26
1234	VN	Viettel Cyberspace Center	vtcc-001	001	2023-11-20
1235	VN	Viettel Cyberspace Center	vtcc-002	002	2024-07-17
1236	VN	Viettel Cyberspace Center	vtcc-003	003	2025-02-27
1237	VN	Viettel Group	vts-000	000	2020-11-04
1238	VN	Viettel Group	vts-001	001	2022-04-20
1239	VN	Viettel Group	vts-002	002	2024-06-04
1240	VN	Viettel High Technology	viettelhightech-000	000	2021-08-04
1241	VN	Viettel High Technology	viettelhightech-001	001	2025-03-18
1242	VN	Viettel High Technology	viettelhightech-002	002	2025-10-15
1243	US	Vigilant Solutions	vigilantsolutions-000	000	2017-03-30
1244	US	Vigilant Solutions	vigilantsolutions-001	001	2017-06-13
1245	US	Vigilant Solutions	vigilantsolutions-002	002	2017-09-28
1246	US	Vigilant Solutions	vigilantsolutions-003	003	2018-01-23
1247	US	Vigilant Solutions	vigilantsolutions-004	004	2018-06-14
1248	US	Vigilant Solutions	vigilantsolutions-005	005	2018-10-11
1249	US	Vigilant Solutions	vigilantsolutions-006	006	2019-03-01
1250	US	Vigilant Solutions	vigilantsolutions-007	007	2019-06-27
1251	US	Vigilant Solutions	vigilantsolutions-008	008	2020-08-03
1252	US	Vigilant Solutions	vigilantsolutions-009	009	2020-12-07
1253	US	Vigilant Solutions	vigilantsolutions-010	010	2021-04-07
1254	US	Vigilant Solutions	vigilantsolutions-011	011	2021-08-07
1255	VN	VinAI Research VietNam	vinai-000	000	2020-09-24
1256	VN	VinBigData	vinbigdata-001	001	2022-01-06
1257	VN	VinBigData	vinbigdata-002	002	2022-06-07
1258	VN	VinBigData	vinbigdata-003	003	2023-06-23
1259	VN	VinBigData	vinbigdata-004	004	2024-05-08
1260	VN	VinBigData	vinbigdata-005	005	2024-10-16

Table 18: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
1261	VN	VinBigData	vinbigdata-006	006	2025-02-19
1262	VN	VinBigData	vinbigdata-007	007	2025-07-24
1263	SE	Visage Technologies	visage-000	000	2020-12-09
1264	BR	Visica AI Solutions	visica-001	001	2025-02-14
1265	BR	Visica AI Solutions	visica-002	002	2025-07-15
1266	FI	Visidon	vd-000	000	2018-06-13
1267	FI	Visidon	vd-001	001	2019-02-26
1268	FI	Visidon	vd-002	002	2021-04-12
1269	FI	Visidon	vd-003	003	2021-10-12
1270	CN	Vision Intelligence Center of Meituan	meituan-000	000	2021-05-14
1271	CN	Vision Intelligence Center of Meituan	meituan-001	001	2022-03-25
1272	CN	Vision Intelligence Center of Meituan	meituan-002	002	2022-09-14
1273	CN	Vision Intelligence Center of Meituan	meituan-003	003	2023-03-06
1274	CN	Vision Intelligence Center of Meituan	meituan-004	004	2023-08-16
1275	PT	Vision-Box	visionbox-000	000	2019-02-26
1276	PT	Vision-Box	visionbox-001	001	2019-03-01
1277	PT	Vision-Box	visionbox-002	002	2021-04-29
1278	PT	Vision-Box	visionbox-003	003	2023-02-01
1279	PT	Vision-Box	visionbox-004	004	2023-06-30
1280	PT	Vision-Box	visionbox-005	005	2024-07-29
1281	PT	Vision-Box	visionbox-006	006	2025-07-29
1282	RU	VisionLabs	visionlabs-001	001	2017-06-12
1283	RU	VisionLabs	visionlabs-002	002	2017-09-08
1284	RU	VisionLabs	visionlabs-003	003	2018-02-02
1285	RU	VisionLabs	visionlabs-004	004	2018-06-15
1286	RU	VisionLabs	visionlabs-005	005	2018-10-19
1287	RU	VisionLabs	visionlabs-006	006	2019-03-01
1288	RU	VisionLabs	visionlabs-007	007	2019-06-12
1289	RU	VisionLabs	visionlabs-008	008	2020-01-06
1290	RU	VisionLabs	visionlabs-009	009	2020-07-27
1291	RU	VisionLabs	visionlabs-010	010	2021-01-25
1292	RU	VisionLabs	visionlabs-011	011	2021-10-13
1293	TW	Vivotek	vivotek-001	001	2024-04-03
1294	TW	Vivotek	vivotek-002	002	2024-08-15
1295	AU	Vixvizon	vixvizion-000	000	2019-06-19
1296	AU	Vixvizon	vixvizion-001	001	2019-10-22
1297	AU	Vixvizon	vixvizion-002	002	2020-12-31
1298	AU	Vixvizon	vixvizion-003	003	2021-05-18
1299	AU	Vixvizon	vixvizion-004	004	2021-09-20
1300	AU	Vixvizon	vixvizion-005	005	2022-03-03
1301	AU	Vixvizon	vixvizion-006	006	2022-08-11
1302	AU	Vixvizon	vixvizion-007	007	2023-01-17
1303	US	Vocalize	vocalize-001	001	2024-03-27
1304	RU	Vocord	vocord-001	001	2017-04-21
1305	RU	Vocord	vocord-002	002	2017-06-07
1306	RU	Vocord	vocord-003	003	2018-01-23
1307	RU	Vocord	vocord-004	004	2018-06-15
1308	RU	Vocord	vocord-005	005	2018-10-19
1309	RU	Vocord	vocord-006	006	2019-03-01
1310	RU	Vocord	vocord-007	007	2019-06-06
1311	RU	Vocord	vocord-008	008	2020-01-31
1312	RU	Vocord	vocord-009	009	2020-12-28
1313	RU	Vocord	vocord-010	010	2021-12-20
1314	BR	Vsoft	vsoft-001	001	2025-08-01
1315	BR	Vsoft	vsoft-002	002	2025-11-28
1316	US	Wicket	wicket-000	000	2022-02-14
1317	CN	Winsense	winsense-000	000	2019-06-17
1318	CN	Winsense	winsense-001	001	2019-10-16
1319	CN	Winsense	winsense-002	002	2020-11-20
1320	MY	Wise AI SDN BHD	wiseai-001	001	2022-10-25
1321	CN	Wuhan Tianyu Information Industry	wuhantianyu-001	001	2021-08-05
1322	CN	X-Laboratory	x-laboratory-000	000	2019-09-03
1323	CN	X-Laboratory	x-laboratory-001	001	2020-01-21
1324	CN	Xforward AI Technology	xforwardai-000	000	2020-02-06
1325	CN	Xforward AI Technology	xforwardai-001	001	2020-09-25
1326	CN	Xforward AI Technology	xforwardai-002	002	2021-02-10
1327	CN	Xiamen Meiya Pico Information	meiya-001	001	2019-03-01
1328	CN	Xiamen University	xm-000	000	2020-10-19
1329	PT	YooniK	yoonik-000	000	2020-06-24
1330	PT	YooniK	yoonik-001	001	2020-10-26

Table 19: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Location	Developer Name	Short Name	Seq. Num.	Validation Date
1331	PT	YooniK	yoonik-002	002	2021-09-06
1332	PT	YooniK	yoonik-003	003	2022-01-06
1333	PT	YooniK	yoonik-004	004	2023-02-10
1334	UK	Yoti	yoti-001	001	2024-02-13
1335	UK	Yoti	yoti-002	002	2024-07-03
1336	TW	Yuan High-Tech Development	yuan-000	000	2020-06-30
1337	TW	Yuan High-Tech Development	yuan-001	001	2021-01-08
1338	TW	Yuan High-Tech Development	yuan-002	002	2021-05-17
1339	TW	Yuan High-Tech Development	yuan-003	003	2021-09-17
1340	TW	Yuan High-Tech Development	yuan-004	004	2022-01-14
1341	TW	Yuan High-Tech Development	yuan-005	005	2022-06-22
1342	TW	Yuan High-Tech Development	yuan-006	006	2022-12-14
1343	TW	Yuan High-Tech Development	yuan-007	007	2023-05-11
1344	TW	Yuan High-Tech Development	yuan-008	008	2023-11-06
1345	TW	Yuan High-Tech Development	yuan-009	009	2024-04-24
1346	TW	Yuan High-Tech Development	yuan-010	010	2024-10-22
1347	CN	Yuntu Data and Technology	ytu-000	000	2021-06-16
1348	CN	Zhuhai Yisheng Electronics Technology	yisheng-000	000	2017-08-17
1349	CN	Zhuhai Yisheng Electronics Technology	yisheng-001	001	2017-08-17
1350	CN	Zhuhai Yisheng Electronics Technology	yisheng-002	002	2018-02-01
1351	CN	Zhuhai Yisheng Electronics Technology	yisheng-004	004	2018-06-12
1352	IN	i2v Systems	i2v-001	001	2024-03-11
1353	IN	i2v Systems	i2v-002	002	2025-01-15
1354	VN	iCOMM Media and Tech	icomm-000	000	2023-12-26
1355	CN	iQIYI Inc	iqface-000	000	2019-06-04
1356	CN	iQIYI Inc	iqface-001	001	2019-12-11
1357	CN	iQIYI Inc	iqface-003	003	2021-02-23
1358	TW	iSAP Solution Corporation	isap-001	001	2019-08-07
1359	TW	iSAP Solution Corporation	isap-002	002	2020-09-01
1360	TW	ioNetworks Inc	ionetworks-000	000	2021-07-20
1361	TW	ioNetworks Inc	ionetworks-001	001	2023-08-01
1362	TW	ioNetworks Inc	ionetworks-002	002	2023-12-08
1363	TW	ioNetworks Inc	ionetworks-003	003	2024-05-09
1364	KR	useB	useb-000	000	2023-05-08
1365	KR	useB	useb-001	001	2023-09-12
1366	KR	useB	useb-002	002	2024-01-19
1367	KR	useB	useb-003	003	2024-08-09
1368	KR	useB	useb-004	004	2024-12-23

Table 20: Summary of participant information included in this report.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1	2060io-001	567279	43224	218 629	1356 10488 ± 0	988 958 ± 22	710 983 ± 38	716 1045 ± 205	1010 1724 ± 310	1011 3474 ± 1170	1052 7105 ± 42	1048 7071 ± 47
2	2060io-002	579607	42980	588 1559	1355 10488 ± 0	339 398 ± 0	224 418 ± 1	285 525 ± 1	464 786 ± 1	-	1048 7000 ± 91	1042 6965 ± 85
3	20face-000	117155	324083	546 1417	781 2048 ± 0	157 232 ± 1	90 223 ± 1	72 226 ± 4	57 222 ± 1	40 224 ± 1	1283 44880 ± 134	1282 44462 ± 163
4	20face-001	226824	324119	571 1512	1172 4096 ± 0	197 279 ± 2	109 266 ± 1	85 266 ± 1	74 267 ± 1	55 267 ± 0	998 5553 ± 54	996 5541 ± 65
5	3divi-000	169360	139460	-	129 512 ± 0	208 285 ± 52	-	-	-	-	107 378 ± 20	111 375 ± 19
6	3divi-001	190867	139473	-	1181 4096 ± 0	192 274 ± 47	-	-	-	-	231 636 ± 19	242 634 ± 16
7	3divi-002	190867	175117	-	1179 4096 ± 0	199 279 ± 48	-	-	-	-	262 692 ± 22	287 707 ± 26
8	3divi-003	191636	55903	-	1206 4096 ± 0	637 650 ± 90	-	-	-	-	220 627 ± 11	229 623 ± 32
9	3divi-004	263670	50794	-	695 2048 ± 0	1014 984 ± 131	-	-	-	-	316 794 ± 35	328 801 ± 40
10	3divi-005	264098	53870	-	841 2048 ± 0	1023 993 ± 83	821 1136 ± 88	923 1309 ± 137	877 1348 ± 131	904 1671 ± 166	314 790 ± 20	320 791 ± 23
11	3divi-006	273866	52656	490 1252	705 2048 ± 0	647 654 ± 1	428 651 ± 0	402 660 ± 1	373 678 ± 2	362 759 ± 13	308 775 ± 19	314 770 ± 22
12	3divi-007	483115	24723	503 1288	812 2048 ± 0	595 615 ± 1	389 616 ± 1	362 623 ± 1	339 644 ± 1	340 727 ± 5	274 707 ± 31	291 712 ± 25
13	accurascan-001	14057	24437	365 944	103 512 ± 0	134 204 ± 27	86 215 ± 17	69 220 ± 16	65 237 ± 18	79 339 ± 19	1168 15634 ± 54	1170 15647 ± 77
14	accurascan-002	14057	24437	367 945	121 512 ± 0	96 173 ± 23	65 188 ± 14	56 191 ± 14	50 208 ± 16	66 317 ± 14	1132 12255 ± 69	1134 12231 ± 72
15	accurascan-003	998397	27018	687 1996	801 2048 ± 0	677 676 ± 1	455 677 ± 7	441 700 ± 8	434 751 ± 16	491 950 ± 47	161 540 ± 10	164 536 ± 10
16	acer-000	109735	88323	-	919 2048 ± 0	150 222 ± 0	96 233 ± 4	77 238 ± 4	71 262 ± 18	88 356 ± 46	403 1065 ± 40	427 1109 ± 35
17	acer-001	36650	66086	124 417	127 512 ± 0	130 199 ± 0	97 237 ± 28	74 229 ± 26	67 242 ± 37	51 259 ± 21	744 2453 ± 44	749 2461 ± 62
18	acer-002	43922	624858	68 192	672 2048 ± 0	111 184 ± 0	62 184 ± 0	48 185 ± 0	39 185 ± 0	28 186 ± 0	865 3370 ± 47	870 3350 ± 54
19	acisw-003	282029	35664	-	1361 18467 ± 8	156 232 ± 1	111 267 ± 22	253 488 ± 28	603 990 ± 24	1000 2977 ± 129	1364 847908 ± 16757	1364 851850 ± 17018
20	acisw-006	282029	36107	-	1360 18465 ± 8	148 219 ± 0	94 227 ± 0	183 410 ± 1	501 838 ± 1	981 2532 ± 10	1360 548137 ± 16513	1360 549586 ± 9238
21	acisw-007	267619	36111	84 287	582 2048 ± 0	205 283 ± 0	129 293 ± 3	186 414 ± 0	160 404 ± 0	164 484 ± 1	483 1316 ± 22	488 1297 ± 23
22	acisw-008	171703	39359	437 1102	476 2048 ± 0	343 400 ± 1	178 362 ± 28	151 369 ± 9	92 300 ± 2	75 336 ± 5	485 1327 ± 19	495 1337 ± 32
23	adera-001	0	79272	-	1097 2560 ± 0	40 97 ± 0	-	-	-	-	564 1604 ± 71	575 1649 ± 56
24	adera-002	0	749797	-	1307 5120 ± 0	1294 1394 ± 11	985 1381 ± 1	977 1393 ± 1	924 1403 ± 1	835 1464 ± 2	686 2163 ± 32	686 2158 ± 28
25	adera-003	0	749778	356 917	1305 5120 ± 0	1280 1381 ± 12	987 1385 ± 1	980 1394 ± 1	919 1401 ± 1	837 1469 ± 1	684 2148 ± 34	681 2130 ± 32
26	adera-004	0	959123	638 1748	1319 6144 ± 0	1205 1246 ± 1	877 1204 ± 1	861 1230 ± 2	774 1207 ± 2	694 1254 ± 1	622 1840 ± 34	623 1828 ± 31
27	adera-005	0	959113	632 1734	1317 6144 ± 0	939 914 ± 1	621 879 ± 3	577 880 ± 2	532 886 ± 2	468 910 ± 2	637 1896 ± 14	634 1874 ± 20
28	advance-002	257173	20434	-	743 2048 ± 0	832 811 ± 2	562 803 ± 2	435 696 ± 2	392 699 ± 4	330 718 ± 1	372 987 ± 10	377 988 ± 45
29	advance-003	258867	78699	168 518	343 2048 ± 0	548 586 ± 0	-	326 583 ± 0	291 588 ± 0	236 591 ± 1	621 1813 ± 17	614 1788 ± 26
30	advance-004	803133	954494	241 681	622 2048 ± 0	1093 1099 ± 20	796 1107 ± 15	753 1093 ± 21	685 1103 ± 21	622 1138 ± 21	647 1935 ± 35	652 1936 ± 32
31	advance-005	277607	126218	214 624	880 2048 ± 0	526 573 ± 1	352 574 ± 2	317 573 ± 2	278 574 ± 2	245 601 ± 2	548 1517 ± 16	550 1518 ± 26
32	affinsys-ai-000	38016	46159	42 142	144 512 ± 0	14 48 ± 0	11 52 ± 0	23 106 ± 0	19 110 ± 0	32 194 ± 0	658 2007 ± 25	661 2006 ± 28
33	afisbiometrics-000	545886	32882	427 1085	122 512 ± 0	1185 1219 ± 1	819 1135 ± 1	790 1137 ± 2	720 1137 ± 1	628 1147 ± 1	503 1400 ± 29	501 1357 ± 32
34	afrengine-000	151875	382842	60 178	1131 4096 ± 0	50 107 ± 0	31 112 ± 0	94 284 ± 2	391 697 ± 2	1009 3299 ± 17	1304 54329 ± 140	1305 56195 ± 256
35	afrengine-001	410712	391289	388 1015	1157 4096 ± 0	1002 970 ± 0	709 982 ± 1	654 979 ± 2	608 996 ± 0	514 990 ± 4	1303 54240 ± 169	1304 56125 ± 179
36	afrengine-002	579618	239125	391 1018	361 2048 ± 0	880 851 ± 3	765 1065 ± 16	671 993 ± 7	512 855 ± 5	437 857 ± 9	467 1259 ± 13	480 1270 ± 23
37	afrengine-003	579563	239117	389 1017	874 2048 ± 0	1088 1088 ± 1	642 911 ± 15	739 1067 ± 5	495 833 ± 3	513 989 ± 2	479 1294 ± 48	485 1284 ± 29
38	afrengine-004	579587	239117	390 1018	687 2048 ± 0	905 875 ± 2	677 951 ± 119	694 1018 ± 5	539 895 ± 1	549 1043 ± 6	464 1254 ± 17	476 1258 ± 23
39	afrengine-005	694908	239155	392 1018	920 2048 ± 0	859 831 ± 10	697 972 ± 52	544 834 ± 2	535 891 ± 9	572 1065 ± 1	472 1276 ± 19	481 1273 ± 20
40	aifirst-001	224157	808777	149 485	907 2048 ± 0	551 587 ± 2	348 568 ± 2	327 584 ± 3	299 601 ± 6	359 755 ± 5	417 1099 ± 14	422 1087 ± 45
41	aigen-001	256958	595227	455 1154	539 2048 ± 0	1325 1448 ± 9	1034 1451 ± 8	1055 1759 ± 6	1060 2594 ± 4	1040 5691 ± 44	908 3772 ± 57	907 3736 ± 56
42	aigen-002	205300	1316138	350 896	541 2048 ± 0	546 586 ± 24	360 582 ± 4	602 920 ± 4	1015 1758 ± 5	1037 5427 ± 17	897 3678 ± 44	899 3646 ± 48
43	aigroup-000	357973	390046	118 398	380 2048 ± 0	282 351 ± 0	157 337 ± 1	138 353 ± 1	120 356 ± 1	106 385 ± 1	1095 9603 ± 216	1097 9689 ± 373
44	aigroup-001	298974	390068	194 587	493 2048 ± 0	486 535 ± 0	315 531 ± 0	288 533 ± 0	257 544 ± 5	239 595 ± 0	1089 9526 ± 170	1092 9562 ± 213

Notes	
1	The configuration size does not capture static data included in libraries.
2	The library size is the combined total of all files provided in the submission lib folder. These libraries e.g. OpenCV may or may not be installed on any end user's platform natively and would not need to be installed with the algorithm. Some developers put neural network models in their libraries.
3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 21: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE							COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
45	ailabs-001	1054663	338989	[489]1252	[574]2048 ± 0	[658]664 ± 4	[541]774 ± 50	[798]1145 ± 12	[1034]1972 ± 74	[1034]5205 ± 272	[1348]104034 ± 661	[1348]103415 ± 7722
46	aimall-001	128820	57257	-	[230]1024 ± 0	[256]326 ± 1	-	-	-	-	[933]4127 ± 72	[920]3909 ± 166
47	aimall-002	370156	25210	[593]1576	[526]2048 ± 0	[792]776 ± 4	[660]927 ± 27	[618]940 ± 21	[577]955 ± 34	[527]1003 ± 75	[1333]72811 ± 7399	[1329]71216 ± 6286
48	aimall-003	504324	171935	[672]1913	[228]1024 ± 0	[656]662 ± 1	[511]740 ± 51	[486]752 ± 62	[428]741 ± 46	[399]807 ± 47	[1262]34565 ± 93	[1264]34598 ± 118
49	aiseemu-001	0	1005354	[791]2701	[1189]4096 ± 0	[1028]1001 ± 1	[736]1017 ± 0	[690]1014 ± 5	[635]1022 ± 2	[566]1059 ± 4	[967]4864 ± 25	[971]4855 ± 32
50	aiseemu-002	0	1216980	[854]3453	[1154]4096 ± 0	[1238]1298 ± 5	[945]1303 ± 4	[926]1313 ± 2	[869]1329 ± 0	[759]1348 ± 2	[972]4917 ± 37	[973]4916 ± 37
51	aiunionface-000	241642	840295	[119]402	[884]2048 ± 0	[627]637 ± 13	[528]754 ± 41	[697]1025 ± 28	[753]1179 ± 29	[898]1639 ± 47	[406]1072 ± 19	[417]1080 ± 47
52	aize-001	268456	168970	[580]1546	[394]2048 ± 0	[388]437 ± 10	[246]440 ± 8	[299]542 ± 17	[437]756 ± 27	[887]1583 ± 53	[649]1937 ± 22	[643]1919 ± 23
53	aize-002	257106	182517	[193]586	[467]2048 ± 0	[418]467 ± 1	[276]479 ± 1	[490]756 ± 1	[972]1477 ± 1	[1027]4617 ± 41	[184]597 ± 16	[203]598 ± 14
54	aize-003	257130	33045	[180]546	[882]2048 ± 0	[115]187 ± 0	[66]188 ± 0	[45]182 ± 0	[37]183 ± 0	[33]195 ± 0	[215]621 ± 37	[194]592 ± 1
55	ajou-001	363257	31734	[134]442	[592]2048 ± 0	[476]530 ± 0	[320]536 ± 0	[291]535 ± 0	[264]549 ± 0	[230]577 ± 0	[186]597 ± 19	[199]596 ± 13
56	alchera-000	258450	18848	-	[637]2048 ± 0	[552]587 ± 13	[484]706 ± 48	[973]1389 ± 58	[1063]2722 ± 123	[1055]9011 ± 455	[846]3189 ± 32	[837]3031 ± 142
57	alchera-001	174013	18848	-	[832]2048 ± 0	[613]627 ± 11	-	-	-	-	[862]3342 ± 81	[861]3243 ± 47
58	alchera-002	405409	22275	-	[461]2048 ± 0	[998]968 ± 1	[700]976 ± 2	[655]979 ± 1	[601]988 ± 1	[540]1025 ± 2	[879]3488 ± 63	[880]3430 ± 63
59	alchera-003	487718	24613	[537]1376	[664]2048 ± 0	[883]854 ± 3	[605]862 ± 2	[569]870 ± 1	[528]882 ± 2	[472]918 ± 1	[872]3426 ± 57	[874]3383 ± 53
60	alchera-004	1001019	388616	[496]1271	[911]2048 ± 0	[1005]975 ± 0	[681]955 ± 0	[640]960 ± 0	[602]989 ± 0	[630]1152 ± 1	[885]3529 ± 54	[892]3530 ± 63
61	alchera-005	1001019	388616	[497]1272	[573]2048 ± 0	[1000]969 ± 1	[715]987 ± 3	[661]985 ± 3	[612]998 ± 0	[638]1162 ± 2	[876]3481 ± 59	[878]3422 ± 57
62	alchera-006	1000967	493456	[550]1426	[581]2048 ± 0	[470]522 ± 2	[323]540 ± 3	[301]544 ± 2	[275]569 ± 3	[350]739 ± 3	[700]2233 ± 38	[705]2253 ± 77
63	alchera-007	1000948	493456	[555]1430	[866]2048 ± 0	[475]530 ± 2	[337]556 ± 2	[311]566 ± 2	[281]581 ± 2	[364]762 ± 4	[691]2178 ± 35	[689]2169 ± 44
64	alchera-008	1002024	493460	[556]1430	[448]2048 ± 0	[555]589 ± 3	[344]563 ± 4	[355]614 ± 3	[310]614 ± 1	[401]810 ± 3	[980]5129 ± 35	[1118]11226 ± 120
65	alchera-009	2086479	454616	[805]2763	[755]2048 ± 0	[1346]1486 ± 4	[1052]1507 ± 4	[1005]1438 ± 9	[983]1508 ± 11	[936]2008 ± 4	[710]2284 ± 44	[710]2278 ± 69
66	alfabeta-001	128232	21780	[17]74	[135]512 ± 0	[188]271 ± 0	[119]276 ± 0	[228]459 ± 2	[530]886 ± 2	[982]2547 ± 9	[134]470 ± 25	[137]458 ± 20
67	alice-000	1741293	19355	[844]3329	[1200]4096 ± 0	[978]950 ± 2	[665]933 ± 1	[628]949 ± 1	[631]1011 ± 3	[700]1264 ± 8	[1158]14975 ± 201	[1160]14890 ± 229
68	alice-001	1428001	17074	[246]690	[662]2048 ± 0	[1084]1080 ± 1	[768]1075 ± 0	[758]1095 ± 1	[724]1143 ± 1	[819]1435 ± 1	[1206]21885 ± 278	[1211]21921 ± 265
69	alleyes-000	507636	997090	[333]857	[681]2048 ± 0	[800]784 ± 1	[695]970 ± 61	[650]974 ± 62	[569]943 ± 69	[561]1057 ± 23	[480]1298 ± 34	[490]1303 ± 51
70	allgovision-000	172509	155862	[186]561	[575]2048 ± 0	[322]384 ± 8	[207]395 ± 17	[185]413 ± 14	[207]471 ± 14	[322]710 ± 21	[1244]29903 ± 406	[1245]29735 ± 194
71	alphaface-001	259849	81636	[171]527	[427]2048 ± 0	[588]612 ± 1	[384]613 ± 3	[349]612 ± 1	[316]619 ± 1	[273]640 ± 2	[380]1008 ± 10	[387]1002 ± 19
72	alphaface-002	768995	70692	[557]1434	[557]2048 ± 0	[614]628 ± 2	[518]746 ± 19	[483]751 ± 18	[455]779 ± 22	[410]828 ± 40	[360]945 ± 25	[366]935 ± 17
73	alttekglobal-000	649718	3060239	[237]673	[328]2048 ± 0	[1076]1066 ± 2	[841]1158 ± 2	[829]1184 ± 1	[743]1168 ± 1	[662]1204 ± 2	[493]1370 ± 23	[505]1377 ± 26
74	amplifiedgroup-001	0	47053	[19]81	[199]866 ± 2	[36]93 ± 0	-	-	-	-	[1312]57803 ± 4210	[1306]56365 ± 1196
75	androvideo-000	174847	585063	[121]405	[464]2048 ± 0	[195]277 ± 0	[125]285 ± 0	[111]314 ± 0	[132]372 ± 1	[258]620 ± 0	[808]2860 ± 28	[808]2847 ± 22
76	anke-000	323402	39031	-	[1060]2072 ± 0	[517]566 ± 12	-	-	-	-	[170]567 ± 20	[167]545 ± 29
77	anke-001	642061	37364	-	[1062]2072 ± 0	[493]541 ± 4	-	-	-	-	[160]540 ± 16	[162]530 ± 20
78	anke-002	798686	28364	-	[1061]2072 ± 0	[366]419 ± 30	-	-	-	-	[149]501 ± 17	[150]492 ± 17
79	anke-003	340160	198638	-	[1017]2056 ± 0	[833]811 ± 23	-	-	-	-	[117]425 ± 28	[128]437 ± 32
80	anke-004	349388	410776	[249]706	[999]2056 ± 0	[609]625 ± 1	[404]627 ± 2	[382]635 ± 3	[348]653 ± 2	[508]982 ± 8	[225]633 ± 22	[239]632 ± 34
81	anke-005	328553	429160	[447]1134	[1042]2056 ± 0	[556]590 ± 2	[371]594 ± 5	[340]601 ± 3	[335]638 ± 4	[407]821 ± 24	[257]685 ± 19	[273]687 ± 26
82	antheus-000	119453	41994	[30]116	[167]520 ± 0	[51]109 ± 1	[64]187 ± 1	[53]189 ± 1	[43]195 ± 1	[43]236 ± 2	[1044]6901 ± 268	[1041]6936 ± 103
83	antheus-001	119453	41962	[31]118	[164]520 ± 0	[58]120 ± 1	[107]265 ± 13	[239]468 ± 22	[788]1223 ± 27	[984]2660 ± 87	[1027]6218 ± 47	[1022]6216 ± 45
84	antheus-002	271192	189635	[338]875	[497]2048 ± 0	[1098]1104 ± 1	[822]1138 ± 1	[793]1140 ± 1	[722]1142 ± 0	[680]1240 ± 1	[326]817 ± 5	[335]824 ± 16
85	anyvision-001	662659	518032	-	[245]1024 ± 0	[167]244 ± 0	-	-	-	-	[1338]74285 ± 212	[1337]74145 ± 200
86	anyvision-002	662659	520039	-	[234]1024 ± 0	[171]248 ± 0	-	-	-	-	[1337]74069 ± 188	[1336]74019 ± 198
87	anyvision-004	401001	630797	[438]1102	[214]1024 ± 0	[285]355 ± 1	-	-	-	-	[636]1891 ± 51	[625]1829 ± 85
88	anyvision-005	190979	116595	[406]1048	[220]1024 ± 0	[1015]985 ± 1	[724]997 ± 1	[684]1004 ± 1	[607]995 ± 1	[519]995 ± 1	[292]733 ± 14	[304]733 ± 16

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Table 22: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE							COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
89	aratek-001	254521	15993	708 2135	627 2048 ± 0	175 251 ± 1	118 275 ± 0	83 252 ± 0	79 278 ± 0	59 286 ± 0	605 1776 ± 20	603 1744 ± 38
90	armatura-001	0	374608	859 3518	425 2048 ± 0	699 688 ± 1	467 689 ± 1	433 693 ± 1	402 708 ± 3	360 756 ± 13	63 270 ± 17	71 268 ± 11
91	armatura-002	0	1258644	483 1222	1316 6144 ± 0	1339 1476 ± 3	1039 1458 ± 5	1044 1535 ± 5	982 1505 ± 12	891 1605 ± 26	565 1605 ± 26	566 1589 ± 25
92	armatura-003	0	836082	592 1572	1314 6144 ± 0	1051 1028 ± 1	749 1032 ± 1	700 1027 ± 0	641 1036 ± 1	547 1041 ± 3	1301 51850 ± 56	1301 51835 ± 48
93	arvis-000	529004	705484	340 878	236 1024 ± 0	139 209 ± 5	85 215 ± 1	128 342 ± 4	350 655 ± 13	952 2158 ± 55	877 3484 ± 41	883 3461 ± 48
94	asr-000	461347	236001	370 951	1012 2056 ± 0	396 450 ± 0	267 462 ± 1	221 454 ± 0	188 453 ± 1	167 486 ± 0	461 1226 ± 14	474 1251 ± 23
95	asr-001	461347	236016	369 949	1005 2056 ± 0	719 701 ± 0	485 706 ± 0	444 704 ± 0	403 709 ± 0	395 800 ± 0	652 1951 ± 28	660 1982 ± 23
96	asusaics-000	257418	245320	204 605	583 2048 ± 0	439 484 ± 13	303 506 ± 21	555 850 ± 26	1019 1789 ± 61	1043 6305 ± 188	989 5455 ± 78	990 5422 ± 112
97	asusaics-001	257418	245330	199 595	1146 4096 ± 0	873 842 ± 17	732 1008 ± 20	969 1377 ± 28	1057 2423 ± 90	1051 7284 ± 277	1082 8618 ± 42	1082 8638 ± 136
98	autentika-000	266093	3200425	673 1922	532 2048 ± 0	505 553 ± 1	376 605 ± 1	346 609 ± 2	302 608 ± 1	256 618 ± 2	1334 72833 ± 577	1330 71829 ± 541
99	autentika-001	0	3198534	611 1650	326 2048 ± 0	693 683 ± 2	643 912 ± 4	593 908 ± 3	551 919 ± 3	460 893 ± 4	1330 71804 ± 600	1328 70747 ± 582
100	autentika-002	0	3198136	616 1676	488 2048 ± 0	311 374 ± 1	304 511 ± 1	286 528 ± 1	249 534 ± 1	214 546 ± 1	1291 46941 ± 1172	1287 46351 ± 822
101	autentika-003	0	3198136	610 1648	773 2048 ± 0	386 437 ± 7	391 617 ± 14	328 584 ± 3	306 611 ± 8	252 614 ± 2	1293 47827 ± 1020	1289 46728 ± 916
102	authenmetric-002	449944	91489	-	417 2048 ± 0	964 942 ± 1	676 950 ± 1	642 960 ± 1	581 960 ± 1	515 991 ± 2	586 1712 ± 20	595 1719 ± 19
103	authenmetric-003	293599	39492	336 866	505 2048 ± 0	1022 992 ± 1	729 1006 ± 1	683 1003 ± 2	617 1002 ± 1	545 1036 ± 1	600 1757 ± 19	604 1755 ± 19
104	authenmetric-004	381165	39492	481 1214	520 2048 ± 0	933 910 ± 1	641 909 ± 1	596 915 ± 1	552 921 ± 2	490 950 ± 1	591 1724 ± 14	584 1691 ± 29
105	authme-001	1015124	37791	703 2097	1213 4096 ± 0	977 949 ± 1	693 969 ± 7	641 960 ± 6	582 961 ± 1	498 966 ± 4	802 2836 ± 34	804 2827 ± 54
106	authme-002	1016682	37819	698 2079	1130 4096 ± 0	989 959 ± 1	687 959 ± 7	676 995 ± 5	589 966 ± 5	511 985 ± 6	796 2796 ± 14	795 2775 ± 34
107	aware-000	240240	27639	-	304 1572 ± 0	650 655 ± 26	-	-	-	-	928 4030 ± 83	830 2984 ± 152
108	aware-001	240240	27639	-	307 1572 ± 0	652 656 ± 26	-	-	-	-	818 2902 ± 51	803 2810 ± 111
109	aware-002	271312	36134	-	306 1572 ± 0	537 582 ± 14	-	-	-	-	324 810 ± 32	332 812 ± 28
110	aware-003	377729	27975	-	1116 3108 ± 0	799 783 ± 10	-	-	-	-	499 1392 ± 42	493 1334 ± 80
111	aware-004	427829	28219	-	1070 2084 ± 0	924 900 ± 10	793 1105 ± 10	859 1226 ± 25	999 1585 ± 72	998 2937 ± 166	474 1279 ± 50	486 1287 ± 100
112	aware-005	300017	26320	494 1265	305 1572 ± 0	917 886 ± 23	753 1038 ± 21	779 1121 ± 22	871 1337 ± 58	953 2195 ± 144	530 1475 ± 63	518 1427 ± 115
113	aware-006	298543	14124	364 944	73 352 ± 0	1129 1148 ± 3	832 1146 ± 2	830 1190 ± 2	848 1306 ± 20	913 1754 ± 84	768 2598 ± 42	767 2559 ± 60
114	aware-007	135312	18711	116 388	83 480 ± 0	733 713 ± 1	495 716 ± 1	468 731 ± 3	462 785 ± 8	523 999 ± 30	395 1058 ± 23	423 1091 ± 37
115	aware-008	135312	18715	115 387	84 480 ± 0	767 751 ± 1	510 737 ± 0	476 739 ± 3	489 825 ± 9	530 1007 ± 27	427 1120 ± 25	448 1152 ± 35
116	awiros-001	15499	87480	22 88	146 512 ± 0	41 97 ± 6	25 98 ± 4	30 138 ± 6	59 225 ± 7	222 556 ± 8	410 1079 ± 44	407 1050 ± 45
117	awiros-002	289016	203723	183 556	415 2048 ± 0	431 479 ± 0	297 500 ± 0	290 534 ± 0	315 618 ± 0	487 946 ± 1	654 1966 ± 31	656 1957 ± 25
118	awiros-003	292302	598824	375 976	904 2048 ± 0	377 428 ± 2	248 442 ± 1	222 454 ± 2	181 442 ± 1	141 444 ± 1	763 2558 ± 20	769 2580 ± 42
119	awiros-004	489913	598874	507 1295	547 2048 ± 0	454 502 ± 0	309 517 ± 0	278 519 ± 3	240 518 ± 1	187 512 ± 0	756 2527 ± 17	763 2537 ± 20
120	aximetria-001	408902	487912	766 2539	384 2048 ± 0	1038 1013 ± 1	740 1023 ± 21	704 1029 ± 5	614 999 ± 2	588 1091 ± 5	945 4401 ± 94	947 4490 ± 80
121	ayftech-001	195423	43580	268 731	89 512 ± 0	355 408 ± 23	273 476 ± 52	522 814 ± 108	1021 1827 ± 384	1036 5412 ± 1029	208 615 ± 16	351 885 ± 44
122	ayftech-003	526164	127257	606 1640	485 2048 ± 0	1029 1003 ± 5	737 1017 ± 6	687 1006 ± 6	628 1009 ± 7	570 1063 ± 5	482 1301 ± 20	489 1300 ± 25
123	ayonix-000	58505	5252	14 69	262 1036 ± 0	2 18 ± 2	-	-	-	-	214 621 ± 23	227 620 ± 26
124	beethedata-000	227849	1087592	184 557	584 2048 ± 0	414 465 ± 0	270 467 ± 0	237 468 ± 0	205 467 ± 0	155 467 ± 0	678 2121 ± 34	678 2110 ± 38
125	betaface-000	0	1060599	-	1077 2116 ± 0	868 837 ± 9	-	-	-	-	546 1514 ± 28	551 1520 ± 66
126	betaface-002	0	1060599	-	1076 2116 ± 0	894 870 ± 13	-	-	-	-	529 1474 ± 50	543 1488 ± 41
127	beyneai-000	256958	591433	688 1998	377 2048 ± 0	399 451 ± 8	255 449 ± 1	497 767 ± 7	1001 1603 ± 25	1029 4669 ± 124	902 3730 ± 57	901 3668 ± 54
128	biocube-001	25030	6192987	139 457	1166 4096 ± 0	203 282 ± 22	128 292 ± 24	283 521 ± 57	377 684 ± 59	710 1282 ± 68	1205 21787 ± 96	1209 21812 ± 109
129	biocube-002	69898	10651580	145 468	1177 4096 ± 0	854 826 ± 4	589 838 ± 4	819 1175 ± 4	1066 2933 ± 1074	1056 9144 ± 1090	1217 23074 ± 94	1219 23036 ± 99
130	bioid-001	361549	144	217 629	1341 7680 ± 0	118 190 ± 1	71 192 ± 1	96 290 ± 2	266 556 ± 7	871 1528 ± 25	977 5051 ± 35	980 5042 ± 19
131	bioid-002	364015	149	544 1415	1342 7680 ± 0	116 187 ± 2	69 190 ± 3	99 295 ± 4	270 560 ± 13	896 1630 ± 43	978 5052 ± 34	979 5031 ± 23
132	bioid-003	530171	156	587 1558	1358 15368 ± 0	538 582 ± 2	364 587 ± 2	448 706 ± 3	606 994 ± 7	946 2123 ± 33	1032 6396 ± 25	1028 6377 ± 29

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3	The memory usage is the peak resident set size reported by the ps system call during template generation.
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Table 23: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
133	bioidtechswiss-000	758466	119955	-	31 256 ± 0	618 630 ± 2	-	-	-	-	1261 34416 ± 137	1263 34403 ± 126
134	bioidtechswiss-001	1178769	120811	560 1455	97 512 ± 0	997 966 ± 4	924 1270 ± 270	914 1294 ± 96	929 1409 ± 157	918 1793 ± 79	769 2610 ± 25	772 2624 ± 32
135	bioidtechswiss-002	744786	114842	381 990	90 512 ± 0	945 917 ± 2	662 930 ± 2	631 952 ± 2	571 947 ± 3	563 1058 ± 11	690 2177 ± 29	690 2170 ± 31
136	bioidtechswiss-003	518317	10378	911 4730	512 2048 ± 0	1082 1075 ± 1	825 1139 ± 7	1071 2207 ± 9	1029 1891 ± 11	1032 4787 ± 21	1296 50218 ± 204	1297 50184 ± 163
137	biometric-vision-000	445487	72132	355 915	460 2048 ± 0	865 836 ± 3	583 831 ± 3	567 869 ± 5	578 955 ± 8	770 1370 ± 19	1150 14437 ± 161	1151 14325 ± 167
138	biometrik-001	23995	68818	27 101	120 512 ± 0	1322 1446 ± 3	1031 1448 ± 3	1016 1449 ± 3	956 1456 ± 3	850 1485 ± 3	381 1016 ± 5	382 999 ± 17
139	bm-001	287734	38076	47 148	1 64 ± 0	393 444 ± 88	-	-	-	-	635 1887 ± 31	636 1877 ± 26
140	boetech-001	261376	88710	866 3658	673 2048 ± 0	189 271 ± 1	112 268 ± 1	86 273 ± 0	82 286 ± 1	67 318 ± 1	1324 68519 ± 1921	1323 67648 ± 822
141	boetech-002	294347	88710	694 2057	621 2048 ± 0	232 305 ± 4	133 296 ± 1	102 302 ± 1	97 313 ± 1	85 348 ± 2	1326 68921 ± 2137	1327 69473 ± 2104
142	bresee-000	287880	22872	-	826 2048 ± 0	1246 1309 ± 1	1078 2126 ± 1	937 1330 ± 0	857 1312 ± 0	754 1333 ± 0	1284 45317 ± 228	1294 48256 ± 425
143	bresee-001	287880	23227	484 1223	395 2048 ± 0	1190 1223 ± 3	883 1216 ± 1	940 1331 ± 1	793 1227 ± 1	768 1360 ± 1	1270 37240 ± 655	1273 37167 ± 584
144	bresee-002	313627	30902	679 1951	784 2048 ± 0	762 743 ± 4	828 1143 ± 2	800 1146 ± 2	727 1148 ± 2	648 1176 ± 2	607 1778 ± 22	610 1775 ± 23
145	btsdigital-001	362015	234409	371 955	894 2048 ± 0	749 728 ± 2	493 713 ± 1	463 726 ± 4	410 716 ± 2	347 738 ± 0	840 3123 ± 22	846 3134 ± 37
146	cakevn-001	271412	587471	271 739	603 2048 ± 0	550 587 ± 0	362 584 ± 0	329 585 ± 0	292 589 ± 0	288 664 ± 0	1340 78258 ± 72	1338 78329 ± 90
147	camvi-001	118759	21678	-	238 1024 ± 0	107 181 ± 6	-	-	-	-	138 481 ± 16	148 487 ± 23
148	camvi-002	236278	225285	270 737	239 1024 ± 0	680 677 ± 7	503 726 ± 36	566 869 ± 28	710 1129 ± 43	992 2785 ± 113	205 612 ± 26	209 603 ± 20
149	camvi-003	285657	225320	-	248 1024 ± 0	766 750 ± 3	-	-	-	-	172 571 ± 23	175 565 ± 26
150	camvi-004	280733	615819	357 919	718 2048 ± 0	778 759 ± 10	604 861 ± 17	663 986 ± 34	837 1279 ± 51	997 2891 ± 158	361 948 ± 40	371 963 ± 31
151	candour-001	150086	97632	148 477	409 2048 ± 0	1298 1400 ± 1	999 1396 ± 1	991 1408 ± 1	928 1407 ± 1	836 1464 ± 1	1111 10725 ± 133	1112 10712 ± 127
152	candour-002	149560	65228	117 392	808 2048 ± 0	75 144 ± 0	41 143 ± 0	32 145 ± 0	29 152 ± 1	36 206 ± 0	1068 7798 ± 56	1068 7781 ± 51
153	candour-003	339247	65570	316 833	1110 3072 ± 0	318 380 ± 0	205 392 ± 0	158 378 ± 0	149 393 ± 1	143 445 ± 0	1260 34039 ± 45	1262 34020 ± 44
154	candour-004	1192219	65226	761 2490	1126 4096 ± 0	1367 2243 ± 0	1080 2247 ± 0	1072 2223 ± 0	1051 2270 ± 1	966 2330 ± 0	782 2714 ± 20	792 2755 ± 23
155	canon-002	446491	130232	-	1217 4096 ± 0	1245 1308 ± 2	955 1315 ± 1	934 1326 ± 2	875 1345 ± 1	831 1452 ± 1	1026 6211 ± 25	1020 6194 ± 25
156	canon-003	2550850	101378	927 5487	1322 6180 ± 0	1216 1263 ± 3	920 1263 ± 1	905 1283 ± 1	862 1320 ± 1	847 1482 ± 2	962 4783 ± 17	963 4780 ± 19
157	canon-004	2399160	114188	948 7037	1324 6200 ± 0	975 948 ± 4	682 955 ± 3	639 959 ± 3	592 977 ± 3	571 1064 ± 2	1056 7172 ± 63	1053 7169 ± 51
158	canon-005	2521818	80309	943 6700	1278 4148 ± 0	1189 1223 ± 21	888 1221 ± 2	862 1230 ± 4	798 1234 ± 5	751 1329 ± 3	1022 6142 ± 99	1023 6226 ± 146
159	cchonolulu-000	727461	37284	123 416	101 512 ± 0	62 123 ± 13	37 126 ± 10	29 129 ± 10	26 134 ± 10	39 223 ± 10	592 1726 ± 35	585 1697 ± 35
160	cchonolulu-001	733744	37284	127 426	517 2048 ± 0	88 162 ± 21	75 197 ± 23	274 513 ± 96	696 1118 ± 267	950 2142 ± 584	946 4418 ± 37	940 4361 ± 35
161	cdachyd-001	238593	1941345	37 135	88 512 ± 0	1354 1642 ± 2	1065 1749 ± 1	1083 6467 ± 3	1083 17252 ± 10	1074 58681 ± 45	1121 11594 ± 85	1126 11639 ± 130
162	ceiec-001	159618	46136	-	218 1024 ± 0	241 314 ± 3	-	-	-	-	1215 22831 ± 108	1218 22813 ± 120
163	ceiec-002	269063	90975	-	482 2048 ± 0	586 612 ± 17	-	-	-	-	692 2188 ± 57	716 2301 ± 56
164	ceiec-003	260371	88707	131 430	334 2048 ± 0	841 817 ± 4	625 883 ± 57	584 897 ± 60	541 899 ± 72	485 944 ± 72	704 2256 ± 38	701 2241 ± 54
165	ceiec-004	263476	67011	122 408	523 2048 ± 0	1045 1024 ± 1	743 1027 ± 1	701 1027 ± 1	639 1030 ± 1	558 1055 ± 1	624 1844 ± 26	626 1836 ± 20
166	celloscope-001	38016	59158	39 138	118 512 ± 0	15 49 ± 0	10 52 ± 0	52 188 ± 0	234 509 ± 1	-	788 2733 ± 35	788 2730 ± 35
167	chosun-000	167093	694	-	702 2048 ± 0	392 441 ± 1	-	-	-	-	370 983 ± 20	376 983 ± 29
168	chosun-001	765615	707	153 491	529 2048 ± 0	797 783 ± 2	576 826 ± 4	1052 1662 ± 13	1073 3679 ± 67	1068 11694 ± 243	376 998 ± 25	397 1035 ± 11
169	chosun-002	234001	31875	137 451	656 2048 ± 0	172 248 ± 3	115 273 ± 3	1036 1495 ± 14	1078 7920 ± 90	1075 80302 ± 1349	216 623 ± 17	243 634 ± 13
170	chtface-001	94088	369529	-	379 2048 ± 0	145 212 ± 10	-	-	-	-	703 2256 ± 26	703 2252 ± 91
171	chtface-002	363153	369529	-	901 2048 ± 0	542 584 ± 14	492 712 ± 41	711 1038 ± 42	1023 1861 ± 75	1028 4661 ± 232	707 2264 ± 26	700 2234 ± 103
172	chtface-003	363153	369529	-	510 2048 ± 0	564 594 ± 16	500 720 ± 33	720 1050 ± 41	1027 1884 ± 90	1038 5606 ± 334	676 2110 ± 37	696 2219 ± 65
173	chtface-004	409656	311027	552 1428	465 2048 ± 0	263 332 ± 0	148 323 ± 1	121 329 ± 1	112 335 ± 1	101 377 ± 1	593 1727 ± 17	596 1720 ± 16
174	chtface-005	408364	311100	543 1415	731 2048 ± 0	252 322 ± 0	141 316 ± 1	117 325 ± 2	105 324 ± 1	124 411 ± 2	640 1907 ± 19	640 1898 ± 23
175	chtface-006	733645	610439	747 2424	740 2048 ± 0	472 522 ± 1	306 514 ± 1	292 536 ± 2	271 561 ± 1	313 693 ± 2	663 2034 ± 41	670 2049 ± 29
176	chtface-007	733528	610443	741 2393	419 2048 ± 0	213 292 ± 0	126 290 ± 0	106 307 ± 1	108 328 ± 1	176 501 ± 1	558 1570 ± 53	561 1561 ± 34

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
177	chtface-008	810179	583222	959 8766	889 2048 ± 0	1063 1043 ± 8	738 1019 ± 9	695 1022 ± 14	645 1039 ± 16	573 1066 ± 23	545 1513 ± 14	557 1535 ± 44
178	chtface-009	810179	342213	963 9371	595 2048 ± 0	1328 1455 ± 0	1041 1468 ± 16	1038 1501 ± 26	979 1501 ± 0	877 1544 ± 15	695 2213 ± 13	698 2226 ± 29
179	cib-000	340288	69515	-	367 2048 ± 0	1024 993 ± 40	-	-	-	-	1224 24340 ± 60	1234 25972 ± 97
180	cib-001	436253	133766	-	459 2048 ± 0	642 651 ± 2	487 707 ± 13	455 716 ± 15	417 728 ± 3	406 820 ± 5	909 3783 ± 38	910 3765 ± 37
181	cist-001	0	300551	191 582	413 2048 ± 0	1003 972 ± 0	704 977 ± 1	656 981 ± 0	597 983 ± 0	568 1061 ± 0	822 2947 ± 20	824 2940 ± 22
182	cist-002	0	1186073	629 1730	1122 3200 ± 0	1008 976 ± 0	719 992 ± 0	747 1085 ± 1	835 1279 ± 0	943 2101 ± 1	1024 6165 ± 22	1021 6207 ± 38
183	cist-003	0	1267350	792 2706	1311 5248 ± 0	1234 1291 ± 1	944 1300 ± 1	953 1352 ± 3	841 1287 ± 2	736 1313 ± 1	1069 7838 ± 63	1069 7823 ± 40
184	cist-004	0	1603990	771 2563	1310 5248 ± 0	1202 1243 ± 1	926 1271 ± 1	889 1264 ± 3	810 1252 ± 1	713 1287 ± 1	851 3216 ± 25	857 3220 ± 32
185	clearviewai-000	342491	211852	799 2745	772 2048 ± 0	1300 1402 ± 1	1001 1403 ± 1	996 1412 ± 1	937 1420 ± 1	804 1418 ± 1	562 1592 ± 37	562 1561 ± 37
186	clearviewai-001	613532	511807	526 1353	566 2048 ± 0	625 635 ± 2	422 642 ± 1	399 659 ± 1	358 664 ± 1	297 674 ± 1	330 827 ± 10	338 829 ± 20
187	clearviewai-002	713008	509504	584 1556	516 2048 ± 0	773 755 ± 2	539 773 ± 2	493 765 ± 3	459 783 ± 2	389 790 ± 1	338 864 ± 34	340 842 ± 29
188	clearviewai-003	712800	540093	518 1344	563 2048 ± 0	1101 1109 ± 0	782 1091 ± 0	749 1088 ± 0	678 1090 ± 0	613 1126 ± 0	797 2812 ± 45	805 2831 ± 50
189	closeli-001	420342	9851	286 773	1201 4096 ± 0	870 839 ± 1	593 843 ± 1	549 841 ± 1	504 845 ± 1	442 865 ± 1	988 5404 ± 17	989 5400 ± 25
190	cloudmatrix-000	309939	542141	-	375 2048 ± 0	772 754 ± 10	521 750 ± 2	487 754 ± 4	444 764 ± 1	392 793 ± 2	1294 49192 ± 206	1295 49275 ± 176
191	cloudmatrix-001	10390	542121	12 65	794 2048 ± 0	54 114 ± 1	32 117 ± 0	26 118 ± 0	23 123 ± 1	24 169 ± 1	1297 50263 ± 212	1298 50243 ± 237
192	cloudmatrix-002	256635	693318	403 1036	893 2048 ± 0	337 395 ± 1	213 398 ± 1	173 399 ± 1	157 402 ± 1	136 437 ± 20	1295 49578 ± 120	1296 49602 ± 180
193	cloudwalk-hr-000	284600	105489	-	1045 2057 ± 0	568 600 ± 2	-	-	-	-	1174 16747 ± 238	1177 16627 ± 220
194	cloudwalk-hr-001	346156	104483	-	1047 2057 ± 0	663 665 ± 3	-	-	-	-	1181 17816 ± 260	1186 17878 ± 464
195	cloudwalk-hr-002	390059	327494	-	1048 2057 ± 0	928 908 ± 3	-	-	-	-	1213 22530 ± 416	1207 21651 ± 533
196	cloudwalk-hr-003	383739	144263	378 983	1046 2057 ± 0	579 606 ± 0	367 588 ± 0	336 594 ± 0	307 612 ± 1	215 547 ± 2	1047 6982 ± 80	1044 6972 ± 84
197	cloudwalk-hr-004	502916	520169	541 1399	929 2049 ± 0	902 873 ± 1	619 877 ± 1	573 876 ± 1	526 879 ± 1	467 902 ± 3	1124 11652 ± 127	1124 11608 ± 123
198	cloudwalk-mt-000	372169	282036	-	930 2049 ± 0	744 724 ± 12	-	-	-	-	578 1678 ± 47	568 1614 ± 85
199	cloudwalk-mt-002	290753	145340	-	927 2049 ± 0	527 573 ± 1	497 717 ± 78	440 700 ± 66	432 749 ± 96	376 770 ± 80	1057 7205 ± 204	1054 7211 ± 244
200	cloudwalk-mt-003	490365	494959	-	921 2049 ± 0	951 923 ± 1	646 918 ± 1	611 926 ± 1	554 925 ± 1	482 936 ± 1	1123 11620 ± 179	1127 11661 ± 128
201	cloudwalk-mt-004	1384602	512628	-	397 2048 ± 0	953 923 ± 2	648 919 ± 1	600 918 ± 0	550 919 ± 0	477 927 ± 1	1125 11744 ± 170	1125 11631 ± 126
202	cloudwalk-mt-005	846026	573253	862 3615	613 2048 ± 0	1153 1179 ± 3	874 1200 ± 3	847 1209 ± 3	791 1226 ± 5	675 1229 ± 3	1139 12525 ± 225	1139 12394 ± 152
203	cloudwalk-mt-006	563322	480071	857 3499	737 2048 ± 0	1287 1385 ± 0	993 1392 ± 1	982 1398 ± 1	918 1397 ± 4	825 1444 ± 2	864 3364 ± 96	868 3324 ± 83
204	cloudwalk-mt-007	563322	480071	858 3499	527 2048 ± 0	1279 1379 ± 2	1018 1425 ± 7	1002 1427 ± 6	932 1417 ± 2	823 1443 ± 7	827 3000 ± 68	826 2971 ± 74
205	clova-000	198420	6824	-	442 2048 ± 0	385 437 ± 0	235 431 ± 0	205 435 ± 0	187 452 ± 2	185 508 ± 7	610 1794 ± 16	616 1795 ± 19
206	cmcuni-001	0	604227	464 1177	870 2048 ± 0	1138 1161 ± 1	863 1187 ± 1	835 1194 ± 5	767 1200 ± 1	664 1207 ± 1	843 3153 ± 22	850 3158 ± 26
207	codeline-000	361659	138388	476 1194	912 2048 ± 0	1327 1453 ± 0	1038 1456 ± 2	1020 1456 ± 0	958 1457 ± 0	848 1483 ± 1	687 2171 ± 69	693 2194 ± 84
208	cogent-000	633812	18848	-	79 439 ± 0	462 511 ± 7	-	-	-	-	1090 9541 ± 54	1089 9500 ± 51
209	cogent-001	530508	18869	-	81 455 ± 0	508 557 ± 7	-	-	-	-	1108 10477 ± 278	1110 10392 ± 75
210	cogent-002	696959	18881	-	317 1979 ± 0	961 941 ± 0	-	-	-	-	1149 14394 ± 134	1153 14385 ± 176
211	cogent-003	698290	40430	-	209 973 ± 0	986 952 ± 0	-	-	-	-	1137 12496 ± 75	1129 11822 ± 163
212	cogent-004	722919	389164	-	318 1983 ± 0	1017 987 ± 50	-	-	-	-	1167 15536 ± 75	1172 15964 ± 708
213	cogent-005	1876796	75276	-	1090 2523 ± 0	1187 1221 ± 2	898 1236 ± 1	907 1289 ± 2	936 1420 ± 4	890 1602 ± 5	1230 24854 ± 69	1229 24858 ± 71
214	cogent-006	1078167	58108	585 1557	269 1062 ± 0	785 768 ± 0	551 789 ± 1	540 831 ± 2	557 930 ± 1	502 971 ± 1	616 1802 ± 17	618 1797 ± 23
215	cogent-007	621565	72316	669 1888	185 550 ± 0	1256 1329 ± 2	968 1333 ± 5	944 1337 ± 4	881 1353 ± 5	789 1390 ± 4	97 355 ± 8	108 367 ± 14
216	cogent-008	856817	73587	714 2176	184 550 ± 0	1308 1412 ± 1	1017 1419 ± 2	1001 1426 ± 3	949 1437 ± 3	844 1476 ± 1	120 436 ± 14	129 441 ± 23
217	cognitec-000	474759	27371	-	953 2052 ± 0	151 224 ± 1	-	-	-	-	912 3835 ± 108	911 3782 ± 83
218	cognitec-001	476809	27487	-	941 2052 ± 0	215 293 ± 17	-	-	-	-	937 4253 ± 59	935 4102 ± 167
219	cognitec-002	394088	62354	-	963 2052 ± 0	121 192 ± 6	87 219 ± 6	76 233 ± 8	66 241 ± 6	65 314 ± 10	857 3250 ± 41	860 3241 ± 48
220	cognitec-003	471458	62502	305 817	949 2052 ± 0	302 366 ± 9	216 403 ± 9	182 408 ± 9	170 424 ± 9	186 509 ± 13	871 3417 ± 51	881 3433 ± 53

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	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
221	cognitec-004	705645	62678	189 580	945 2052 ± 0	411 463 ± 9	292 497 ± 9	270 504 ± 10	241 521 ± 10	262 631 ± 12	833 3028 ± 197	841 3059 ± 238
222	cognitec-005	326804	198231	308 819	952 2052 ± 0	238 311 ± 10	179 364 ± 12	152 370 ± 10	143 390 ± 10	174 498 ± 16	721 2332 ± 48	724 2330 ± 40
223	cognitec-006	368383	40008	321 844	896 2048 ± 0	269 335 ± 7	194 381 ± 8	169 390 ± 7	152 396 ± 8	149 455 ± 11	719 2316 ± 60	704 2252 ± 50
224	cognitec-007	368401	40132	322 844	916 2048 ± 0	406 458 ± 20	373 601 ± 17	400 660 ± 17	478 815 ± 23	826 1445 ± 45	667 2051 ± 26	668 2045 ± 34
225	compal-000	1003818	186200	725 2242	229 1024 ± 0	1211 1255 ± 1	938 1293 ± 2	916 1294 ± 2	845 1300 ± 2	742 1322 ± 4	1259 33116 ± 349	1261 33182 ± 252
226	compal-001	619796	186054	848 3395	922 2049 ± 0	888 861 ± 0	613 871 ± 0	557 851 ± 0	513 857 ± 0	456 887 ± 0	1352 149573 ± 724	1352 149664 ± 582
227	cor-001	1194948	11240	488 1249	1055 2060 ± 0	715 699 ± 3	607 863 ± 76	564 865 ± 80	519 872 ± 89	492 952 ± 39	1357 270145 ± 2259	1357 282686 ± 11788
228	coretech-000	186423	43964	93 318	124 512 ± 0	572 602 ± 15	432 659 ± 12	792 1139 ± 24	729 1149 ± 25	642 1165 ± 23	86 333 ± 14	88 321 ± 13
229	coretech-001	235361	305490	572 1523	856 2048 ± 0	697 688 ± 7	473 695 ± 7	568 870 ± 17	525 879 ± 15	450 877 ± 15	217 625 ± 25	251 641 ± 25
230	coretech-002	339881	296194	842 3300	578 2048 ± 0	408 459 ± 1	258 451 ± 1	556 851 ± 1	522 875 ± 2	507 980 ± 2	742 2443 ± 17	741 2436 ± 13
231	coretech-003	339885	296194	663 1861	771 2048 ± 0	838 815 ± 2	590 838 ± 3	898 1273 ± 6	836 1279 ± 8	774 1373 ± 6	736 2416 ± 13	738 2415 ± 19
232	coretech-004	339885	296194	657 1828	837 2048 ± 0	374 427 ± 1	251 443 ± 2	552 847 ± 4	514 858 ± 2	486 945 ± 4	738 2436 ± 35	740 2432 ± 20
233	corsight-001	1437763	31525	-	1056 2064 ± 0	1235 1291 ± 3	932 1285 ± 1	911 1293 ± 1	846 1303 ± 2	780 1379 ± 3	1356 249340 ± 1713	1356 248929 ± 1909
234	corsight-002	1474921	32093	670 1892	1068 2080 ± 0	1233 1290 ± 1	934 1287 ± 1	908 1290 ± 1	850 1307 ± 2	788 1388 ± 4	1231 24953 ± 637	1226 24263 ± 578
235	corsight-003	1413063	32198	607 1642	1064 2080 ± 0	1173 1202 ± 2	865 1190 ± 5	842 1199 ± 3	800 1236 ± 3	760 1349 ± 7	1241 28754 ± 434	1244 28279 ± 446
236	csc-001	0	240698	-	180 544 ± 0	226 302 ± 1	137 303 ± 0	104 304 ± 0	94 309 ± 1	81 341 ± 4	96 354 ± 8	103 344 ± 11
237	csc-002	0	519768	4 30	178 544 ± 0	426 473 ± 0	290 494 ± 0	246 481 ± 1	221 490 ± 1	191 514 ± 5	101 367 ± 11	110 371 ± 10
238	csc-003	0	400435	5 31	175 544 ± 0	451 499 ± 0	295 500 ± 1	266 502 ± 0	233 508 ± 1	204 535 ± 4	110 393 ± 8	120 397 ± 7
239	ctbcbank-000	257208	599238	188 570	515 2048 ± 0	522 568 ± 43	378 606 ± 38	429 690 ± 53	404 711 ± 50	415 831 ± 51	887 3551 ± 87	966 4805 ± 209
240	ctbcbank-001	275511	599238	201 603	381 2048 ± 0	644 652 ± 35	547 781 ± 30	572 875 ± 43	540 898 ± 51	542 1030 ± 47	917 3926 ± 45	921 3924 ± 56
241	ctbcbank-002	550523	253310	426 1084	116 512 ± 0	712 694 ± 0	486 707 ± 0	465 727 ± 0	431 744 ± 0	361 758 ± 0	958 4656 ± 146	993 5486 ± 179
242	cu-face-002	812008	38655	257 723	1195 4096 ± 0	1067 1054 ± 1	762 1059 ± 0	730 1060 ± 0	657 1063 ± 1	575 1070 ± 0	1311 57287 ± 1750	1310 57027 ± 945
243	cu-face-003	1015124	37791	705 2116	1128 4096 ± 0	972 945 ± 1	680 955 ± 3	636 957 ± 2	573 949 ± 3	496 963 ± 2	793 2769 ± 19	798 2782 ± 41
244	cu-face-004	1016682	37791	699 2083	1176 4096 ± 0	1042 1022 ± 1	747 1031 ± 1	679 998 ± 3	664 1070 ± 1	537 1021 ± 2	810 2884 ± 38	811 2864 ± 48
245	cubox-001	369627	75427	227 652	508 2048 ± 0	926 907 ± 1	637 902 ± 1	588 903 ± 0	549 917 ± 0	479 931 ± 0	496 1379 ± 37	513 1417 ± 38
246	cubox-002	542254	90975	682 1966	509 2048 ± 0	948 921 ± 1	653 921 ± 1	605 922 ± 1	560 933 ± 1	528 1003 ± 1	659 2008 ± 72	659 1969 ± 57
247	cubox-003	1694397	209684	856 3491	337 2048 ± 0	1156 1179 ± 0	864 1189 ± 0	841 1198 ± 0	776 1208 ± 0	701 1264 ± 1	711 2289 ± 112	713 2297 ± 68
248	cubox-004	1304512	209634	801 2747	535 2048 ± 0	993 963 ± 1	712 986 ± 1	669 992 ± 0	626 1008 ± 0	580 1087 ± 0	531 1476 ± 62	530 1460 ± 42
249	cubox-005	225237	209600	538 1387	388 2048 ± 0	297 362 ± 0	187 371 ± 0	154 373 ± 0	144 390 ± 0	147 453 ± 0	598 1748 ± 25	593 1718 ± 40
250	cudocommunication-001	385258	341277	424 1080	914 2048 ± 0	954 925 ± 1	655 923 ± 1	614 928 ± 1	559 932 ± 0	497 964 ± 1	758 2534 ± 20	764 2537 ± 20
251	cuhkee-001	787853	74917	764 2515	961 2052 ± 0	1009 977 ± 31	-	-	-	-	784 2719 ± 60	799 2783 ± 56
252	cybercore-000	86008	55441	-	95 512 ± 0	648 655 ± 3	466 689 ± 71	394 649 ± 6	344 648 ± 8	300 680 ± 6	1156 14800 ± 75	1171 15757 ± 782
253	cybercore-001	166096	7791	-	600 2048 ± 0	441 487 ± 0	285 486 ± 0	254 488 ± 0	219 487 ± 0	177 502 ± 0	1302 52119 ± 111	1302 52127 ± 111
254	cybercore-002	166096	7374	772 2565	447 2048 ± 0	443 489 ± 1	296 500 ± 4	265 500 ± 1	227 499 ± 2	201 528 ± 1	1136 12389 ± 123	1138 12352 ± 112
255	cybercore-003	289176	7969	896 4311	1207 4096 ± 0	874 844 ± 2	602 855 ± 4	563 864 ± 4	517 862 ± 4	452 878 ± 2	1005 5744 ± 41	1007 5737 ± 31
256	cyberextruder-001	121211	13629	-	32 256 ± 0	921 893 ± 25	-	-	-	-	411 1083 ± 16	416 1079 ± 19
257	cyberextruder-002	168909	13924	-	466 2048 ± 0	480 532 ± 6	-	-	-	-	617 1803 ± 14	612 1779 ± 22
258	cyberextruder-003	253300	12354	135 444	94 512 ± 0	332 390 ± 1	200 388 ± 1	171 393 ± 1	155 399 ± 1	134 435 ± 1	38 198 ± 4	38 189 ± 8
259	cyberextruder-004	169301	12354	91 302	8 128 ± 0	136 206 ± 0	81 208 ± 0	63 209 ± 0	62 229 ± 0	49 249 ± 1	24 145 ± 14	26 155 ± 14
260	cyberextruder-005	269610	45367	205 606	110 512 ± 0	93 168 ± 2	50 169 ± 1	61 205 ± 3	88 295 ± 5	425 835 ± 9	23 142 ± 8	24 144 ± 10
261	cyberextruder-006	184816	45435	114 382	37 256 ± 0	35 91 ± 1	20 89 ± 0	18 97 ± 0	15 95 ± 0	18 130 ± 1	9 98 ± 7	9 101 ± 11
262	cyberlink-000	221801	91440	-	977 2052 ± 0	272 338 ± 6	-	-	-	-	675 2102 ± 40	677 2093 ± 32
263	cyberlink-001	222009	91440	-	970 2052 ± 0	370 425 ± 29	-	-	-	-	666 2051 ± 32	673 2060 ± 31
264	cyberlink-002	222311	95086	-	980 2052 ± 0	651 656 ± 22	-	-	-	-	706 2264 ± 71	776 2649 ± 195

Notes	
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3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 26: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480X720	960X1440	1600X2400	3000X4500	GENUINE	IMPOSTOR
265	cyberlink-003	470949	104369	-	938 2052 ± 0	369 423 ± 1	-	-	-	-	728 2366 ± 38	729 2373 ± 45
266	cyberlink-004	340894	104662	-	1272 4140 ± 0	730 712 ± 1	-	-	-	-	901 3693 ± 51	918 3898 ± 71
267	cyberlink-005	341680	111358	-	1271 4140 ± 0	742 721 ± 1	524 752 ± 2	488 754 ± 2	436 755 ± 1	390 791 ± 3	899 3680 ± 37	933 4021 ± 97
268	cyberlink-006	341666	102456	-	1330 6212 ± 0	704 690 ± 1	480 702 ± 0	443 703 ± 0	406 712 ± 0	352 741 ± 0	64 270 ± 13	73 271 ± 13
269	cyberlink-007	380046	102446	-	1328 6212 ± 0	745 725 ± 1	507 732 ± 1	472 734 ± 1	426 736 ± 1	372 767 ± 1	77 304 ± 19	83 304 ± 16
270	cyberlink-008	380047	102470	-	1326 6212 ± 0	750 729 ± 1	501 725 ± 0	464 727 ± 0	423 732 ± 0	363 760 ± 0	60 263 ± 17	65 255 ± 13
271	cyberlink-009	588443	102201	622 1707	1280 4164 ± 0	1284 1384 ± 2	997 1395 ± 2	981 1398 ± 2	920 1401 ± 2	832 1456 ± 2	74 299 ± 17	82 304 ± 16
272	cyberlink-010	1590818	102180	868 3678	1352 8260 ± 0	1218 1265 ± 2	953 1314 ± 5	915 1294 ± 2	831 1273 ± 2	729 1305 ± 2	136 476 ± 23	143 472 ± 14
273	cyberlink-011	1397496	102171	827 3029	1329 6212 ± 0	1167 1196 ± 3	867 1193 ± 2	837 1195 ± 3	782 1215 ± 6	678 1231 ± 5	907 3768 ± 75	906 3735 ± 57
274	cyberlink-012	1200318	102281	808 2789	1327 6212 ± 0	569 601 ± 1	395 621 ± 5	348 610 ± 2	309 614 ± 2	281 649 ± 5	724 2343 ± 26	730 2377 ± 34
275	cyberlink-013	893519	102285	680 1964	1325 6212 ± 0	573 603 ± 1	374 602 ± 2	344 606 ± 2	308 613 ± 2	276 642 ± 1	80 307 ± 7	84 306 ± 5
276	cyberlink-014	1190911	102304	815 2876	1350 8260 ± 0	739 720 ± 1	509 736 ± 5	474 735 ± 10	421 731 ± 3	365 762 ± 3	106 378 ± 8	112 377 ± 13
277	cyberlink-015	1190911	102309	814 2875	1351 8260 ± 0	752 730 ± 1	515 741 ± 6	473 735 ± 12	422 732 ± 2	384 778 ± 1	753 2497 ± 26	758 2493 ± 51
278	dahua-000	283642	171917	-	877 2048 ± 0	298 363 ± 7	-	-	-	-	105 373 ± 16	106 364 ± 17
279	dahua-001	283642	171917	-	721 2048 ± 0	299 363 ± 6	-	-	-	-	102 367 ± 10	105 354 ± 16
280	dahua-002	526452	171518	-	719 2048 ± 0	615 628 ± 7	-	-	-	-	128 461 ± 23	133 454 ± 20
281	dahua-003	605337	141332	-	857 2048 ± 0	483 535 ± 2	-	-	-	-	239 648 ± 20	236 631 ± 34
282	dahua-004	832455	141070	-	750 2048 ± 0	756 735 ± 3	-	-	-	-	290 730 ± 25	286 707 ± 44
283	dahua-005	1586899	169478	-	1221 4096 ± 0	1309 1418 ± 34	-	-	-	-	364 957 ± 23	373 969 ± 19
284	dahua-006	831641	119261	921 5068	648 2048 ± 0	1296 1398 ± 2	1000 1397 ± 1	988 1404 ± 1	921 1402 ± 1	794 1402 ± 1	55 249 ± 13	61 250 ± 11
285	dahua-007	1578737	119418	950 7237	1216 4096 ± 0	1292 1393 ± 2	983 1373 ± 1	970 1378 ± 1	902 1378 ± 1	779 1379 ± 2	103 367 ± 102	125 434 ± 108
286	daon-000	280726	2307	690 2010	1058 2065 ± 0	514 562 ± 3	359 581 ± 5	506 791 ± 9	500 838 ± 15	557 1055 ± 32	1170 16052 ± 88	1173 16041 ± 85
287	daon-001	296035	69405	196 587	777 2048 ± 0	689 682 ± 0	435 661 ± 0	427 688 ± 0	375 683 ± 0	283 657 ± 0	323 803 ± 23	333 815 ± 22
288	daon-002	295360	66546	264 731	690 2048 ± 0	781 765 ± 0	534 767 ± 1	498 768 ± 6	453 776 ± 1	377 770 ± 0	333 840 ± 17	344 858 ± 26
289	datech-000	617605	139575	929 5599	1198 4096 ± 0	528 573 ± 32	361 583 ± 44	335 593 ± 37	1082 14123 ± 9564	1071 15514 ± 2343	1070 7857 ± 29	1070 7852 ± 25
290	datech-001	835404	139615	949 7179	1168 4096 ± 0	1040 1017 ± 83	759 1057 ± 65	734 1062 ± 88	690 1109 ± 81	724 1299 ± 92	1072 7944 ± 31	1073 7981 ± 56
291	datech-002	854184	139615	953 7446	1193 4096 ± 0	1085 1086 ± 115	817 1130 ± 119	770 1113 ± 123	773 1204 ± 107	801 1413 ± 145	1071 7860 ± 20	1071 7857 ± 26
292	decatur-000	350495	171271	352 907	1240 4100 ± 0	1044 1024 ± 2	-	-	-	-	1118 11439 ± 80	1120 11418 ± 112
293	decatur-001	342866	253734	570 1508	943 2052 ± 0	1097 1103 ± 2	764 1064 ± 2	735 1063 ± 2	661 1067 ± 2	579 1084 ± 2	200 610 ± 19	207 602 ± 8
294	decloakface-001	29693	170719	111 368	572 2048 ± 0	125 196 ± 58	76 201 ± 52	73 229 ± 53	91 298 ± 60	203 532 ± 61	957 4638 ± 19	957 4646 ± 22
295	decloakface-002	1692	143986	76 260	540 2048 ± 0	66 127 ± 0	39 135 ± 0	38 157 ± 0	56 218 ± 0	151 458 ± 2	943 4380 ± 31	944 4383 ± 45
296	deepglint-001	569802	206788	-	1141 4096 ± 0	741 721 ± 4	-	-	-	-	898 3680 ± 35	891 3517 ± 182
297	deepglint-002	459642	272878	-	1162 4096 ± 0	678 677 ± 2	577 826 ± 74	553 848 ± 42	505 849 ± 55	454 886 ± 27	1144 13633 ± 87	1143 12905 ± 440
298	deepglint-003	838065	262081	-	1315 6144 ± 0	1137 1159 ± 1	830 1145 ± 1	801 1148 ± 1	728 1148 ± 1	641 1163 ± 1	1177 17227 ± 41	1179 17210 ± 51
299	deepglint-004	1073382	261571	833 3116	860 2048 ± 0	1334 1470 ± 1	1045 1474 ± 1	1033 1485 ± 1	969 1474 ± 1	854 1492 ± 2	1014 5961 ± 34	1013 5955 ± 29
300	deepglint-005	960326	213877	823 2991	667 2048 ± 0	1306 1408 ± 1	1024 1431 ± 2	1000 1424 ± 3	940 1424 ± 3	828 1446 ± 2	1040 6765 ± 38	1037 6765 ± 40
301	deepsea-001	147497	336250	106 358	246 1024 ± 0	617 630 ± 7	527 752 ± 37	480 746 ± 30	415 727 ± 32	404 820 ± 32	505 1401 ± 37	533 1467 ± 50
302	deepsense-000	357113	936618	-	811 2048 ± 0	661 664 ± 3	424 645 ± 1	401 660 ± 2	381 687 ± 2	400 808 ± 3	137 480 ± 22	139 459 ± 34
303	deepsense-001	73173	1288355	923 5314	117 512 ± 0	1124 1142 ± 2	844 1164 ± 3	827 1183 ± 3	770 1201 ± 3	743 1323 ± 2	726 2356 ± 35	726 2354 ± 42
304	deepsense-002	73173	1266131	922 5280	201 896 ± 0	1264 1350 ± 1	943 1299 ± 8	933 1324 ± 0	878 1348 ± 0	843 1474 ± 4	880 3505 ± 32	890 3515 ± 40
305	deepsense-003	73173	1359497	939 6555	203 901 ± 0	862 832 ± 2	670 940 ± 2	551 845 ± 4	596 983 ± 1	506 976 ± 7	612 1797 ± 25	617 1795 ± 19
306	deepsense-004	560774	1052093	952 7310	205 916 ± 0	1214 1259 ± 2	941 1294 ± 9	892 1268 ± 7	819 1261 ± 8	755 1334 ± 7	633 1884 ± 19	637 1884 ± 25
307	deepsense-005	560774	1052093	951 7309	204 916 ± 0	1315 1430 ± 1	921 1264 ± 1	873 1246 ± 1	813 1254 ± 1	763 1353 ± 4	644 1920 ± 26	650 1932 ± 40
308	deepsense-006	643809	1052098	954 7719	206 916 ± 0	1261 1348 ± 2	972 1347 ± 2	828 1184 ± 4	895 1369 ± 3	840 1473 ± 4	628 1860 ± 13	630 1853 ± 22

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE							COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
309	deepsense-007	643809	1070446	955 7769	208 920 ± 0	1141 1163 ± 1	850 1173 ± 3	831 1190 ± 2	777 1209 ± 3	732 1310 ± 4	625 1847 ± 11	632 1860 ± 28
310	deepsense-008	643809	1070340	956 7770	207 920 ± 0	1353 1571 ± 1	1059 1572 ± 0	1051 1610 ± 1	1011 1729 ± 1	956 2216 ± 1	948 4469 ± 109	948 4498 ± 68
311	dermalog-001	0	287736	-	266 1043 ± 0	49 106 ± 1	-	-	-	-	1210 22160 ± 166	1214 22131 ± 131
312	dermalog-002	0	287738	-	264 1043 ± 0	29 81 ± 0	-	-	-	-	1211 22169 ± 114	1213 22105 ± 146
313	dermalog-003	0	309430	-	265 1043 ± 0	59 121 ± 22	-	-	-	-	1216 22957 ± 93	1217 22808 ± 131
314	dermalog-004	0	245770	-	9 128 ± 0	80 149 ± 5	-	-	-	-	145 490 ± 26	142 471 ± 26
315	dermalog-005	0	317687	-	6 128 ± 0	68 130 ± 11	-	-	-	-	148 499 ± 22	152 500 ± 22
316	dermalog-006	0	452387	-	4 128 ± 0	481 532 ± 12	-	-	-	-	150 506 ± 23	138 459 ± 23
317	dermalog-007	0	503332	-	86 512 ± 0	161 239 ± 9	-	-	-	-	345 887 ± 23	277 690 ± 25
318	dermalog-008	0	937895	-	134 512 ± 0	347 404 ± 2	220 410 ± 3	196 424 ± 5	173 430 ± 5	161 477 ± 5	132 468 ± 31	94 328 ± 13
319	dermalog-009	0	319363	534 1369	132 512 ± 0	280 349 ± 0	169 351 ± 0	134 352 ± 0	122 357 ± 0	109 389 ± 0	142 487 ± 34	116 385 ± 29
320	dermalog-010	0	525908	873 3789	145 512 ± 0	626 635 ± 0	420 640 ± 1	387 639 ± 4	342 647 ± 3	310 691 ± 5	124 444 ± 13	101 341 ± 26
321	dermalog-011	0	278395	255 716	7 128 ± 0	276 343 ± 0	162 345 ± 0	131 347 ± 0	116 351 ± 0	94 363 ± 0	75 299 ± 19	64 253 ± 14
322	dermalog-012	0	293431	258 723	5 128 ± 0	108 181 ± 0	55 179 ± 0	46 182 ± 0	40 186 ± 0	48 242 ± 0	26 163 ± 10	40 196 ± 16
323	dermalog-013	0	293658	894 4263	11 128 ± 0	109 183 ± 2	59 180 ± 2	44 181 ± 1	38 183 ± 1	34 205 ± 1	32 186 ± 8	49 221 ± 7
324	dermalog-014	0	756422	479 1201	232 1024 ± 0	135 204 ± 0	73 197 ± 0	58 198 ± 1	47 199 ± 0	47 241 ± 0	115 424 ± 17	113 377 ± 17
325	dermalog-015	0	909348	756 2452	249 1024 ± 0	1361 1929 ± 1	1072 1891 ± 0	1064 1955 ± 1	1031 1899 ± 1	928 1904 ± 1	99 360 ± 25	70 267 ± 14
326	dicio-001	61751	119517	21 84	166 520 ± 0	490 538 ± 0	343 563 ± 10	597 915 ± 3	1020 1800 ± 7	1035 5286 ± 30	799 2818 ± 20	801 2807 ± 31
327	dicio-002	571566	85868	505 1290	1053 2060 ± 0	876 846 ± 1	532 761 ± 0	501 775 ± 1	461 784 ± 1	416 831 ± 0	1028 6242 ± 74	1026 6256 ± 80
328	didiglobalface-001	259849	70680	170 527	739 2048 ± 0	589 612 ± 1	416 633 ± 3	380 634 ± 3	345 650 ± 15	293 666 ± 4	368 973 ± 20	378 988 ± 20
329	didiglobalface-002	260054	161508	301 812	905 2048 ± 0	605 622 ± 1	417 633 ± 1	390 642 ± 2	354 659 ± 4	339 726 ± 15	167 560 ± 10	176 567 ± 13
330	didiglobalface-003	1001649	83986	498 1274	713 2048 ± 0	760 740 ± 2	512 740 ± 2	496 767 ± 5	456 779 ± 4	434 853 ± 17	555 1544 ± 13	558 1539 ± 17
331	digidata-000	133370	30249	75 259	550 2048 ± 0	296 361 ± 0	174 360 ± 0	144 361 ± 0	125 363 ± 0	102 380 ± 0	673 2084 ± 37	666 2039 ± 42
332	digidata-001	254564	33036	109 367	432 2048 ± 0	510 559 ± 1	341 561 ± 1	309 562 ± 1	273 564 ± 1	247 602 ± 1	1106 10308 ± 102	1107 10301 ± 121
333	digitalbarriers-000	157794	427472	-	1021 2056 ± 0	48 104 ± 0	-	-	-	-	1141 13232 ± 166	1145 13226 ± 146
334	digitalbarriers-001	236915	427537	-	1015 2056 ± 0	216 294 ± 1	-	-	-	-	1135 12311 ± 164	1137 12347 ± 197
335	digitalbarriers-002	83002	598577	676 1930	1044 2056 ± 0	138 209 ± 11	102 250 ± 19	184 411 ± 37	474 808 ± 72	957 2236 ± 123	1142 13409 ± 228	1146 13267 ± 206
336	dps-000	0	2211812	542 1405	1137 4096 ± 0	891 868 ± 2	632 893 ± 6	1012 1445 ± 9	1064 2910 ± 38	1057 9345 ± 17	528 1473 ± 37	537 1479 ± 37
337	dsk-000	11967	782905	74 252	136 512 ± 0	230 304 ± 47	145 317 ± 33	681 1001 ± 96	1061 2660 ± 170	1065 10451 ± 832	1055 7152 ± 115	1050 7134 ± 111
338	einetworks-000	372608	219883	342 880	993 2056 ± 0	634 645 ± 3	-	-	-	-	969 4876 ± 66	981 5156 ± 77
339	einetworksindia-000	372375	479472	517 1322	1038 2056 ± 0	316 378 ± 1	196 382 ± 1	165 383 ± 1	153 397 ± 0	150 456 ± 3	1163 15171 ± 41	1164 15138 ± 62
340	einetworksindia-001	562398	481792	652 1808	1000 2056 ± 0	432 479 ± 0	279 481 ± 1	251 485 ± 1	225 494 ± 1	211 541 ± 1	1161 15147 ± 63	1163 15134 ± 74
341	einetworksindia-002	1214466	143768	759 2462	767 2048 ± 0	1087 1087 ± 1	772 1082 ± 1	737 1065 ± 0	682 1098 ± 3	629 1150 ± 2	1145 13785 ± 34	1148 13767 ± 56
342	ekin-002	51434	278	40 139	1107 3072 ± 0	1161 1186 ± 13	856 1180 ± 12	824 1181 ± 11	765 1191 ± 11	665 1207 ± 8	940 4294 ± 80	1000 5569 ± 112
343	element-000	721679	24895	501 1287	875 2048 ± 0	340 399 ± 1	223 417 ± 1	199 428 ± 9	214 478 ± 14	305 688 ± 45	176 583 ± 10	185 585 ± 13
344	enface-000	369598	153781	236 671	222 1024 ± 0	506 555 ± 4	339 558 ± 4	413 669 ± 6	600 987 ± 15	968 2349 ± 54	1051 7059 ± 62	1046 6980 ± 65
345	enface-001	370710	173609	235 669	233 1024 ± 0	503 550 ± 4	336 555 ± 3	412 668 ± 7	594 981 ± 15	976 2416 ± 59	1039 6734 ± 68	1038 6766 ± 69
346	enface-002	858356	98741	961 9004	219 1024 ± 0	1048 1026 ± 1	754 1038 ± 3	726 1057 ± 7	701 1123 ± 4	756 1338 ± 8	551 1529 ± 23	554 1530 ± 35
347	enqura-001	0	6136892	491 1263	730 2048 ± 0	149 221 ± 5	88 220 ± 3	78 239 ± 3	72 262 ± 3	60 288 ± 3	1 0 ± 0	1 0 ± 0
348	eocortex-000	255937	59432	70 224	444 2048 ± 0	233 305 ± 22	159 341 ± 25	211 440 ± 47	203 464 ± 45	190 513 ± 44	356 923 ± 11	364 918 ± 11
349	ercacat-001	811623	58012	810 2816	957 2052 ± 0	1065 1052 ± 3	-	-	-	-	761 2551 ± 62	759 2501 ± 81
350	euronovate-001	0	1774966	520 1346	276 1177 ± 0	1057 1034 ± 2	845 1165 ± 3	809 1160 ± 3	750 1177 ± 3	645 1172 ± 2	1342 81294 ± 591	1340 81631 ± 931
351	euronovate-002	0	5476674	307 818	1294 4249 ± 0	214 293 ± 0	134 296 ± 0	101 298 ± 0	93 309 ± 0	78 339 ± 0	1257 32673 ± 391	1258 32587 ± 391
352	euronovate-003	0	5637394	475 1193	1085 2201 ± 0	225 300 ± 0	136 300 ± 0	103 303 ± 0	93 310 ± 0	80 340 ± 0	1272 37908 ± 968	1276 38285 ± 938

Notes	
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Table 28: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
353	euronovate-004	0	1335993	407 1049	1086 2201 ± 0	210 290 ± 0	131 294 ± 0	98 294 ± 0	87 295 ± 0	61 294 ± 0	1286 46290 ± 490	1286 46199 ± 484
354	everai-000	229700	144802	-	554 2048 ± 0	403 455 ± 1	-	-	-	-	109 385 ± 10	115 382 ± 13
355	everai-001	449149	144802	-	723 2048 ± 0	721 701 ± 1	-	-	-	-	111 395 ± 11	121 404 ± 23
356	everai-002	561727	281965	-	1170 4096 ± 0	777 758 ± 0	-	-	-	-	235 644 ± 14	230 624 ± 35
357	everai-paravision-003	539802	118876	-	1224 4096 ± 0	673 674 ± 4	-	-	-	-	267 699 ± 20	293 713 ± 47
358	expasoft-000	15341	240451	-	530 2048 ± 0	21 68 ± 0	14 71 ± 0	9 75 ± 0	9 71 ± 0	7 72 ± 1	608 1779 ± 26	605 1757 ± 97
359	expasoft-001	39057	983064	43 142	403 2048 ± 0	22 70 ± 0	15 74 ± 0	11 77 ± 0	10 73 ± 0	9 74 ± 0	576 1660 ± 35	580 1676 ± 48
360	expasoft-002	38760	59825	57 170	675 2048 ± 0	8 34 ± 0	5 34 ± 0	5 34 ± 0	4 34 ± 0	2 34 ± 0	1085 8870 ± 78	1086 8838 ± 77
361	f8-001	272977	19668	499 1276	586 2048 ± 0	849 822 ± 39	-	-	-	-	1166 15262 ± 139	1169 15277 ± 212
362	f8-002	28278	215616	20 84	475 2048 ± 0	11 39 ± 0	7 41 ± 0	10 75 ± 0	46 197 ± 1	318 702 ± 1	1155 14765 ± 131	1158 14790 ± 133
363	facehawk-000	120009	7737	36 129	196 776 ± 1	342 399 ± 0	215 402 ± 0	187 414 ± 1	148 391 ± 2	138 440 ± 3	1113 10931 ± 155	1114 10915 ± 149
364	facelocate-001	4739	11106	753 2449	19 168 ± 0	7 34 ± 1	6 38 ± 0	13 84 ± 1	20 112 ± 4	35 206 ± 13	1092 9565 ± 91	1096 9629 ± 131
365	faceonlive-001	0	71529	90 300	1010 2056 ± 0	104 179 ± 0	56 179 ± 0	55 190 ± 0	55 217 ± 0	82 343 ± 1	401 1064 ± 37	396 1033 ± 35
366	faceonlive-002	155220	141019	383 997	716 2048 ± 0	798 783 ± 1	557 797 ± 2	509 794 ± 2	476 809 ± 3	465 901 ± 2	1146 13798 ± 197	1147 13743 ± 127
367	faceonlive-003	518321	560984	908 4691	243 1024 ± 0	1056 1032 ± 4	781 1091 ± 3	1062 1942 ± 6	1009 1723 ± 5	1023 4168 ± 3	1171 16149 ± 41	1174 16135 ± 54
368	facephi-000	148904	5219	969 20248	456 2048 ± 0	896 871 ± 2	622 881 ± 3	576 880 ± 4	534 888 ± 4	489 949 ± 12	931 4067 ± 53	934 4047 ± 53
369	facephi-001	138133	282874	521 1347	105 512 ± 0	207 285 ± 0	114 272 ± 2	97 291 ± 5	89 296 ± 3	169 489 ± 5	847 3194 ± 41	853 3184 ± 54
370	facephi-002	1031362	112529	936 6074	631 2048 ± 0	1201 1240 ± 5	909 1251 ± 5	882 1253 ± 21	844 1298 ± 5	909 1713 ± 19	1129 11961 ± 81	1132 11970 ± 83
371	facesoft-000	370120	10612	294 796	596 2048 ± 0	674 675 ± 18	441 669 ± 3	424 686 ± 3	368 675 ± 5	304 687 ± 2	701 2239 ± 28	709 2277 ± 96
372	facetag-000	1232331	4022	372 965	192 684 ± 0	286 355 ± 17	184 369 ± 8	665 989 ± 33	1056 2408 ± 91	1052 7930 ± 316	1331 72003 ± 625	1331 71912 ± 612
373	facetag-001	1258247	4022	-	1251 4100 ± 0	1020 991 ± 3	722 995 ± 3	693 1018 ± 3	663 1069 ± 5	712 1284 ± 8	860 3323 ± 28	866 3287 ± 34
374	facetag-002	819806	4021	250 706	451 2048 ± 0	497 544 ± 1	328 544 ± 0	298 542 ± 0	260 545 ± 0	220 554 ± 0	594 1730 ± 25	600 1733 ± 25
375	facex-001	305074	930372	845 3336	768 2048 ± 0	368 422 ± 4	239 434 ± 4	282 520 ± 7	427 737 ± 13	903 1670 ± 27	630 1871 ± 23	628 1846 ± 29
376	facex-002	305074	928334	826 3011	765 2048 ± 0	372 426 ± 5	232 429 ± 4	276 516 ± 8	419 730 ± 12	912 1738 ± 36	223 631 ± 25	224 614 ± 19
377	facia-001	296496	745403	348 889	390 2048 ± 0	1095 1099 ± 1	799 1109 ± 0	771 1113 ± 0	705 1125 ± 3	688 1250 ± 1	1318 62245 ± 397	1315 62249 ± 496
378	facia-002	585227	694738	671 1907	942 2052 ± 0	1259 1347 ± 4	971 1337 ± 3	1041 1509 ± 7	1032 1919 ± 11	1017 3982 ± 34	1207 21963 ± 400	1210 21869 ± 318
379	faicetech-000	247687	34022	523 1349	441 2048 ± 0	1155 1179 ± 1	872 1199 ± 1	833 1193 ± 1	772 1202 ± 0	682 1240 ± 4	182 594 ± 4	196 593 ± 1
380	farfaces-001	346494	44581	77 262	139 512 ± 0	1154 1179 ± 1	857 1180 ± 1	822 1180 ± 0	760 1185 ± 1	668 1209 ± 2	337 855 ± 25	345 860 ± 31
381	fastenterprises-000	273365	235899	396 1030	504 2048 ± 0	655 662 ± 1	443 671 ± 0	409 664 ± 0	367 673 ± 3	306 688 ± 5	910 3806 ± 96	1257 32064 ± 185
382	fci-000	1486985	454513	834 3123	902 2048 ± 0	1332 1464 ± 12	1050 1494 ± 9	1021 1457 ± 10	964 1462 ± 11	869 1525 ± 5	718 2309 ± 8	720 2314 ± 14
383	fdu-000	202296	1307	-	171 534 ± 0	31 84 ± 0	-	-	-	-	587 1713 ± 28	591 1715 ± 20
384	fdu-001	345583	1329	-	310 1808 ± 0	69 131 ± 0	-	-	-	-	478 1288 ± 26	483 1281 ± 22
385	fedu-001	466605	496375	586 1557	618 2048 ± 0	559 592 ± 1	398 623 ± 1	363 624 ± 0	321 623 ± 0	277 647 ± 0	727 2362 ± 13	727 2361 ± 22
386	fiberhome-nanjing-002	207398	596827	-	221 1024 ± 0	1182 1217 ± 2	940 1294 ± 30	925 1312 ± 12	971 1477 ± 14	747 1326 ± 11	560 1582 ± 57	560 1560 ± 51
387	fiberhome-nanjing-003	352895	1482309	334 859	634 2048 ± 0	1119 1136 ± 7	818 1134 ± 4	788 1132 ± 3	721 1139 ± 3	632 1154 ± 5	416 1097 ± 38	420 1083 ± 42
388	fiberhome-nanjing-004	443779	1482313	422 1077	1215 4096 ± 0	1252 1321 ± 5	948 1304 ± 3	922 1307 ± 2	853 1308 ± 3	746 1326 ± 5	473 1276 ± 40	478 1265 ± 38
389	fincore-000	256615	19409	175 536	650 2048 ± 0	460 508 ± 3	300 505 ± 0	271 508 ± 1	236 513 ± 2	205 535 ± 1	602 1765 ± 31	607 1763 ± 22
390	firstcreditkz-001	553811	24803	441 1113	696 2048 ± 0	827 808 ± 0	723 997 ± 0	733 1061 ± 1	748 1174 ± 1	917 1774 ± 54	349 904 ± 20	356 903 ± 23
391	firstcreditkz-002	977538	24879	678 1951	420 2048 ± 0	1217 1265 ± 1	928 1275 ± 4	920 1299 ± 7	874 1341 ± 17	863 1515 ± 40	303 761 ± 28	315 774 ± 32
392	firstcreditkz-003	1145884	24907	711 2144	462 2048 ± 0	1163 1188 ± 79	1049 1492 ± 77	1076 2566 ± 293	1076 4939 ± 888	1070 14753 ± 3518	210 616 ± 10	222 613 ± 16
393	firstcreditkz-004	1205746	38973	777 2587	821 2048 ± 0	1073 1060 ± 5	899 1236 ± 4	947 1343 ± 6	1013 1752 ± 15	1016 3765 ± 42	157 525 ± 16	157 521 ± 14
394	foomobi-001	0	219961	64 189	885 2048 ± 0	289 357 ± 0	201 388 ± 2	791 1138 ± 1	1067 2974 ± 10	1062 10101 ± 10	1292 47409 ± 453	1292 47413 ± 421
395	foomobi-002	0	219961	63 189	322 2048 ± 0	223 299 ± 0	147 323 ± 0	635 957 ± 1	1058 2496 ± 2	1053 8549 ± 7	1247 30257 ± 724	1246 30010 ± 320
396	fourthlinecom-001	0	437655	742 2410	887 2048 ± 0	1273 1372 ± 5	916 1257 ± 4	904 1283 ± 2	803 1243 ± 3	684 1244 ± 4	734 2391 ± 17	735 2403 ± 26

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
397	fpt-000	19013	170633	69 219	835 2048 ± 0	57 118 ± 0	34 122 ± 1	27 122 ± 0	22 120 ± 0	27 178 ± 2	914 3871 ± 31	916 3883 ± 29
398	fpt-001	256529	142347	200 600	913 2048 ± 0	571 602 ± 0	379 606 ± 0	361 623 ± 1	319 621 ± 0	270 637 ± 0	919 3934 ± 10	922 3931 ± 14
399	fraudcom-000	354020	561861	373 966	950 2052 ± 0	512 561 ± 2	322 539 ± 2	295 541 ± 1	268 557 ± 5	238 594 ± 6	705 2258 ± 10	706 2256 ± 29
400	frpkauai-001	507771	24807	890 4143	507 2048 ± 0	702 689 ± 1	470 691 ± 0	436 697 ± 2	408 714 ± 6	382 775 ± 31	298 752 ± 29	312 764 ± 23
401	frpkauai-002	519141	24803	442 1113	788 2048 ± 0	821 799 ± 0	714 987 ± 0	719 1046 ± 1	736 1163 ± 2	916 1769 ± 4	351 907 ± 20	352 886 ± 28
402	frpkauai-003	1135621	24939	716 2184	363 2048 ± 0	976 948 ± 3	800 1110 ± 2	857 1225 ± 5	896 1369 ± 16	935 2007 ± 34	156 524 ± 14	161 529 ± 19
403	frpkauai-004	513748	3521	487 1248	67 296 ± 0	248 317 ± 1	142 316 ± 3	114 317 ± 1	103 322 ± 1	95 370 ± 9	1066 7700 ± 81	1065 7659 ± 78
404	fujitsulab-000	0	205894	-	108 512 ± 0	365 419 ± 1	-	-	-	-	893 3613 ± 37	897 3621 ± 29
405	fujitsulab-001	0	548917	-	1258 4104 ± 0	1240 1300 ± 5	937 1291 ± 2	918 1295 ± 2	847 1304 ± 2	782 1382 ± 2	806 2853 ± 16	807 2847 ± 14
406	fujitsulab-002	0	1088887	618 1685	1260 4104 ± 0	1198 1237 ± 2	889 1222 ± 2	865 1236 ± 1	809 1251 ± 2	750 1327 ± 2	801 2836 ± 25	802 2809 ± 44
407	fujitsulab-003	662263	318209	942 6691	1262 4104 ± 0	983 951 ± 20	671 941 ± 19	630 952 ± 19	590 971 ± 20	550 1045 ± 21	807 2855 ± 16	809 2849 ± 19
408	g42-intellibrain-001	1031335	235521	972 25154	61 269 ± 0	1007 976 ± 6	699 975 ± 1	677 997 ± 2	662 1068 ± 3	769 1362 ± 8	1011 5878 ± 96	1011 5865 ± 71
409	g42-intellibrain-002	1043920	132389	968 19747	62 269 ± 0	941 915 ± 2	650 920 ± 2	625 946 ± 2	611 998 ± 4	673 1224 ± 8	1153 14703 ± 56	1157 14658 ± 97
410	geo-000	114483	304983	-	524 2048 ± 0	879 851 ± 1	-	-	-	-	1351 137544 ± 6225	1351 137925 ± 6548
411	geo-001	258516	70163	-	605 2048 ± 0	1083 1079 ± 0	769 1076 ± 0	742 1076 ± 0	670 1078 ± 0	592 1102 ± 0	845 3163 ± 47	849 3158 ± 38
412	geo-002	369903	98667	393 1021	720 2048 ± 0	808 791 ± 1	553 793 ± 0	510 794 ± 0	467 795 ± 1	397 803 ± 1	870 3407 ± 45	879 3422 ± 65
413	geo-003	371712	102175	-	840 2048 ± 0	1227 1283 ± 1	936 1290 ± 1	906 1285 ± 1	842 1292 ± 1	726 1302 ± 1	375 997 ± 13	386 1001 ± 20
414	geo-004	168980	107714	502 1287	396 2048 ± 0	1219 1268 ± 1	929 1279 ± 1	899 1274 ± 0	817 1259 ± 1	721 1296 ± 1	384 1023 ± 20	394 1028 ± 22
415	gistouch-000	155338	444582	179 541	792 2048 ± 0	255 325 ± 1	151 326 ± 1	126 337 ± 1	119 354 ± 1	172 495 ± 1	1088 9505 ± 604	1087 9443 ± 388
416	gistouch-001	426635	444545	612 1651	659 2048 ± 0	956 930 ± 3	649 919 ± 3	617 937 ± 4	588 966 ± 2	600 1113 ± 1	1078 8475 ± 133	1080 8460 ± 173
417	glory-000	0	98176	-	78 418 ± 0	90 165 ± 2	-	-	-	-	1049 7003 ± 84	1045 6978 ± 71
418	glory-001	0	144786	-	309 1726 ± 0	336 393 ± 2	-	-	-	-	1096 9607 ± 128	1091 9539 ± 182
419	glory-002	0	385177	-	1074 2106 ± 0	563 594 ± 3	514 740 ± 3	627 948 ± 3	1045 2168 ± 6	29 191 ± 15	1041 6787 ± 85	1031 6551 ± 249
420	glory-003	0	536910	-	1291 4234 ± 0	442 489 ± 0	346 565 ± 0	470 732 ± 0	1026 1876 ± 2	1054 8941 ± 20	1016 6020 ± 90	1016 6003 ± 72
421	glory-004	0	999639	721 2200	1287 4182 ± 0	698 688 ± 0	530 759 ± 1	621 941 ± 1	1043 2134 ± 4	1058 9360 ± 47	974 4982 ± 66	976 4990 ± 63
422	glory-005	0	999999	754 2450	1285 4182 ± 0	723 703 ± 1	550 789 ± 0	648 972 ± 1	1047 2200 ± 25	1060 9679 ± 22	984 5224 ± 93	983 5176 ± 81
423	glory-006	0	1004784	750 2438	1286 4182 ± 0	724 704 ± 1	540 774 ± 0	646 968 ± 2	1053 2286 ± 18	1064 10381 ± 151	1009 5853 ± 77	1010 5819 ± 74
424	glory-007	0	1004846	751 2442	1284 4182 ± 0	327 385 ± 0	234 431 ± 0	320 575 ± 14	966 1464 ± 24	1047 6782 ± 62	882 3506 ± 51	887 3489 ± 66
425	gorilla-000	98290	1122916	-	1289 4204 ± 0	176 256 ± 14	-	-	-	-	916 3875 ± 29	915 3872 ± 51
426	gorilla-001	93768	1101838	-	1081 2156 ± 0	87 160 ± 14	-	-	-	-	873 3429 ± 145	867 3288 ± 51
427	gorilla-002	93869	1281839	-	275 1132 ± 0	251 322 ± 14	-	-	-	-	783 2715 ± 68	770 2585 ± 84
428	gorilla-003	94409	1281823	-	274 1132 ± 0	268 334 ± 25	-	-	-	-	803 2840 ± 42	812 2865 ± 87
429	gorilla-004	186952	1274131	-	1083 2192 ± 0	331 389 ± 3	-	-	-	-	792 2768 ± 44	790 2745 ± 44
430	gorilla-005	100684	1297614	-	1084 2192 ± 0	352 407 ± 3	244 437 ± 2	216 448 ± 4	210 473 ± 4	234 589 ± 15	776 2678 ± 42	794 2770 ± 112
431	gorilla-006	172743	1318812	-	1292 4240 ± 0	402 454 ± 3	283 484 ± 3	262 497 ± 5	256 543 ± 25	478 928 ± 60	906 3755 ± 38	908 3737 ± 44
432	gorilla-007	441058	708166	617 1683	1331 6288 ± 0	560 592 ± 1	369 592 ± 1	342 603 ± 1	324 625 ± 2	335 722 ± 9	900 3686 ± 37	904 3709 ± 36
433	gorilla-008	450175	707000	654 1812	1353 8338 ± 0	566 595 ± 1	368 590 ± 0	339 600 ± 1	320 621 ± 2	332 720 ± 9	953 4530 ± 44	951 4524 ± 38
434	gorilla-009	329584	297395	514 1304	1293 4242 ± 0	922 899 ± 2	654 922 ± 1	587 901 ± 3	553 924 ± 4	543 1032 ± 12	714 2294 ± 74	715 2301 ± 66
435	gpstechvn-000	108365	345975	780 2646	658 2048 ± 0	221 296 ± 1	135 297 ± 1	105 304 ± 0	98 316 ± 0	103 382 ± 0	741 2442 ± 11	743 2440 ± 16
436	graymatics-001	13095	70406	34 128	1202 4096 ± 0	120 191 ± 1	77 203 ± 1	333 592 ± 5	1006 1698 ± 9	1049 7150 ± 34	1277 39874 ± 309	1279 39762 ± 295
437	griaule-000	0	598214	410 1055	954 2052 ± 0	361 416 ± 6	229 425 ± 7	500 770 ± 14	1012 1749 ± 43	1045 6406 ± 189	924 3987 ± 42	925 3938 ± 38
438	griaule-001	0	412061	495 1271	946 2052 ± 0	1142 1164 ± 1	790 1096 ± 5	760 1099 ± 4	717 1136 ± 2	860 1509 ± 2	921 3948 ± 23	928 3957 ± 32
439	griaule-002	0	1320474	665 1870	976 2052 ± 0	850 822 ± 1	656 924 ± 4	591 907 ± 1	644 1038 ± 21	814 1430 ± 9	925 4005 ± 32	931 4012 ± 31
440	gtelots-000	252631	59244	182 552	142 512 ± 0	802 785 ± 1	555 794 ± 0	518 810 ± 0	486 823 ± 2	449 875 ± 0	1208 22029 ± 130	1212 21988 ± 93

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	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
441	hertasecurity-000	0	780014	-	[26]256 ± 0	[43]99 ± 0	[24]98 ± 0	[21]100 ± 0	[18]107 ± 0	[19]139 ± 0	[278]710 ± 31	[263]667 ± 28
442	hertasecurity-001	0	944427	[470]1188	[99]512 ± 0	[278]346 ± 0	[163]345 ± 0	[132]349 ± 0	[118]354 ± 0	[108]388 ± 0	[604]1770 ± 45	[597]1726 ± 48
443	hertasecurity-002	0	944582	[466]1182	[138]512 ± 0	[438]484 ± 7	[275]478 ± 3	[245]480 ± 3	[226]495 ± 3	[197]520 ± 3	[713]2289 ± 40	[708]2267 ± 48
444	hertasecurity-003	0	944583	[465]1181	[133]512 ± 0	[447]495 ± 7	[278]480 ± 3	[252]486 ± 3	[222]491 ± 3	[198]520 ± 4	[1064]7619 ± 65	[1064]7597 ± 94
445	hik-001	667866	9290	[940]6597	[286]1408 ± 0	[641]651 ± 0	[440]667 ± 8	[418]677 ± 16	[379]686 ± 13	[346]737 ± 12	[143]488 ± 19	[145]477 ± 22
446	hisign-001	732412	167488	[589]1560	[1067]2080 ± 0	[1243]1306 ± 1	[958]1320 ± 1	[928]1315 ± 1	[858]1312 ± 1	[745]1325 ± 1	[41]201 ± 10	[36]185 ± 13
447	hisign-002	1014906	102652	[707]2131	[1065]2080 ± 0	[815]797 ± 0	[559]800 ± 5	[513]800 ± 0	[470]801 ± 0	[396]803 ± 1	[52]232 ± 11	[43]207 ± 11
448	hisign-003	2232829	156367	[599]1599	[1066]2080 ± 0	[1061]1040 ± 5	[773]1083 ± 4	[746]1085 ± 4	[677]1088 ± 4	[589]1093 ± 4	[27]167 ± 8	[25]150 ± 10
449	hyperverge-001	260819	88624	-	[764]2048 ± 0	[688]682 ± 20	[472]695 ± 17	[839]1196 ± 37	[1055]2400 ± 68	[1050]7178 ± 204	[1018]6026 ± 40	[1015]5984 ± 38
450	hyperverge-002	2951900	198832	[684]1975	[226]1024 ± 0	[960]938 ± 1	[669]939 ± 1	[620]941 ± 1	[570]945 ± 1	[505]975 ± 1	[1017]6023 ± 37	[1014]5966 ± 40
451	hyperverge-003	1167779	282156	[786]2687	[213]1024 ± 0	[1340]1477 ± 2	[1051]1503 ± 3	[1043]1520 ± 3	[987]1525 ± 4	[884]1565 ± 3	[169]566 ± 11	[173]561 ± 8
452	hyperverge-004	4924393	282156	[879]3908	[886]2048 ± 0	[1335]1471 ± 2	[1026]1434 ± 1	[1013]1446 ± 6	[952]1445 ± 3	[853]1491 ± 3	[374]996 ± 10	[384]1000 ± 19
453	hyperverge-005	3413303	284050	[785]2686	[251]1024 ± 0	[701]689 ± 0	[468]690 ± 0	[431]693 ± 0	[395]702 ± 6	[357]752 ± 5	[129]465 ± 2	[141]464 ± 10
454	hyperverge-006	3901500	284050	[696]2070	[211]1024 ± 0	[786]768 ± 1	[538]770 ± 2	[495]766 ± 1	[451]773 ± 1	[411]828 ± 6	[130]466 ± 2	[140]463 ± 4
455	hyundai-roboticslab-000	181134	191546	[454]1149	[900]2048 ± 0	[312]376 ± 3	[183]368 ± 1	[149]367 ± 2	[135]374 ± 0	[120]408 ± 1	[798]2815 ± 47	[800]2790 ± 50
456	hyundai-roboticslab-001	361330	106869	[310]820	[825]2048 ± 0	[291]358 ± 1	[177]361 ± 1	[145]362 ± 2	[134]374 ± 3	[113]394 ± 0	[839]3115 ± 34	[843]3117 ± 45
457	hyundai-roboticslab-002	181140	106752	[306]817	[715]2048 ± 0	[279]347 ± 0	[172]355 ± 0	[140]357 ± 0	[124]362 ± 3	[107]387 ± 0	[854]3243 ± 111	[862]3245 ± 114
458	hyundai-roboticslab-003	484277	106656	[691]2027	[883]2048 ± 0	[1357]1800 ± 0	[1067]1792 ± 0	[1058]1802 ± 0	[1028]1889 ± 0	[920]1810 ± 0	[1084]8841 ± 42	[1085]8819 ± 54
459	hzailu-001	0	372018	-	[1033]2056 ± 0	[1114]1126 ± 1	[814]1128 ± 1	[786]1130 ± 1	[713]1132 ± 1	[636]1159 ± 1	[347]894 ± 19	[354]899 ± 22
460	hzailu-002	1515880	74047	[910]4722	[987]2056 ± 0	[1132]1150 ± 5	[813]1127 ± 6	[785]1129 ± 7	[719]1137 ± 7	[646]1172 ± 3	[409]1079 ± 53	[412]1070 ± 31
461	hzailu-003	1923030	222185	[916]4858	[1114]3080 ± 0	[1289]1389 ± 5	[966]1331 ± 7	[941]1334 ± 2	[879]1349 ± 6	[810]1424 ± 8	[534]1483 ± 35	[532]1464 ± 31
462	hzailu-004	1938475	275639	[885]4023	[1112]3080 ± 0	[1349]1495 ± 8	[1048]1490 ± 6	[1035]1493 ± 8	[980]1502 ± 8	[886]1583 ± 17	[491]1361 ± 32	[514]1419 ± 44
463	hzailu-005	1573726	275643	[841]3292	[1308]5128 ± 0	[695]684 ± 10	[450]673 ± 7	[359]622 ± 1	[374]682 ± 6	[327]715 ± 2	[627]1853 ± 51	[624]1829 ± 34
464	hzailu-006	2996729	275643	[935]6070	[1340]7176 ± 0	[1350]1498 ± 11	[1047]1483 ± 15	[1008]1439 ± 8	[951]1441 ± 10	[882]1564 ± 40	[737]2434 ± 19	[747]2452 ± 32
465	hzailu-007	2906424	275643	[931]5897	[1339]7176 ± 0	[1314]1430 ± 19	[1032]1448 ± 10	[936]1328 ± 3	[981]1504 ± 17	[817]1434 ± 4	[750]2481 ± 28	[755]2488 ± 34
466	hzailu-008	2906977	275643	[932]5898	[1338]7176 ± 0	[1326]1452 ± 13	[1055]1557 ± 10	[1045]1545 ± 12	[992]1561 ± 20	[872]1533 ± 16	[752]2492 ± 62	[756]2489 ± 66
467	i2v-001	276820	26600	[304]815	[612]2048 ± 0	[740]721 ± 0	[505]729 ± 0	[467]731 ± 0	[420]731 ± 0	[369]764 ± 0	[1120]11523 ± 176	[1122]11533 ± 142
468	i2v-002	339732	122488	[626]1721	[728]2048 ± 0	[1320]1438 ± 1	[1046]1476 ± 1	[1009]1442 ± 1	[974]1480 ± 9	[873]1533 ± 1	[245]656 ± 35	[213]604 ± 28
469	icm-002	621586	903	-	[455]2048 ± 0	[1055]1031 ± 7	-	-	-	-	[1223]24052 ± 118	[1224]24049 ± 124
470	icm-003	1513988	940	[167]516	[501]2048 ± 0	[686]681 ± 6	[446]672 ± 4	[453]714 ± 11	[497]837 ± 41	[781]1381 ± 131	[1225]24351 ± 161	[1225]24227 ± 146
471	icm-004	2012129	1089	[409]1052	[669]2048 ± 0	[367]419 ± 6	[218]407 ± 6	[223]454 ± 15	[301]603 ± 51	[870]1527 ± 235	[1154]14730 ± 154	[1156]14521 ± 152
472	icm-005	877530	1097	[443]1116	[538]2048 ± 0	[113]185 ± 3	[61]181 ± 3	[62]208 ± 9	[102]321 ± 36	[535]1014 ± 185	[1104]10245 ± 65	[1106]10245 ± 69
473	icomm-000	807818	139431	[944]6728	[1190]4096 ± 0	[576]605 ± 26	[381]610 ± 30	[343]605 ± 27	[304]610 ± 23	[275]641 ± 32	[1079]8507 ± 25	[1081]8516 ± 26
474	icthtc-000	172459	1471004	[459]1165	[385]2048 ± 0	[273]338 ± 11	[158]338 ± 9	[207]437 ± 16	[399]705 ± 24	[910]1719 ± 44	[987]5284 ± 63	[988]5290 ± 54
475	id3-001	225574	34433	-	[163]520 ± 0	[159]238 ± 19	-	-	-	-	[396]1058 ± 32	[405]1049 ± 28
476	id3-002	225574	34433	-	[165]520 ± 0	[435]482 ± 34	-	-	-	-	[418]1100 ± 59	[404]1048 ± 32
477	id3-003	265951	49731	-	[59]264 ± 0	[244]316 ± 19	-	-	-	-	[486]1330 ± 25	[499]1354 ± 28
478	id3-004	171526	49725	-	[56]264 ± 0	[494]541 ± 11	-	-	-	-	[430]1135 ± 23	[452]1156 ± 32
479	id3-005	153439	22125	-	[58]264 ± 0	[429]479 ± 1	-	-	-	-	[1020]6072 ± 35	[1019]6077 ± 38
480	id3-006	210116	7706	[379]984	[162]520 ± 0	[692]683 ± 0	[778]1088 ± 1	[832]1192 ± 1	[778]1209 ± 1	[703]1270 ± 1	[997]5547 ± 34	[999]5563 ± 34
481	id3-007	185030	7728	-	[57]264 ± 0	[1039]1016 ± 1	[826]1139 ± 1	[1080]3911 ± 2	[1080]10752 ± 12	[1076]135182 ± 1912	[993]5500 ± 29	[992]5486 ± 35
482	id3-008	242416	8151	[412]1059	[55]264 ± 0	[844]819 ± 0	[880]1209 ± 2	[919]1297 ± 2	[870]1329 ± 1	[816]1433 ± 1	[1003]5658 ± 44	[1004]5624 ± 40
483	idemia-003	427244	106432	-	[72]352 ± 0	[306]368 ± 6	-	-	-	-	[1036]6654 ± 75	[969]4835 ± 90
484	idemia-004	406924	106436	-	[74]352 ± 0	[234]306 ± 5	-	-	-	-	[1000]5592 ± 518	[995]5533 ± 426

Notes	
1	The configuration size does not capture static data included in libraries.
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3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 31: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
485	idemia-005	509824	116761	-	188 588 ± 0	465 514 ± 15	-	-	-	-	1037 6657 ± 54	1034 6616 ± 53
486	idemia-006	570566	115633	-	191 668 ± 0	684 679 ± 4	659 926 ± 54	466 728 ± 7	440 760 ± 29	413 830 ± 31	983 5223 ± 80	984 5193 ± 72
487	idemia-007	353242	67485	-	82 468 ± 0	324 384 ± 0	202 389 ± 0	170 393 ± 1	161 405 ± 2	139 441 ± 8	853 3243 ± 63	854 3202 ± 63
488	idemia-008	374017	69922	474 1192	70 348 ± 0	405 457 ± 1	266 461 ± 0	234 466 ± 1	213 476 ± 2	189 513 ± 10	836 3080 ± 41	838 3046 ± 56
489	idemia-009	1066728	70572	790 2700	190 636 ± 0	1175 1207 ± 1	885 1218 ± 1	854 1222 ± 2	787 1222 ± 3	708 1280 ± 10	1004 5664 ± 84	1002 5597 ± 90
490	idemia-010	996690	66244	735 2306	77 412 ± 0	567 596 ± 1	412 632 ± 22	364 624 ± 18	328 633 ± 7	331 719 ± 5	584 1699 ± 37	587 1703 ± 38
491	idemia-011	472694	65098	849 3401	189 612 ± 0	840 816 ± 25	598 853 ± 9	398 658 ± 2	463 785 ± 3	342 732 ± 8	766 2583 ± 29	773 2627 ± 48
492	identy-000	271397	14217	146 474	533 2048 ± 0	703 689 ± 0	479 702 ± 0	452 712 ± 3	438 757 ± 0	501 970 ± 1	244 655 ± 25	246 637 ± 23
493	identy-001	385977	17850	469 1187	677 2048 ± 0	791 772 ± 1	592 841 ± 1	725 1056 ± 1	994 1567 ± 5	1021 4081 ± 9	536 1484 ± 16	538 1480 ± 17
494	identy-002	1136161	40480	743 2414	1109 3072 ± 0	1351 1548 ± 0	1061 1584 ± 0	1047 1549 ± 0	1014 1757 ± 1	959 2246 ± 1	830 3020 ± 41	836 3007 ± 19
495	idrnd-000	1069136	69522	847 3357	1263 4104 ± 0	830 810 ± 1	581 828 ± 11	539 830 ± 10	524 877 ± 5	436 857 ± 9	1119 11504 ± 47	1121 11494 ± 62
496	idrnd-001	1080396	107151	853 3437	1259 4104 ± 0	565 594 ± 1	386 615 ± 6	357 615 ± 6	313 616 ± 6	274 640 ± 8	601 1757 ± 8	606 1759 ± 16
497	igearx-face-000	665623	298245	347 885	327 2048 ± 0	887 860 ± 1	600 855 ± 4	550 844 ± 0	527 881 ± 0	476 924 ± 3	570 1628 ± 45	577 1657 ± 41
498	iit-000	237317	33898	-	212 1024 ± 0	128 197 ± 8	-	-	-	-	553 1537 ± 81	484 1282 ± 20
499	iit-001	269176	52055	-	457 2048 ± 0	717 699 ± 4	-	-	-	-	397 1060 ± 48	413 1074 ± 54
500	iit-002	259579	52070	266 731	864 2048 ± 0	464 514 ± 1	316 531 ± 2	303 547 ± 1	284 583 ± 1	343 733 ± 2	385 1023 ± 7	388 1011 ± 66
501	iit-003	261288	53791	311 821	697 2048 ± 0	436 482 ± 0	288 493 ± 0	272 509 ± 0	254 541 ± 0	287 661 ± 0	85 324 ± 17	92 326 ± 8
502	imds-software-001	373399	352623	289 785	580 2048 ± 0	413 465 ± 1	686 958 ± 6	787 1131 ± 5	715 1134 ± 2	607 1119 ± 10	1127 11885 ± 120	1128 11779 ± 174
503	imds-software-002	373632	352627	314 833	819 2048 ± 0	421 469 ± 1	679 954 ± 2	756 1094 ± 5	658 1064 ± 4	631 1153 ± 4	1115 11100 ± 155	1116 11090 ± 145
504	imds-software-003	373648	352628	283 769	785 2048 ± 0	249 317 ± 5	429 654 ± 4	507 793 ± 6	449 770 ± 4	432 848 ± 2	1035 6624 ± 66	1032 6603 ± 77
505	imperial-000	370120	10623	295 796	551 2048 ± 0	664 669 ± 1	453 675 ± 3	421 683 ± 17	370 676 ± 2	307 689 ± 2	680 2130 ± 32	671 2052 ± 100
506	imperial-001	370260	10623	-	433 2048 ± 0	668 671 ± 0	-	-	-	-	674 2090 ± 28	674 2062 ± 74
507	imperial-002	472327	16134	656 1826	717 2048 ± 0	523 569 ± 1	358 581 ± 15	319 575 ± 5	279 576 ± 2	233 588 ± 3	709 2278 ± 90	682 2131 ± 44
508	incode-000	23697	18014	-	227 1024 ± 0	126 196 ± 9	-	-	-	-	981 5175 ± 81	972 4907 ± 77
509	incode-001	155416	18020	-	774 2048 ± 0	449 499 ± 9	-	-	-	-	1023 6154 ± 96	1018 6045 ± 182
510	incode-002	73239	32435	-	552 2048 ± 0	200 281 ± 15	-	-	-	-	554 1544 ± 38	544 1488 ± 69
511	incode-003	170632	42857	-	1197 4096 ± 0	325 384 ± 11	-	-	-	-	646 1928 ± 44	635 1876 ± 81
512	incode-004	260224	51685	-	391 2048 ± 0	433 479 ± 23	-	-	-	-	641 1913 ± 60	744 2443 ± 114
513	incode-005	256242	51670	-	404 2048 ± 0	518 566 ± 1	-	-	-	-	583 1695 ± 38	578 1663 ± 85
514	incode-006	266095	63518	-	725 2048 ± 0	425 472 ± 1	-	-	-	-	609 1788 ± 41	619 1798 ± 59
515	incode-007	266103	63524	-	844 2048 ± 0	422 470 ± 1	307 516 ± 0	277 518 ± 1	247 530 ± 2	248 603 ± 4	614 1799 ± 35	615 1789 ± 59
516	incode-008	266103	21014	-	382 2048 ± 0	453 500 ± 0	289 493 ± 0	261 496 ± 0	232 506 ± 1	209 537 ± 0	404 1070 ± 28	419 1081 ± 34
517	incode-009	266103	21014	-	470 2048 ± 0	455 503 ± 0	287 490 ± 1	263 498 ± 0	231 505 ± 0	207 537 ± 0	420 1102 ± 28	430 1113 ± 29
518	incode-010	627808	21014	768 2543	469 2048 ± 0	1159 1180 ± 2	852 1178 ± 1	825 1182 ± 1	757 1184 ± 1	671 1221 ± 1	446 1164 ± 32	441 1144 ± 32
519	incode-011	477280	21781	566 1483	888 2048 ± 0	898 872 ± 0	618 875 ± 0	578 881 ± 1	538 892 ± 1	483 939 ± 0	425 1117 ± 31	428 1109 ± 37
520	incode-012	477371	21786	564 1479	437 2048 ± 0	469 521 ± 0	302 506 ± 0	267 503 ± 0	237 514 ± 0	228 571 ± 0	740 2441 ± 25	751 2466 ± 37
521	incode-013	483720	41434	609 1647	910 2048 ± 0	485 535 ± 1	333 548 ± 1	307 555 ± 4	259 545 ± 1	255 618 ± 1	441 1152 ± 37	450 1154 ± 41
522	incode-014	2365157	41516	946 6927	1347 8196 ± 0	1074 1064 ± 4	779 1089 ± 2	761 1100 ± 5	688 1107 ± 7	652 1190 ± 3	569 1627 ± 42	572 1640 ± 59
523	incode-015	1808779	70449	938 6430	1321 6148 ± 0	1069 1056 ± 2	859 1182 ± 12	745 1081 ± 2	675 1084 ± 1	651 1187 ± 2	495 1373 ± 22	497 1352 ± 35
524	infocert-001	1204340	38972	568 1490	633 2048 ± 0	903 874 ± 1	629 891 ± 1	721 1050 ± 5	968 1473 ± 2	1006 3174 ± 8	979 5055 ± 108	978 5008 ± 100
525	innefulabs-000	370588	162172	133 439	335 2048 ± 0	1033 1006 ± 3	741 1025 ± 3	705 1030 ± 4	647 1041 ± 2	620 1135 ± 3	1007 5782 ± 41	1008 5741 ± 45
526	innominds-001	102207	777689	445 1124	402 2048 ± 0	267 333 ± 21	168 350 ± 19	124 335 ± 16	114 339 ± 17	84 346 ± 18	751 2482 ± 23	757 2491 ± 29
527	innov8tif-000	170383	2163199	569 1494	1212 4096 ± 0	270 335 ± 23	166 348 ± 21	594 912 ± 64	1062 2661 ± 142	1067 10665 ± 528	180 591 ± 11	184 582 ± 11
528	innovativetechnologyltd-001	177232	335757	101 341	855 2048 ± 0	381 433 ± 7	254 446 ± 8	209 439 ± 4	186 452 ± 4	165 485 ± 7	632 1877 ± 42	646 1924 ± 97

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5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 32: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
529	innovativetechnologyltd-002	173939	372324	353 912	371 2048 ± 0	654 661 ± 2	502 726 ± 4	658 981 ± 27	610 997 ± 40	371 766 ± 3	623 1841 ± 50	631 1857 ± 59
530	innovatrics-000	0	143500	-	15 146 ± 0	531 578 ± 5	-	-	-	-	973 4964 ± 63	958 4665 ± 262
531	innovatrics-001	0	143500	-	63 284 ± 0	635 645 ± 5	-	-	-	-	994 5506 ± 131	975 4975 ± 308
532	innovatrics-002	0	249195	-	169 530 ± 0	82 153 ± 0	-	-	-	-	1148 14384 ± 260	1155 14497 ± 207
533	innovatrics-003	0	538170	-	170 530 ± 0	174 250 ± 0	-	-	-	-	1169 15709 ± 134	1167 15193 ± 292
534	innovatrics-004	0	496988	-	271 1076 ± 0	334 391 ± 0	-	-	-	-	1080 8573 ± 274	1072 7929 ± 244
535	innovatrics-005	0	664175	-	272 1076 ± 0	529 577 ± 1	-	-	-	-	1175 16880 ± 194	1180 17232 ± 385
536	innovatrics-006	0	466269	-	172 538 ± 0	845 820 ± 5	558 799 ± 4	515 805 ± 3	468 796 ± 9	457 890 ± 15	1010 5855 ± 204	986 5266 ± 118
537	innovatrics-007	0	493269	-	270 1064 ± 0	1345 1485 ± 7	1066 1785 ± 184	1068 2078 ± 24	1042 2123 ± 15	954 2210 ± 42	1015 5978 ± 88	1006 5690 ± 102
538	innovatrics-008	307323	59842	553 1429	173 538 ± 0	793 778 ± 6	536 767 ± 3	499 770 ± 3	471 803 ± 3	433 853 ± 10	831 3021 ± 66	779 2673 ± 88
539	innovatrics-009	624485	105187	677 1947	1270 4136 ± 0	1109 1116 ± 1	797 1107 ± 5	765 1104 ± 5	692 1110 ± 5	627 1146 ± 6	976 5051 ± 54	960 4733 ± 102
540	innovatrics-010	604731	111234	624 1715	1269 4136 ± 0	581 611 ± 3	414 632 ± 2	459 723 ± 1	418 730 ± 1	373 768 ± 6	932 4077 ± 42	914 3857 ± 65
541	innovatrics-011	643997	50017	636 1745	1288 4184 ± 0	771 754 ± 2	535 767 ± 3	494 765 ± 3	460 783 ± 4	444 867 ± 3	934 4135 ± 57	924 3937 ± 91
542	innovatrics-012	0	680831	646 1789	1301 4721 ± 0	817 797 ± 3	588 837 ± 3	511 795 ± 1	543 904 ± 4	525 1001 ± 3	1341 80879 ± 981	1339 80521 ± 655
543	innovatrics-013	0	1665828	883 3931	1290 4212 ± 0	1166 1195 ± 2	896 1230 ± 11	856 1223 ± 4	795 1233 ± 5	752 1329 ± 3	1345 85968 ± 990	1343 85796 ± 836
544	innovatrics-014	0	2870004	937 6138	1332 6303 ± 0	1043 1022 ± 6	746 1031 ± 2	722 1051 ± 1	651 1052 ± 5	640 1163 ± 11	1314 60311 ± 644	1311 60186 ± 499
545	innovatrics-015	0	5116879	966 15251	1334 6327 ± 0	1263 1350 ± 5	1005 1405 ± 4	963 1371 ± 3	926 1405 ± 21	857 1502 ± 17	1321 65175 ± 1027	1317 64294 ± 1390
546	innovatrics-016	0	3130540	947 6982	1333 6303 ± 0	1366 2084 ± 0	1077 2097 ± 0	1069 2103 ± 1	1044 2139 ± 0	955 2215 ± 0	1258 32998 ± 309	1260 32967 ± 351
547	insightface-000	806953	16606	-	1167 4096 ± 0	1035 1009 ± 1	739 1019 ± 2	691 1017 ± 2	634 1020 ± 2	544 1032 ± 2	606 1778 ± 31	608 1773 ± 35
548	insightface-001	776777	16606	875 3858	744 2048 ± 0	1269 1366 ± 2	980 1368 ± 3	965 1372 ± 3	901 1375 ± 5	785 1386 ± 4	426 1119 ± 29	426 1108 ± 34
549	insightface-002	800572	16606	-	632 2048 ± 0	1295 1396 ± 2	989 1389 ± 4	986 1403 ± 3	923 1402 ± 2	802 1413 ± 3	447 1169 ± 40	433 1118 ± 38
550	insightface-003	1016917	26668	583 1550	749 2048 ± 0	1081 1073 ± 0	783 1092 ± 2	740 1070 ± 1	674 1082 ± 1	591 1101 ± 1	187 597 ± 16	198 595 ± 17
551	insightface-004	928816	26668	650 1800	401 2048 ± 0	1239 1298 ± 1	976 1356 ± 2	927 1313 ± 1	856 1311 ± 0	761 1349 ± 1	168 565 ± 7	172 559 ± 5
552	inspur-000	364844	91926	300 808	1219 4096 ± 0	1270 1367 ± 1	967 1331 ± 2	961 1368 ± 2	967 1465 ± 1	924 1861 ± 3	1100 9831 ± 37	1100 9860 ± 40
553	inspur-001	364862	91934	315 833	411 2048 ± 0	1286 1385 ± 1	978 1361 ± 4	985 1401 ± 2	978 1495 ± 1	927 1891 ± 1	1002 5641 ± 42	1003 5622 ± 40
554	inspur-002	447948	91934	387 1009	917 2048 ± 0	1068 1056 ± 5	758 1056 ± 7	759 1096 ± 7	1018 1776 ± 23	824 1444 ± 12	949 4504 ± 32	949 4515 ± 35
555	inspur-003	444594	91934	399 1033	434 2048 ± 0	1191 1225 ± 2	871 1199 ± 3	869 1241 ± 1	859 1316 ± 1	900 1645 ± 5	952 4525 ± 16	950 4523 ± 26
556	intellicloudai-001	220831	868246	229 655	473 2048 ± 0	420 468 ± 2	261 456 ± 1	235 466 ± 3	224 492 ± 1	263 632 ± 2	393 1056 ± 4	408 1051 ± 72
557	intellicloudai-002	259047	58559	860 3585	1238 4100 ± 0	877 847 ± 1	595 847 ± 2	554 849 ± 1	507 853 ± 1	451 878 ± 4	328 822 ± 28	334 818 ± 23
558	intellifusion-001	271872	289387	280 762	865 2048 ± 0	780 764 ± 38	542 774 ± 39	512 797 ± 42	472 803 ± 34	398 805 ± 33	421 1112 ± 28	435 1128 ± 41
559	intellifusion-002	762731	385841	363 941	1158 4096 ± 0	980 950 ± 2	791 1096 ± 42	750 1088 ± 33	742 1168 ± 31	643 1171 ± 10	588 1713 ± 57	579 1665 ± 87
560	intellivision-001	43692	11649	-	998 2056 ± 0	20 62 ± 2	-	-	-	-	764 2573 ± 91	765 2544 ± 38
561	intellivision-002	43692	14505	-	1018 2056 ± 0	253 322 ± 1	170 355 ± 2	153 372 ± 1	168 422 ± 2	244 600 ± 1	1143 13525 ± 134	1142 12782 ± 278
562	intellivision-003	64023	133748	296 800	1016 2056 ± 0	353 407 ± 3	211 398 ± 2	191 418 ± 2	185 450 ± 1	235 591 ± 4	1114 11069 ± 56	1115 11066 ± 75
563	intellivision-004	117727	131310	166 515	1011 2056 ± 0	258 330 ± 0	153 330 ± 0	130 347 ± 0	139 382 ± 0	192 514 ± 0	1116 11197 ± 63	1117 11165 ± 72
564	intellivision-005	372608	257259	244 686	996 2056 ± 0	602 618 ± 0	397 623 ± 0	379 634 ± 0	355 659 ± 0	378 771 ± 0	1195 19244 ± 68	1197 19270 ± 77
565	intellivision-006	287736	262742	250 723	1004 2056 ± 0	146 214 ± 0	84 214 ± 0	70 221 ± 0	77 272 ± 0	90 357 ± 1	1162 15153 ± 32	1165 15142 ± 38
566	intellivision-007	192454	262742	125 419	1024 2056 ± 0	79 148 ± 0	45 157 ± 0	40 166 ± 0	36 180 ± 0	54 265 ± 0	1159 15100 ± 50	1161 15095 ± 45
567	intellivix-001	256654	111858	324 846	827 2048 ± 0	315 378 ± 1	191 379 ± 1	162 381 ± 1	140 384 ± 1	129 421 ± 3	419 1100 ± 16	429 1109 ± 22
568	intellivix-002	361566	116162	462 1175	369 2048 ± 0	987 956 ± 0	675 947 ± 6	652 976 ± 0	599 984 ± 4	585 1089 ± 1	1246 30096 ± 128	1251 31287 ± 140
569	intellivix-003	234409	116167	512 1301	623 2048 ± 0	929 908 ± 0	645 916 ± 1	616 930 ± 0	583 961 ± 1	617 1129 ± 3	1245 30025 ± 137	1250 31190 ± 131
570	intellivix-004	361668	128097	473 1189	666 2048 ± 0	375 427 ± 0	243 437 ± 0	214 444 ± 0	196 461 ± 0	226 565 ± 2	542 1498 ± 37	536 1478 ± 16
571	intellivix-005	774405	128093	869 3692	700 2048 ± 0	672 673 ± 1	423 643 ± 3	396 654 ± 3	362 666 ± 3	375 769 ± 5	533 1481 ± 65	524 1451 ± 26
572	intellivix-006	792822	128093	871 3753	565 2048 ± 0	662 665 ± 1	431 657 ± 2	404 662 ± 2	371 677 ± 2	388 784 ± 1	538 1486 ± 13	540 1482 ± 16

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Table 33: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
573	intelresearch-000	388229	307985	-	804 2048 ± 0	925 902 ± 6	-	-	-	-	965 4800 ± 152	954 4561 ± 97
574	intelresearch-001	353997	272602	-	809 2048 ± 0	687 682 ± 4	-	-	-	-	888 3553 ± 57	884 3462 ± 161
575	intelresearch-002	452850	86454	-	589 2048 ± 0	726 707 ± 2	552 790 ± 33	504 788 ± 26	494 831 ± 29	440 862 ± 22	935 4204 ± 91	936 4153 ± 93
576	intelresearch-003	401343	85085	463 1177	556 2048 ± 0	1194 1232 ± 3	901 1237 ± 2	870 1242 ± 2	822 1263 ± 2	744 1324 ± 3	947 4443 ± 75	942 4374 ± 77
577	intelresearch-004	646918	85290	664 1866	638 2048 ± 0	1251 1319 ± 2	960 1322 ± 3	938 1330 ± 3	876 1345 ± 3	799 1411 ± 5	959 4696 ± 63	959 4692 ± 66
578	intelresearch-005	398137	85290	458 1164	805 2048 ± 0	1255 1328 ± 1	970 1334 ± 2	948 1344 ± 2	882 1356 ± 2	809 1423 ± 4	951 4524 ± 87	945 4461 ± 74
579	intelresearch-006	445223	101126	419 1069	709 2048 ± 0	946 918 ± 1	623 881 ± 0	582 892 ± 0	547 913 ± 1	532 1008 ± 3	1021 6137 ± 410	1017 6024 ± 109
580	intelresearch-007	523218	101150	478 1197	480 2048 ± 0	557 590 ± 1	363 585 ± 1	330 588 ± 1	300 603 ± 4	294 668 ± 6	903 3738 ± 42	909 3752 ± 53
581	intelresearch-008	523218	101214	477 1196	903 2048 ± 0	621 634 ± 1	407 630 ± 1	372 632 ± 1	329 635 ± 2	325 711 ± 4	896 3661 ± 34	898 3641 ± 44
582	intelresearch-009	290599	120716	577 1535	846 2048 ± 0	511 560 ± 1	437 664 ± 3	386 638 ± 3	372 678 ± 13	311 692 ± 4	911 3829 ± 207	902 3679 ± 71
583	intelresearch-010	307886	120767	613 1655	406 2048 ± 0	1135 1153 ± 1	840 1158 ± 2	810 1160 ± 2	738 1166 ± 3	679 1237 ± 5	913 3850 ± 26	913 3822 ± 75
584	intelresearch-011	317134	120757	640 1758	398 2048 ± 0	1197 1236 ± 4	886 1219 ± 3	864 1231 ± 1	801 1237 ± 3	734 1312 ± 6	915 3873 ± 47	917 3890 ± 57
585	intelresearch-012	317135	120715	639 1758	710 2048 ± 0	1225 1280 ± 2	914 1256 ± 4	894 1270 ± 3	840 1284 ± 3	753 1331 ± 5	905 3744 ± 32	905 3722 ± 44
586	intema-000	1532392	19488	430 1088	148 513 ± 0	1037 1010 ± 0	727 1001 ± 4	672 994 ± 0	605 993 ± 5	560 1056 ± 1	354 910 ± 29	360 906 ± 32
587	intema-001	1122562	19536	561 1458	152 513 ± 0	1266 1354 ± 1	957 1318 ± 5	943 1336 ± 4	868 1328 ± 2	777 1375 ± 0	369 977 ± 31	375 980 ± 31
588	interlinklabs-001	155897	1013105	273 746	514 2048 ± 0	257 328 ± 3	164 346 ± 8	129 343 ± 7	117 352 ± 3	128 418 ± 11	518 1441 ± 10	523 1450 ± 14
589	interlinklabs-002	286341	1013147	532 1364	1220 4096 ± 0	389 438 ± 1	241 435 ± 4	204 435 ± 5	180 439 ± 0	181 505 ± 2	778 2699 ± 35	781 2678 ± 25
590	interlinklabs-003	528962	951057	582 1549	1226 4096 ± 0	754 734 ± 0	522 750 ± 0	481 746 ± 0	448 769 ± 0	480 932 ± 0	883 3513 ± 50	888 3504 ± 26
591	intozi-001	21863	74210	41 140	617 2048 ± 0	32 85 ± 0	19 86 ± 0	15 86 ± 0	12 87 ± 0	10 87 ± 0	1093 9579 ± 252	1090 9530 ± 167
592	intsysmsu-000	650193	171481	-	872 2048 ± 0	484 535 ± 20	-	-	-	-	202 610 ± 22	223 613 ± 31
593	intsysmsu-001	384409	172480	292 789	752 2048 ± 0	594 614 ± 2	387 615 ± 2	391 642 ± 2	433 750 ± 3	637 1159 ± 4	213 621 ± 8	217 611 ± 31
594	intsysmsu-002	765921	172298	291 786	247 1024 ± 0	561 593 ± 1	554 793 ± 2	533 827 ± 1	521 875 ± 104	719 1293 ± 3	162 549 ± 25	168 548 ± 29
595	ionetworks-000	287609	51236	105 352	746 2048 ± 0	378 430 ± 0	240 435 ± 0	203 433 ± 0	174 432 ± 0	142 444 ± 0	1045 6913 ± 102	1051 7150 ± 160
596	ionetworks-001	39860	333205	88 298	763 2048 ± 0	390 439 ± 2	237 433 ± 2	232 461 ± 2	189 454 ± 2	168 488 ± 2	1030 6335 ± 103	1027 6358 ± 91
597	ionetworks-002	337801	73038	637 1746	598 2048 ± 0	700 689 ± 1	449 672 ± 5	410 665 ± 3	365 669 ± 3	289 664 ± 6	1043 6884 ± 154	1039 6808 ± 102
598	ionetworks-003	309918	68642	603 1631	935 2050 ± 0	734 713 ± 0	458 681 ± 1	411 665 ± 0	363 668 ± 0	295 671 ± 0	1109 10649 ± 225	1111 10658 ± 106
599	iqface-000	268819	596337	248 704	1302 4750 ± 32	488 538 ± 26	291 494 ± 2	300 543 ± 3	424 734 ± 4	790 1393 ± 4	1363 636433 ± 38446	1363 632654 ± 85615
600	iqface-001	1145590	760941	-	1303 4752 ± 35	574 603 ± 1	-	-	-	-	1361 568761 ± 3659	1361 570335 ± 5122
601	iqface-003	370803	963398	312 821	1304 4763 ± 37	474 529 ± 1	318 532 ± 2	338 599 ± 8	506 850 ± 2	905 1694 ± 2	1362 575924 ± 2601	1362 576653 ± 2051
602	iqsec-001	172239	41022	329 850	815 2048 ± 0	178 258 ± 6	104 254 ± 4	244 474 ± 9	702 1124 ± 24	1022 4155 ± 119	1226 24586 ± 143	1232 25631 ± 157
603	iqsec-002	172239	41022	331 852	813 2048 ± 0	166 243 ± 6	106 259 ± 4	269 504 ± 10	755 1184 ± 25	1020 4081 ± 124	1227 24688 ± 149	1233 25737 ± 142
604	irex-000	741899	47419	701 2090	1113 3080 ± 0	882 852 ± 2	597 850 ± 1	571 874 ± 2	567 939 ± 1	686 1249 ± 5	42 201 ± 11	45 208 ± 8
605	isap-001	99049	204201	1 18	1180 4096 ± 0	1 0 ± 0	-	-	-	-	127 459 ± 17	136 456 ± 11
606	isap-002	256765	49931	85 288	727 2048 ± 0	787 769 ± 3	742 1027 ± 2	574 877 ± 2	442 761 ± 1	469 912 ± 2	834 3045 ± 94	828 2973 ± 66
607	isityou-000	48010	36621	28 110	1362 19200 ± 0	53 113 ± 5	-	-	-	-	1355 237517 ± 1318	1355 237374 ± 1279
608	isystems-000	209270	713870	-	241 1024 ± 0	83 154 ± 4	-	-	-	-	112 398 ± 14	119 396 ± 16
609	isystems-001	274621	639268	434 1091	668 2048 ± 0	211 291 ± 9	-	-	-	-	164 557 ± 16	174 564 ± 22
610	isystems-002	358984	803389	596 1595	323 2048 ± 0	851 822 ± 8	-	-	-	-	296 749 ± 31	240 632 ± 28
611	itmo-001	1923215	62191	-	1367 37997 ± 0	990 959 ± 18	-	-	-	-	1242 28901 ± 1492	1243 27517 ± 186
612	itmo-002	1923215	62191	-	1279 4162 ± 0	584 611 ± 17	-	-	-	-	1061 7423 ± 96	1061 7451 ± 94
613	itmo-003	579961	82630	-	1075 2114 ± 0	28 79 ± 2	-	-	-	-	1102 10038 ± 180	1103 10030 ± 134
614	itmo-004	487023	79012	-	1073 2100 ± 0	383 436 ± 0	-	-	-	-	1073 8219 ± 100	1077 8214 ± 130
615	itmo-005	482155	81168	-	1283 4173 ± 0	779 759 ± 1	-	-	-	-	1140 13214 ± 164	1141 12576 ± 257
616	itmo-006	599187	96762	-	1080 2121 ± 0	836 814 ± 1	584 831 ± 26	538 830 ± 17	493 830 ± 3	493 952 ± 38	1234 26154 ± 148	1235 26217 ± 260

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	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480X720	960X1440	1600X2400	3000X4500	GENUINE	IMPOSTOR
617	itmo-007	415979	245376	719 2199	422 2048 ± 0	761 741 ± 2	-	-	-	-	760 2551 ± 50	762 2529 ± 80
618	itmo-008	726866	318238	536 1376	1169 4096 ± 0	1072 1060 ± 1	761 1058 ± 1	728 1059 ± 1	667 1072 ± 4	595 1104 ± 1	890 3578 ± 25	896 3580 ± 28
619	ivacognitive-001	256958	62791	374 975	751 2048 ± 0	1236 1292 ± 3	935 1289 ± 4	909 1292 ± 4	843 1292 ± 3	740 1321 ± 4	936 4228 ± 41	937 4226 ± 41
620	iws-000	30875	3063	18 77	143 512 ± 0	194 277 ± 5	124 283 ± 1	257 494 ± 3	598 984 ± 3	1001 2987 ± 39	377 999 ± 40	380 992 ± 22
621	jaakit-001	99024	24754	73 251	128 512 ± 0	25 76 ± 0	16 77 ± 0	12 79 ± 0	11 81 ± 0	12 93 ± 0	747 2466 ± 57	750 2465 ± 66
622	jaakit-002	179256	75037	80 277	562 2048 ± 0	776 758 ± 0	531 760 ± 0	610 925 ± 0	860 1318 ± 1	993 2799 ± 2	359 943 ± 7	369 963 ± 5
623	kakao-001	107616	285676	-	215 1024 ± 0	317 379 ± 1	-	-	-	-	357 930 ± 22	367 948 ± 38
624	kakao-002	479406	412822	-	426 2048 ± 0	764 747 ± 6	-	-	-	-	590 1720 ± 62	592 1715 ± 83
625	kakao-003	414379	113944	-	558 2048 ± 0	907 878 ± 3	-	-	-	-	679 2128 ± 34	684 2134 ± 60
626	kakao-004	414411	135270	-	449 2048 ± 0	885 856 ± 1	601 855 ± 0	560 857 ± 0	515 858 ± 0	439 860 ± 1	653 1957 ± 28	655 1953 ± 37
627	kakao-005	414316	152216	-	955 2052 ± 0	1078 1068 ± 1	767 1073 ± 1	743 1079 ± 0	669 1077 ± 1	584 1089 ± 1	670 2067 ± 26	667 2043 ± 34
628	kakao-007	526993	129545	836 3150	564 2048 ± 0	985 952 ± 1	689 961 ± 1	638 958 ± 1	584 962 ± 1	500 968 ± 1	394 1056 ± 16	402 1047 ± 28
629	kakao-008	734583	104820	878 3879	453 2048 ± 0	1118 1135 ± 3	834 1148 ± 3	802 1150 ± 3	732 1156 ± 1	647 1175 ± 1	293 736 ± 23	301 727 ± 22
630	kakao-009	766989	104820	887 4042	349 2048 ± 0	562 593 ± 1	375 603 ± 4	352 613 ± 2	314 617 ± 2	269 636 ± 4	126 457 ± 20	131 448 ± 17
631	kakaobank-000	570796	98479	787 2690	1139 4096 ± 0	1195 1234 ± 1	911 1254 ± 7	875 1248 ± 3	910 1389 ± 3	921 1843 ± 11	964 4790 ± 35	965 4803 ± 35
632	kakaobank-001	780621	98829	718 2189	609 2048 ± 0	543 584 ± 0	380 608 ± 1	345 607 ± 5	376 684 ± 1	474 922 ± 2	1240 27092 ± 174	1242 27065 ± 158
633	kakaobank-002	780621	98833	758 2459	474 2048 ± 0	1031 1004 ± 1	733 1010 ± 0	698 1025 ± 5	672 1078 ± 1	737 1313 ± 1	1238 26972 ± 118	1240 27022 ± 139
634	kakaobank-003	1409862	98833	892 4186	789 2048 ± 0	1165 1194 ± 2	892 1224 ± 6	863 1231 ± 2	824 1269 ± 5	875 1535 ± 5	1239 26986 ± 183	1241 27026 ± 151
635	kakaopay-001	397864	179869	243 685	1148 4096 ± 0	395 448 ± 0	325 542 ± 0	296 542 ± 0	255 542 ± 0	218 553 ± 0	227 633 ± 22	232 630 ± 22
636	kasikornlabs-000	256471	61000	228 655	513 2048 ± 0	931 908 ± 36	620 878 ± 22	647 969 ± 39	756 1184 ± 54	972 2382 ± 145	1251 31669 ± 188	1252 31714 ± 182
637	kasikornlabs-001	256471	61037	239 676	628 2048 ± 0	935 912 ± 38	610 868 ± 10	686 1005 ± 50	749 1176 ± 44	973 2387 ± 147	1248 30759 ± 198	1248 30867 ± 174
638	kasikornlabs-002	256431	61063	209 613	712 2048 ± 0	944 917 ± 35	640 907 ± 13	643 963 ± 13	863 1320 ± 45	983 2629 ± 178	1250 31025 ± 180	1249 31054 ± 186
639	kasikornlabs-003	256442	61063	276 751	807 2048 ± 0	643 652 ± 5	430 656 ± 5	489 755 ± 11	625 1007 ± 27	958 2240 ± 168	1222 24022 ± 121	1223 23998 ± 97
640	kasikornlabs-004	466064	61063	405 1045	818 2048 ± 0	979 950 ± 7	696 970 ± 4	706 1031 ± 11	899 1372 ± 30	970 2368 ± 156	1219 23867 ± 56	1221 23919 ± 91
641	kasikornlabs-005	466202	61063	395 1028	760 2048 ± 0	959 936 ± 8	684 956 ± 14	727 1057 ± 14	805 1243 ± 28	962 2285 ± 145	1221 23900 ± 44	1222 23923 ± 56
642	kbyai-000	502373	34357	746 2417	68 296 ± 0	1174 1202 ± 3	1079 2167 ± 3	1075 2293 ± 9	1059 2586 ± 13	1015 3689 ± 20	1180 17785 ± 51	1184 17801 ± 125
643	kedacom-000	245292	37401	971 23574	66 292 ± 0	457 506 ± 3	331 547 ± 10	354 614 ± 9	290 588 ± 10	290 665 ± 24	254 684 ± 14	268 682 ± 16
644	keyless-000	551302	27472	457 1157	389 2048 ± 0	599 615 ± 0	508 736 ± 5	1070 2122 ± 2	1041 2086 ± 1	944 2110 ± 4	353 909 ± 8	357 905 ± 16
645	kiwitech-000	369711	21375	319 841	423 2048 ± 0	558 591 ± 0	370 594 ± 0	337 595 ± 1	298 596 ± 0	250 609 ± 0	599 1755 ± 20	601 1734 ± 16
646	kloudspot-001	261662	887420	344 882	653 2048 ± 0	260 330 ± 1	146 319 ± 6	118 325 ± 1	99 318 ± 0	68 318 ± 0	996 5539 ± 48	998 5555 ± 66
647	kloudspot-002	635738	460698	579 1540	1210 4096 ± 0	1115 1128 ± 1	815 1128 ± 2	781 1123 ± 0	733 1158 ± 2	618 1132 ± 0	990 5456 ± 154	991 5460 ± 108
648	kneron-003	58366	1747	62 188	711 2048 ± 0	201 281 ± 3	122 280 ± 1	112 315 ± 13	127 365 ± 7	674 1224 ± 30	986 5237 ± 63	987 5274 ± 99
649	kneron-005	375374	13633	140 457	340 2048 ± 0	468 518 ± 2	311 522 ± 4	308 556 ± 5	439 757 ± 19	914 1760 ± 25	645 1922 ± 11	647 1926 ± 20
650	knowutech-000	808045	32886	515 1312	291 1536 ± 0	1311 1419 ± 2	982 1372 ± 1	968 1377 ± 1	903 1382 ± 2	786 1386 ± 2	904 3743 ± 31	903 3693 ± 38
651	kogniza-001	0	394421	504 1288	287 1536 ± 0	1230 1285 ± 2	946 1304 ± 4	903 1280 ± 2	833 1278 ± 2	748 1326 ± 2	824 2968 ± 37	827 2971 ± 20
652	kookmin-001	234001	31875	-	431 2048 ± 0	55 114 ± 1	29 110 ± 1	25 116 ± 1	25 128 ± 1	26 172 ± 1	221 629 ± 35	226 616 ± 11
653	kookmin-002	371771	30734	313 827	795 2048 ± 0	1059 1038 ± 2	756 1047 ± 1	717 1045 ± 1	656 1061 ± 1	603 1116 ± 1	233 638 ± 19	245 636 ± 20
654	koreaid-001	256261	20152	653 1810	479 2048 ± 0	326 384 ± 2	203 390 ± 1	213 444 ± 2	267 556 ± 6	393 795 ± 5	230 636 ± 11	244 636 ± 10
655	krungthai-002	2360957	15033	468 1185	635 2048 ± 0	235 308 ± 0	140 314 ± 5	108 309 ± 0	101 319 ± 0	93 362 ± 0	828 3014 ± 20	829 2980 ± 22
656	kuke3d-001	403462	68786	173 530	1155 4096 ± 0	837 814 ± 2	565 811 ± 2	521 814 ± 2	477 814 ± 1	424 834 ± 1	1033 6412 ± 57	1029 6413 ± 51
657	kuke3d-002	270544	1227855	309 820	661 2048 ± 0	456 504 ± 3	299 504 ± 1	273 511 ± 1	243 523 ± 2	232 585 ± 1	821 2943 ± 22	825 2966 ± 38
658	lebentech-000	0	10360	2 26	102 512 ± 0	3 22 ± 0	1 22 ± 0	1 22 ± 0	1 23 ± 0	1 23 ± 0	321 801 ± 42	336 825 ± 51
659	lebentech-001	0	144456	590 1567	321 2048 ± 0	98 174 ± 0	53 175 ± 0	59 200 ± 1	61 227 ± 9	118 397 ± 20	141 485 ± 17	144 473 ± 28
660	lemalabs-001	748400	198794	800 2745	647 2048 ± 0	831 810 ± 0	566 812 ± 0	520 813 ± 0	483 819 ± 0	429 844 ± 1	1128 11930 ± 35	1131 11913 ± 37

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	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
661	lightvision-000	182569	62181	360 930	332 2048 ± 0	357 411 ± 1	192 381 ± 0	161 379 ± 1	142 386 ± 3	116 396 ± 2	535 1484 ± 13	535 1477 ± 13
662	lightvision-001	266840	62181	600 1604	833 2048 ± 0	477 530 ± 2	312 523 ± 2	297 542 ± 1	262 548 ± 10	206 537 ± 1	521 1456 ± 10	528 1457 ± 14
663	lineclova-000	264443	407003	-	683 2048 ± 0	549 586 ± 0	382 612 ± 0	347 609 ± 1	305 611 ± 0	257 618 ± 1	789 2753 ± 19	791 2745 ± 23
664	lineclova-001	944355	407058	724 2233	806 2048 ± 0	863 833 ± 10	582 830 ± 3	535 828 ± 4	499 838 ± 8	421 833 ± 4	777 2696 ± 23	780 2677 ± 35
665	lineclova-002	475779	406756	524 1352	641 2048 ± 0	1229 1284 ± 1	927 1275 ± 2	900 1275 ± 1	830 1273 ± 2	709 1281 ± 2	791 2765 ± 10	793 2767 ± 31
666	lineclova-003	585149	410482	628 1725	585 2048 ± 0	1321 1444 ± 1	1029 1438 ± 1	1007 1439 ± 2	950 1440 ± 1	827 1446 ± 2	812 2890 ± 23	817 2899 ± 29
667	lookman-002	138200	25410	967 16518	182 548 ± 0	95 173 ± 1	-	-	-	-	201 610 ± 19	219 612 ± 22
668	lookman-004	244775	37401	970 23548	183 548 ± 0	459 507 ± 5	329 545 ± 12	353 613 ± 12	294 590 ± 11	282 656 ± 16	339 871 ± 29	348 878 ± 29
669	luxand-000	0	57908	533 1366	263 1040 ± 0	354 407 ± 23	236 433 ± 11	215 444 ± 14	202 464 ± 14	224 562 ± 25	331 828 ± 28	337 828 ± 32
670	luxand-001	85194	72189	220 636	834 2048 ± 0	379 431 ± 0	250 443 ± 0	212 443 ± 2	183 448 ± 0	196 519 ± 0	514 1433 ± 16	520 1433 ± 16
671	luxand-003	127425	72189	327 847	814 2048 ± 0	725 706 ± 4	474 697 ± 1	438 698 ± 3	387 694 ± 0	386 782 ± 3	519 1443 ± 17	519 1431 ± 17
672	luxand-004	127425	72189	328 848	606 2048 ± 0	679 677 ± 0	460 682 ± 0	430 691 ± 0	398 705 ± 0	370 766 ± 0	517 1441 ± 10	521 1440 ± 11
673	mantra-000	471458	62566	274 749	939 2052 ± 0	359 413 ± 18	286 487 ± 19	259 494 ± 18	235 511 ± 18	242 598 ± 19	841 3151 ± 51	845 3127 ± 63
674	matrixcomsec-000	114103	177320	79 264	793 2048 ± 0	38 94 ± 0	22 94 ± 0	17 95 ± 0	34 173 ± 1	20 140 ± 1	211 616 ± 22	234 630 ± 28
675	matrixcomsec-001	179657	168204	450 1141	370 2048 ± 0	91 166 ± 0	49 168 ± 0	42 169 ± 0	33 171 ± 0	30 191 ± 0	62 268 ± 53	69 261 ± 62
676	maverickresearch-000	256262	20268	97 331	861 2048 ± 0	1025 995 ± 1	725 999 ± 1	680 999 ± 2	609 997 ± 0	539 1023 ± 2	1201 20268 ± 108	1203 20254 ± 121
677	maxvision-000	133114	56426	-	87 512 ± 0	294 359 ± 0	173 356 ± 0	143 359 ± 0	121 356 ± 0	97 370 ± 1	746 2461 ± 20	746 2452 ± 17
678	maxvision-001	256146	61793	828 3037	542 2048 ± 0	193 275 ± 3	117 274 ± 2	87 277 ± 4	80 280 ± 4	69 325 ± 3	280 714 ± 13	295 717 ± 13
679	maxvision-002	171894	60623	641 1765	376 2048 ± 0	94 172 ± 0	52 171 ± 0	43 172 ± 0	35 174 ± 0	38 221 ± 0	286 725 ± 5	299 725 ± 5
680	maxvision-003	234062	61252	755 2452	853 2048 ± 0	427 474 ± 0	271 468 ± 0	241 471 ± 0	211 475 ± 0	195 519 ± 0	749 2467 ± 28	754 2488 ± 23
681	maxvision-004	394121	61583	838 3217	698 2048 ± 0	633 644 ± 1	426 648 ± 0	393 647 ± 1	333 637 ± 1	315 695 ± 1	638 1897 ± 10	641 1903 ± 14
682	maxvision-005	309326	61739	710 2138	898 2048 ± 0	1034 1007 ± 1	906 1245 ± 5	692 1017 ± 1	646 1040 ± 4	723 1299 ± 3	651 1950 ± 38	654 1948 ± 34
683	maxvision-006	315987	61739	837 3172	362 2048 ± 0	1206 1247 ± 3	879 1208 ± 3	849 1211 ± 5	783 1215 ± 1	702 1268 ± 4	650 1938 ± 17	648 1929 ± 35
684	mbbankvn-000	472410	139431	893 4227	544 2048 ± 0	415 466 ± 17	277 480 ± 26	248 481 ± 27	215 479 ± 21	175 501 ± 29	944 4388 ± 14	943 4380 ± 17
685	megvii-000	1358915	16014	-	339 2048 ± 0	803 785 ± 0	-	-	-	-	1197 19816 ± 158	1199 19805 ± 174
686	megvii-001	1361523	16486	-	783 2048 ± 0	496 543 ± 0	-	-	-	-	985 5228 ± 32	985 5252 ± 60
687	megvii-002	1809564	16491	-	1233 4100 ± 0	632 644 ± 0	-	-	-	-	1299 50630 ± 183	1293 47591 ± 716
688	megvii-003	4430290	42790	-	1205 4096 ± 0	1176 1210 ± 1	891 1223 ± 0	957 1356 ± 4	998 1582 ± 7	987 2727 ± 23	1353 225342 ± 3574	1354 225413 ± 6344
689	megvii-004	3962505	44019	-	1229 4097 ± 0	1231 1287 ± 1	981 1369 ± 2	924 1310 ± 2	905 1384 ± 3	820 1436 ± 5	1289 46801 ± 204	1290 46832 ± 207
690	megvii-005	1378009	44038	886 4025	924 2049 ± 0	1250 1319 ± 5	908 1247 ± 6	867 1240 ± 2	807 1245 ± 2	722 1298 ± 3	1255 32025 ± 121	1256 32008 ± 114
691	megvii-006	1554938	44038	897 4346	934 2049 ± 0	1232 1287 ± 3	933 1286 ± 0	978 1393 ± 5	861 1319 ± 1	766 1360 ± 1	1253 31845 ± 100	1254 31872 ± 118
692	megvii-007	1366028	44035	627 1723	931 2049 ± 0	1131 1148 ± 1	835 1153 ± 0	817 1172 ± 4	747 1172 ± 2	715 1288 ± 2	1200 20191 ± 1753	1201 20191 ± 1620
693	megvii-008	1644071	44035	700 2086	926 2049 ± 0	1248 1313 ± 1	1003 1404 ± 4	959 1363 ± 2	889 1362 ± 3	806 1420 ± 2	1198 20059 ± 1598	1205 20448 ± 1633
694	megvii-009	1644071	44039	730 2294	923 2049 ± 0	1253 1322 ± 1	965 1328 ± 1	946 1339 ± 3	1040 2075 ± 3	796 1404 ± 4	1199 20081 ± 1621	1204 20260 ± 1577
695	meituan-000	259514	333178	-	791 2048 ± 0	382 436 ± 4	247 441 ± 1	366 626 ± 5	681 1098 ± 15	1004 3126 ± 53	234 638 ± 17	241 633 ± 16
696	meituan-001	615387	333249	440 1113	693 2048 ± 0	1041 1017 ± 4	731 1008 ± 3	689 1010 ± 2	630 1010 ± 3	533 1011 ± 4	242 654 ± 10	260 658 ± 14
697	meituan-002	686111	244091	720 2200	1171 4096 ± 0	1064 1052 ± 0	777 1086 ± 1	736 1064 ± 2	655 1060 ± 5	569 1063 ± 1	400 1064 ± 10	411 1070 ± 16
698	meituan-003	860010	244091	807 2772	1211 4096 ± 0	1347 1487 ± 1	1054 1518 ± 0	1027 1469 ± 6	973 1478 ± 0	839 1471 ± 7	422 1112 ± 16	424 1097 ± 20
699	meituan-004	850507	244091	803 2759	1199 4096 ± 0	813 796 ± 1	573 822 ± 0	530 820 ± 11	481 815 ± 11	408 824 ± 0	435 1149 ± 10	445 1148 ± 5
700	meiya-001	280055	264913	160 507	932 2049 ± 0	606 622 ± 12	-	-	-	-	1075 8356 ± 615	1075 8134 ± 97
701	mendaxiatech-000	1941475	45484	901 4397	1230 4097 ± 0	1203 1243 ± 2	913 1255 ± 1	966 1373 ± 2	1000 1598 ± 3	985 2689 ± 8	1290 46906 ± 275	1291 46872 ± 217
702	metsakuurcompany-001	445177	1091558	594 1588	1036 2056 ± 0	532 578 ± 1	366 587 ± 3	331 590 ± 1	352 659 ± 1	435 854 ± 1	1081 8600 ± 192	1076 8155 ± 298
703	metsakuurcompany-002	0	957558	377 980	1006 2056 ± 0	1012 980 ± 1	706 978 ± 1	651 976 ± 2	621 1005 ± 1	594 1103 ± 2	1083 8766 ± 326	1084 8786 ± 324
704	metsakuurcompany-003	0	957562	386 1004	990 2056 ± 0	996 965 ± 2	694 970 ± 5	731 1060 ± 12	623 1005 ± 6	610 1121 ± 1	1074 8234 ± 145	1074 8111 ± 280

Notes	
1	The configuration size does not capture static data included in libraries.
2	The library size is the combined total of all files provided in the submission lib folder. These libraries e.g. OpenCV may or may not be installed on any end user's platform natively and would not need to be installed with the algorithm. Some developers put neural network models in their libraries.
3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 36: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE							COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
705	metsakuurcompany-004	0	1035754	411 1056	1019 2056 ± 0	973 946 ± 10	603 861 ± 6	575 877 ± 3	555 926 ± 4	516 991 ± 5	1029 6281 ± 160	1025 6232 ± 191
706	metsakuurcompany-005	0	305952	234 661	891 2048 ± 0	424 472 ± 0	274 477 ± 0	256 494 ± 1	245 527 ± 1	383 778 ± 2	868 3376 ± 22	873 3383 ± 40
707	miaxis-001	0	215019	95 325	93 512 ± 0	198 279 ± 0	121 278 ± 0	89 278 ± 1	81 285 ± 0	62 297 ± 0	340 872 ± 14	350 881 ± 22
708	miaxis-002	0	216484	96 328	141 512 ± 0	212 292 ± 0	127 290 ± 1	100 297 ± 0	90 298 ± 0	91 359 ± 1	402 1065 ± 48	399 1040 ± 54
709	miaxis-003	0	439726	202 604	436 2048 ± 0	623 634 ± 0	400 624 ± 2	351 613 ± 0	244 524 ± 0	291 665 ± 0	669 2053 ± 20	669 2048 ± 28
710	miaxis-004	729303	89655	467 1183	928 2049 ± 0	1362 1941 ± 0	-	1061 1940 ± 0	1071 3153 ± 0	933 1963 ± 0	1347 103338 ± 44	1347 103361 ± 65
711	microfocus-000	103483	27242	-	39 256 ± 0	183 263 ± 18	-	-	-	-	43 202 ± 5	41 203 ± 7
712	microfocus-001	104524	27242	-	38 256 ± 0	184 264 ± 18	-	-	-	-	40 215 ± 8	47 217 ± 10
713	microfocus-002	96288	27362	59 176	24 256 ± 0	179 259 ± 18	-	-	-	-	88 337 ± 34	52 230 ± 25
714	microfocus-003	169603	27689	161 507	27 256 ± 0	444 490 ± 19	308 517 ± 30	485 752 ± 55	707 1126 ± 121	986 2713 ± 345	20 121 ± 5	19 117 ± 5
715	minivision-000	836697	16597	895 4263	1225 4096 ± 0	1058 1035 ± 1	751 1033 ± 2	708 1035 ± 1	642 1037 ± 1	565 1059 ± 2	748 2466 ± 26	748 2460 ± 25
716	mitek-000	105584	44643	81 277	223 1024 ± 0	177 256 ± 21	108 265 ± 10	156 375 ± 24	258 545 ± 42	590 1098 ± 124	804 2846 ± 88	796 2777 ± 74
717	mitek-001	519928	69522	644 1777	988 2056 ± 0	310 371 ± 0	208 397 ± 0	181 407 ± 4	151 394 ± 5	126 416 ± 2	1038 6682 ± 28	1036 6694 ± 48
718	mitek-002	534528	68069	643 1773	989 2056 ± 0	301 365 ± 0	188 372 ± 0	148 366 ± 2	136 377 ± 2	115 394 ± 1	379 1005 ± 19	370 963 ± 23
719	mobai-000	365451	80573	290 786	1318 6144 ± 0	782 766 ± 8	611 869 ± 6	845 1205 ± 31	1024 1867 ± 45	1013 3549 ± 190	1173 16458 ± 333	1176 16423 ± 1473
720	mobai-001	265297	60164	174 534	726 2048 ± 0	590 612 ± 3	385 614 ± 3	426 687 ± 9	533 886 ± 31	908 1707 ± 103	497 1386 ± 25	506 1377 ± 26
721	mobai-002	254811	33242	565 1482	724 2048 ± 0	288 356 ± 0	181 366 ± 0	142 359 ± 4	129 367 ± 2	132 428 ± 0	1076 8387 ± 126	1078 8381 ± 105
722	mobbl-000	182052	58727	-	915 2048 ± 0	180 261 ± 16	110 267 ± 22	155 375 ± 92	349 655 ± 273	940 2059 ± 1129	1131 12061 ± 142	1133 12050 ± 133
723	mobbl-001	231160	58706	71 226	753 2048 ± 0	110 183 ± 32	63 184 ± 25	139 354 ± 76	488 823 ± 396	991 2781 ± 1166	1126 11832 ± 109	1130 11851 ± 88
724	mobbl-002	242920	60119	-	742 2048 ± 0	657 663 ± 6	433 660 ± 5	406 662 ± 5	357 663 ± 5	298 676 ± 5	1122 11616 ± 78	1123 11588 ± 97
725	mobbl-003	172248	60960	82 282	897 2048 ± 0	659 664 ± 6	436 661 ± 5	407 663 ± 5	359 665 ± 6	309 691 ± 5	1138 12506 ± 111	1140 12509 ± 100
726	mobbl-004	432204	970955	337 872	722 2048 ± 0	209 288 ± 0	123 281 ± 0	91 281 ± 1	84 288 ± 2	63 312 ± 2	861 3327 ± 22	872 3369 ± 48
727	mobbl-005	352570	983522	376 978	867 2048 ± 0	1092 1098 ± 1	811 1125 ± 2	780 1123 ± 2	740 1167 ± 2	764 1354 ± 1	992 5498 ± 62	994 5492 ± 53
728	mobipintech-000	370514	303291	461 1173	408 2048 ± 0	1204 1245 ± 1	897 1234 ± 1	890 1264 ± 1	888 1360 ± 1	907 1707 ± 1	1152 14506 ± 214	1154 14433 ± 197
729	momovn-001	246938	1013076	284 769	689 2048 ± 0	158 237 ± 1	113 268 ± 7	107 308 ± 10	86 293 ± 5	111 390 ± 3	516 1438 ± 13	522 1443 ± 13
730	momovn-002	320036	1013104	275 750	503 2048 ± 0	165 243 ± 3	100 248 ± 0	80 245 ± 1	70 253 ± 0	72 328 ± 2	520 1454 ± 8	526 1456 ± 16
731	momovn-003	528962	951056	581 1548	1188 4096 ± 0	784 766 ± 1	544 777 ± 0	503 783 ± 0	479 815 ± 1	551 1045 ± 1	923 3979 ± 23	929 3984 ± 29
732	moredian-000	525259	21374	402 1035	549 2048 ± 0	711 694 ± 0	475 698 ± 0	439 699 ± 0	393 700 ± 0	326 713 ± 1	618 1803 ± 11	611 1779 ± 23
733	morpho-000	100806	107129	-	2 116 ± 0	52 109 ± 1	-	-	-	-	373 993 ± 31	383 1000 ± 34
734	morpho-001	100806	368573	-	3 116 ± 0	12 41 ± 1	-	-	-	-	386 1030 ± 38	400 1042 ± 37
735	morpho-002	383021	110995	-	71 352 ± 0	358 411 ± 7	-	-	-	-	894 3620 ± 94	753 2481 ± 65
736	mukh-001	866223	451194	608 1647	216 1024 ± 0	1275 1375 ± 17	990 1390 ± 12	989 1406 ± 8	914 1394 ± 10	767 1360 ± 11	119 433 ± 14	127 435 ± 14
737	mukh-002	693809	454936	425 1081	350 2048 ± 0	999 968 ± 1	651 921 ± 12	637 957 ± 2	576 954 ± 6	494 953 ± 5	204 612 ± 13	216 611 ± 17
738	mukh-003	556405	180996	661 1853	843 2048 ± 0	1360 1896 ± 3	1074 1948 ± 1	1065 2003 ± 0	1035 1981 ± 0	937 2016 ± 0	188 597 ± 13	212 604 ± 16
739	mukh-004	405118	181085	525 1353	555 2048 ± 0	509 558 ± 1	347 567 ± 1	314 569 ± 1	276 569 ± 3	237 593 ± 1	270 704 ± 1	283 703 ± 2
740	mukh-005	555239	264759	519 1346	776 2048 ± 0	384 436 ± 3	284 486 ± 6	260 495 ± 7	246 527 ± 16	241 597 ± 25	272 705 ± 1	285 706 ± 2
741	multimodality-000	0	503924	545 1417	471 2048 ± 0	363 416 ± 0	227 420 ± 0	194 423 ± 0	172 427 ± 0	154 463 ± 0	335 848 ± 25	326 800 ± 28
742	multimodality-001	185719	545045	539 1390	1145 4096 ± 0	1164 1190 ± 2	847 1169 ± 2	813 1165 ± 2	741 1167 ± 2	649 1177 ± 2	511 1424 ± 35	509 1384 ± 42
743	mvision-001	227502	149531	259 723	119 512 ± 0	709 691 ± 21	478 702 ± 19	437 697 ± 24	401 708 ± 29	324 710 ± 27	428 1123 ± 40	451 1154 ± 38
744	nazhiai-000	547484	16141	794 2716	593 2048 ± 0	691 683 ± 3	465 687 ± 2	545 835 ± 27	503 840 ± 31	423 834 ± 34	699 2230 ± 34	683 2133 ± 81
745	ncsgroup-000	95110	345861	404 1041	481 2048 ± 0	85 157 ± 0	43 153 ± 0	35 151 ± 0	30 157 ± 0	41 231 ± 0	735 2407 ± 16	737 2411 ± 22
746	ncssg-001	148743	490151	325 847	458 2048 ± 0	958 936 ± 2	674 946 ± 3	624 944 ± 2	566 938 ± 5	503 972 ± 2	891 3579 ± 50	882 3459 ± 34
747	ncssg-002	148859	415290	368 945	452 2048 ± 0	330 389 ± 1	210 397 ± 0	174 401 ± 1	162 407 ± 0	156 469 ± 0	1322 66390 ± 246	1321 66363 ± 179
748	ncssg-003	148876	414848	279 761	590 2048 ± 0	362 416 ± 1	245 437 ± 2	206 437 ± 1	182 443 ± 2	173 497 ± 1	1228 24709 ± 68	1227 24768 ± 134

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Table 37: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
749	ncssg-004	521184	483011	729 2272	416 2048 ± 0	696 687 ± 1	464 687 ± 0	447 706 ± 5	386 693 ± 1	341 731 ± 21	1229 24815 ± 117	1228 24799 ± 117
750	neosystems-001	575295	349959	-	405 2048 ± 0	1120 1137 ± 4	792 1098 ± 1	1056 1767 ± 4	1016 1769 ± 3	915 1765 ± 4	1187 18557 ± 189	1192 18640 ± 192
751	neosystems-002	599441	349942	-	849 2048 ± 0	1117 1135 ± 2	1071 1855 ± 3	1073 2258 ± 5	1048 2238 ± 3	960 2247 ± 3	1188 18752 ± 167	1191 18610 ± 213
752	neosystems-003	599442	349942	-	761 2048 ± 0	1126 1143 ± 2	1068 1836 ± 7	1074 2260 ± 3	1052 2273 ± 6	961 2273 ± 3	1193 19130 ± 223	1196 19167 ± 186
753	neosystems-004	243546	352623	172 529	495 2048 ± 0	254 324 ± 0	491 711 ± 3	534 827 ± 7	510 854 ± 2	470 916 ± 2	1151 14437 ± 176	1152 14355 ± 173
754	netbridgetech-001	133108	205875	162 508	1151 4096 ± 0	33 85 ± 1	18 83 ± 0	14 84 ± 0	14 92 ± 0	14 113 ± 4	1086 9280 ± 74	1088 9446 ± 512
755	netbridgetech-002	257687	49931	89 299	895 2048 ± 0	869 838 ± 6	591 838 ± 2	547 839 ± 1	502 839 ± 3	438 859 ± 3	813 2893 ± 65	839 3050 ± 123
756	neurotechnology-000	62129	33905	-	1337 7148 ± 0	583 611 ± 48	-	-	-	-	1339 74288 ± 2194	1334 72879 ± 2640
757	neurotechnology-001	280771	35716	-	1103 2718 ± 0	911 881 ± 46	-	-	-	-	1329 69356 ± 684	1325 69140 ± 579
758	neurotechnology-002	280771	36036	-	1104 2718 ± 0	536 581 ± 6	-	-	-	-	1325 68738 ± 748	1324 68905 ± 993
759	neurotechnology-003	339962	36125	-	1309 5214 ± 0	535 580 ± 5	-	-	-	-	1335 73589 ± 2548	1333 72837 ± 1546
760	neurotechnology-004	293384	54399	-	25 256 ± 0	344 401 ± 0	-	-	-	-	48 219 ± 8	54 231 ± 13
761	neurotechnology-005	270450	58088	-	36 256 ± 0	341 399 ± 0	-	-	-	-	53 238 ± 10	59 237 ± 7
762	neurotechnology-006	525541	54522	-	92 512 ± 0	682 678 ± 56	-	-	-	-	153 513 ± 14	163 535 ± 26
763	neurotechnology-008	119718	53462	-	34 256 ± 0	274 339 ± 0	-	-	-	-	131 467 ± 19	147 486 ± 26
764	neurotechnology-009	137515	53213	-	28 256 ± 0	329 388 ± 1	-	-	-	-	154 513 ± 10	154 512 ± 16
765	neurotechnology-010	362144	50226	-	153 514 ± 0	814 796 ± 1	556 796 ± 1	523 815 ± 3	508 853 ± 1	529 1006 ± 11	19 120 ± 8	17 115 ± 7
766	neurotechnology-011	364137	51141	-	155 514 ± 0	820 798 ± 1	561 802 ± 1	532 827 ± 3	520 873 ± 2	564 1059 ± 15	16 114 ± 11	16 114 ± 8
767	neurotechnology-012	147830	51395	-	30 256 ± 0	323 384 ± 0	199 387 ± 0	179 404 ± 1	177 435 ± 1	231 583 ± 7	18 119 ± 7	18 116 ± 7
768	neurotechnology-013	474749	85552	915 4825	154 514 ± 0	1026 1000 ± 1	730 1006 ± 2	696 1022 ± 2	652 1053 ± 2	653 1195 ± 8	14 109 ± 4	13 110 ± 4
769	neurotechnology-015	474782	86045	912 4819	156 515 ± 0	1052 1028 ± 3	750 1033 ± 3	723 1055 ± 4	680 1097 ± 4	728 1304 ± 18	21 130 ± 2	21 130 ± 4
770	neurotechnology-016	661450	89972	889 4074	158 515 ± 0	1257 1339 ± 3	974 1351 ± 2	962 1369 ± 4	911 1390 ± 4	859 1508 ± 21	29 179 ± 20	29 171 ± 20
771	neurotechnology-017	371650	98242	740 2385	33 256 ± 0	461 508 ± 2	305 513 ± 0	280 519 ± 1	248 533 ± 1	259 622 ± 15	4 80 ± 1	4 79 ± 1
772	neurotechnology-018	698669	98271	898 4367	157 515 ± 0	747 725 ± 1	519 747 ± 1	482 747 ± 4	447 769 ± 2	420 833 ± 22	6 85 ± 2	7 87 ± 7
773	neurotechnology-019	365649	103237	737 2321	35 256 ± 0	610 625 ± 1	401 625 ± 0	378 633 ± 3	378 684 ± 2	354 742 ± 17	2 71 ± 2	2 72 ± 4
774	neurotechnology-020	807529	103241	920 5010	147 513 ± 0	1171 1201 ± 4	869 1196 ± 5	838 1195 ± 8	789 1224 ± 7	772 1373 ± 22	11 102 ± 1	8 101 ± 1
775	nextmetalabs-001	361607	4729276	216 627	518 2048 ± 0	938 914 ± 0	661 928 ± 0	615 928 ± 0	572 948 ± 0	473 919 ± 0	970 4876 ± 185	962 4774 ± 72
776	nextmetalabs-002	571398	5046464	444 1123	597 2048 ± 0	1213 1259 ± 2	895 1229 ± 1	881 1253 ± 0	815 1257 ± 14	720 1296 ± 1	963 4786 ± 103	961 4753 ± 97
777	nextmetalabs-003	1105548	5046426	734 2301	393 2048 ± 0	1183 1218 ± 1	884 1217 ± 2	858 1225 ± 6	775 1207 ± 2	693 1253 ± 1	968 4874 ± 57	968 4833 ± 85
778	nhn-001	336391	817674	-	1140 4096 ± 0	1050 1027 ± 3	745 1029 ± 1	703 1029 ± 1	649 1044 ± 1	586 1090 ± 1	1308 56650 ± 260	1309 56639 ± 210
779	nhn-002	363471	817674	240 679	1223 4096 ± 0	1122 1141 ± 3	823 1138 ± 2	795 1141 ± 2	730 1151 ± 6	658 1203 ± 2	1307 56608 ± 579	1308 56549 ± 606
780	nhn-003	933665	432730	551 1427	1183 4096 ± 0	1192 1229 ± 2	918 1261 ± 1	888 1263 ± 3	834 1279 ± 2	778 1375 ± 3	1298 50560 ± 105	1299 50592 ± 142
781	nhn-004	931648	432753	813 2864	1150 4096 ± 0	587 612 ± 0	413 632 ± 0	384 636 ± 0	369 676 ± 6	405 820 ± 0	1178 17323 ± 99	1181 17334 ± 133
782	nhn-005	1278729	432776	816 2890	1187 4096 ± 0	834 811 ± 0	442 671 ± 13	395 652 ± 0	414 726 ± 12	458 890 ± 3	1182 18123 ± 400	1187 18214 ± 250
783	noblis-000	713573	253204	-	268 1061 ± 0	97 174 ± 20	-	-	-	-	488 1343 ± 45	503 1373 ± 56
784	nodeflux-000	347079	797842	-	858 2048 ± 0	495 542 ± 1	-	-	-	-	859 3283 ± 51	865 3285 ± 56
785	nodeflux-001	262553	797842	-	729 2048 ± 0	170 247 ± 1	-	-	-	-	852 3242 ± 81	864 3255 ± 93
786	nodeflux-002	774668	690213	143 466	424 2048 ± 0	728 708 ± 4	490 709 ± 4	454 716 ± 5	411 716 ± 7	345 736 ± 3	875 3475 ± 62	877 3408 ± 143
787	nominder-000	547519	102693	634 1741	46 258 ± 0	720 701 ± 0	477 701 ± 2	458 721 ± 2	413 720 ± 3	394 796 ± 1	81 314 ± 5	51 226 ± 45
788	nominder-001	332018	102774	460 1172	42 258 ± 0	114 186 ± 0	67 189 ± 1	51 188 ± 0	48 202 ± 1	56 271 ± 1	51 226 ± 1	31 172 ± 41
789	nominder-002	249049	116931	660 1852	40 258 ± 0	349 405 ± 1	228 425 ± 2	198 424 ± 1	176 434 ± 0	183 505 ± 0	10 101 ± 11	10 102 ± 14
790	nominder-003	249964	116931	745 2417	44 258 ± 0	675 675 ± 2	461 683 ± 5	417 677 ± 2	394 701 ± 3	381 775 ± 3	7 87 ± 4	5 84 ± 4
791	nominder-004	249964	114221	744 2416	43 258 ± 0	774 755 ± 2	523 751 ± 4	478 740 ± 3	446 768 ± 3	430 846 ± 1	5 81 ± 1	6 86 ± 8
792	nominder-005	289014	114221	789 2699	45 258 ± 0	1146 1170 ± 4	868 1196 ± 5	811 1161 ± 6	785 1221 ± 8	757 1343 ± 7	8 94 ± 14	20 117 ± 7

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
793	nominder-006	304867	114225	783 2660	41 258 ± 0	757 736 ± 2	517 746 ± 3	491 759 ± 3	443 762 ± 2	445 869 ± 5	13 105 ± 5	12 108 ± 10
794	notiontag-000	92753	406791	-	186 584 ± 0	500 548 ± 64	332 548 ± 35	1018 1450 ± 99	1074 3771 ± 251	1069 13146 ± 792	1282 44672 ± 269	1283 44593 ± 358
795	notiontag-001	92753	427967	225 642	187 584 ± 0	955 929 ± 35	784 1092 ± 39	1079 3709 ± 81	1079 10233 ± 180	1073 31181 ± 521	1279 43636 ± 286	1280 43724 ± 330
796	notiontag-002	271987	967207	821 2965	1079 2120 ± 0	401 453 ± 2	259 453 ± 3	220 453 ± 3	192 458 ± 2	157 471 ± 3	1202 20278 ± 194	1202 20195 ± 186
797	nsensecorp-001	187421	258593	-	869 2048 ± 0	271 336 ± 0	156 335 ± 0	125 336 ± 0	109 335 ± 0	76 337 ± 0	1287 46605 ± 93	1288 46613 ± 112
798	nsensecorp-002	187421	122407	-	435 2048 ± 0	266 333 ± 0	155 333 ± 0	127 337 ± 0	113 338 ± 0	87 351 ± 0	1285 45965 ± 213	1285 45988 ± 158
799	nsensecorp-003	199895	117041	251 710	484 2048 ± 0	653 661 ± 0	438 664 ± 0	405 662 ± 1	353 659 ± 1	284 659 ± 0	1281 44658 ± 51	1284 44654 ± 72
800	nsensecorp-004	513276	139178	615 1675	745 2048 ± 0	1317 1433 ± 0	1030 1445 ± 7	1017 1450 ± 3	977 1487 ± 5	-	732 2388 ± 42	732 2385 ± 63
801	nsensecorp-005	411845	138437	485 1240	704 2048 ± 0	1329 1455 ± 0	1036 1453 ± 0	1015 1449 ± 0	960 1457 ± 2	852 1490 ± 4	681 2131 ± 51	688 2165 ± 66
802	ntechlab-000	191530	22085	-	1105 2906 ± 1	196 278 ± 13	-	-	-	-	1249 30787 ± 142	1247 30846 ± 77
803	ntechlab-001	691296	22848	-	1335 6744 ± 1	553 587 ± 11	-	-	-	-	1323 67692 ± 833	1322 67486 ± 244
804	ntechlab-002	894169	25023	-	1336 6744 ± 1	259 330 ± 11	-	-	-	-	1343 82508 ± 213	1341 82524 ± 220
805	ntechlab-003	1422738	24649	-	1106 2906 ± 1	67 128 ± 3	-	-	-	-	1264 35327 ± 117	1267 35371 ± 123
806	ntechlab-004	3752378	115782	-	1124 3482 ± 1	843 818 ± 11	-	-	-	-	1275 38929 ± 81	1278 38916 ± 111
807	ntechlab-005	1726214	116068	-	316 1940 ± 0	731 712 ± 1	-	-	-	-	344 882 ± 42	349 880 ± 29
808	ntechlab-006	7901590	43009	-	1101 2600 ± 0	765 749 ± 1	-	-	-	-	392 1055 ± 93	341 844 ± 48
809	ntechlab-007	2509686	52474	-	1123 3348 ± 0	810 792 ± 3	-	-	-	-	454 1209 ± 59	479 1267 ± 65
810	ntechlab-008	1138002	52483	-	283 1300 ± 0	507 556 ± 1	-	-	-	-	415 1095 ± 45	406 1049 ± 51
811	ntechlab-009	1748043	43730	-	315 1940 ± 0	1108 1115 ± 2	803 1114 ± 1	776 1119 ± 1	711 1130 ± 2	657 1202 ± 4	207 614 ± 20	197 595 ± 28
812	ntechlab-010	698591	217167	-	277 1280 ± 0	1152 1177 ± 2	855 1180 ± 2	840 1197 ± 2	790 1224 ± 1	749 1326 ± 3	114 405 ± 13	122 416 ± 31
813	ntechlab-011	786933	209458	945 6867	279 1280 ± 0	1130 1148 ± 2	827 1142 ± 1	808 1159 ± 1	758 1185 ± 1	718 1290 ± 3	28 179 ± 11	32 173 ± 11
814	ntechlab-012	570796	212350	925 5450	1096 2560 ± 0	1247 1309 ± 1	962 1323 ± 1	939 1331 ± 1	886 1360 ± 1	834 1460 ± 3	45 211 ± 8	46 211 ± 7
815	omface-000	45945	844976	49 154	250 1024 ± 0	112 185 ± 1	79 206 ± 2	60 203 ± 1	42 195 ± 1	31 193 ± 1	139 481 ± 42	135 456 ± 20
816	omface-001	146370	1799745	46 145	217 1024 ± 0	124 194 ± 2	89 222 ± 2	65 209 ± 0	53 216 ± 1	42 233 ± 1	1186 18369 ± 19	1189 18366 ± 32
817	omnigarde-000	264057	32882	-	244 1024 ± 0	968 944 ± 0	628 887 ± 0	581 888 ± 1	537 892 ± 0	466 902 ± 0	774 2671 ± 35	771 2620 ± 29
818	omnigarde-001	200523	32882	144 466	111 512 ± 0	962 941 ± 0	626 883 ± 1	580 886 ± 1	536 891 ± 1	463 898 ± 0	507 1405 ± 31	507 1379 ± 26
819	omnigarde-002	368860	32882	278 760	240 1024 ± 0	1242 1303 ± 1	907 1246 ± 1	877 1249 ± 1	811 1253 ± 1	699 1261 ± 1	787 2727 ± 34	784 2686 ± 32
820	omnigarde-003	427751	35153	277 756	160 517 ± 0	671 673 ± 0	409 631 ± 1	377 633 ± 1	334 637 ± 1	279 647 ± 1	466 1259 ± 22	472 1244 ± 16
821	omnigarde-004	995019	35158	666 1873	161 517 ± 0	1170 1201 ± 1	919 1261 ± 1	846 1207 ± 1	781 1215 ± 0	676 1229 ± 0	469 1274 ± 22	470 1241 ± 26
822	omnigarde-005	1316067	35158	769 2545	168 525 ± 0	1147 1170 ± 1	842 1159 ± 0	814 1169 ± 7	762 1186 ± 1	654 1199 ± 1	539 1490 ± 40	539 1481 ± 38
823	onfido-000	273478	959781	354 914	601 2048 ± 0	409 459 ± 17	257 451 ± 15	218 451 ± 14	198 462 ± 15	180 505 ± 18	568 1617 ± 50	571 1637 ± 53
824	onfido-001	344394	1021960	802 2756	775 2048 ± 0	137 208 ± 4	80 208 ± 4	67 213 ± 4	58 223 ± 3	50 250 ± 4	342 874 ± 28	343 852 ± 20
825	onfido-002	852775	252949	385 1003	1163 4096 ± 0	1169 1199 ± 5	875 1202 ± 5	843 1203 ± 5	780 1213 ± 5	687 1250 ± 5	771 2625 ± 60	774 2628 ± 84
826	ooto-001	382081	95138	675 1923	1111 3072 ± 0	970 944 ± 0	678 953 ± 1	678 997 ± 0	579 957 ± 0	522 999 ± 0	975 4993 ± 17	977 5004 ± 50
827	openedge-000	447048	272235	535 1376	997 2056 ± 0	305 367 ± 0	217 404 ± 1	135 352 ± 1	115 350 ± 0	105 385 ± 0	1160 15122 ± 41	1162 15110 ± 48
828	openface-001	0	40111	26 100	412 2048 ± 0	78 148 ± 1	44 154 ± 0	147 365 ± 3	165 409 ± 9	253 616 ± 31	198 608 ± 14	210 604 ± 13
829	ovisionllc-001	192059	252531	417 1066	237 1024 ± 0	99 175 ± 0	54 175 ± 0	47 183 ± 0	45 196 ± 0	46 241 ± 0	811 2889 ± 38	819 2901 ± 47
830	ovisionllc-002	247778	96584	563 1478	224 1024 ± 0	186 266 ± 0	105 256 ± 0	81 250 ± 0	73 263 ± 1	64 313 ± 0	790 2763 ± 72	786 2727 ± 29
831	oz-001	303723	238311	-	1267 4125 ± 0	1128 1147 ± 3	860 1182 ± 3	896 1273 ± 4	1002 1617 ± 7	996 2890 ± 19	1354 228011 ± 5455	1353 220746 ± 5572
832	oz-002	716022	170261	-	1057 2065 ± 0	1075 1064 ± 3	848 1171 ± 3	1078 2953 ± 6	1077 7352 ± 13	1072 26658 ± 29	1350 131108 ± 1408	1350 126758 ± 913
833	oz-003	484147	519652	965 11575	983 2053 ± 0	1276 1375 ± 12	988 1388 ± 3	1057 1773 ± 16	1038 2039 ± 6	1007 3209 ± 5	1336 73905 ± 456	1335 73892 ± 444
834	oz-004	373982	1075452	957 7845	984 2053 ± 0	861 832 ± 7	614 871 ± 6	585 899 ± 10	671 1078 ± 12	892 1608 ± 10	1316 61654 ± 418	1314 61749 ± 450
835	pa-002	442564	308954	-	1359 18436 ± 0	70 132 ± 7	-	-	-	-	837 3088 ± 32	840 3051 ± 28
836	pa-003	714102	1464254	-	553 2048 ± 0	858 831 ± 31	-	-	-	-	365 962 ± 23	361 914 ± 38

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
837	palit-000	428754	144958	529 1360	1153 4096 ± 0	525 570 ± 1	356 578 ± 1	321 576 ± 3	283 583 ± 1	251 614 ± 1	697 2227 ± 16	699 2226 ± 16
838	palit-001	173886	145564	195 587	325 2048 ± 0	152 227 ± 0	91 224 ± 1	71 224 ± 1	63 229 ± 3	53 262 ± 2	437 1150 ± 16	437 1135 ± 23
839	pangiam-000	464252	24512	884 3963	830 2048 ± 0	612 627 ± 5	392 618 ± 4	356 615 ± 3	318 620 ± 3	272 639 ± 3	17 118 ± 7	15 113 ± 7
840	pangiam-001	1015455	37259	591 1569	644 2048 ± 0	1004 972 ± 1	708 982 ± 3	657 981 ± 2	604 990 ± 7	555 1052 ± 2	22 136 ± 11	22 139 ± 13
841	pangiam-002	486035	39834	480 1205	569 2048 ± 0	243 316 ± 0	143 316 ± 0	113 317 ± 0	100 319 ± 1	71 326 ± 2	15 111 ± 13	11 103 ± 2
842	papago-001	669274	52817	738 2341	854 2048 ± 0	1220 1272 ± 6	942 1296 ± 7	917 1295 ± 6	838 1281 ± 3	758 1345 ± 3	1165 15236 ± 169	1166 15184 ± 142
843	papil11-000	1146378	24895	717 2184	468 2048 ± 0	965 942 ± 3	798 1108 ± 2	844 1204 ± 6	897 1369 ± 10	938 2033 ± 35	203 612 ± 7	220 613 ± 11
844	papil11-001	1221825	38957	778 2618	570 2048 ± 0	982 951 ± 2	820 1135 ± 2	853 1220 ± 4	907 1386 ± 10	963 2292 ± 69	151 506 ± 22	156 519 ± 20
845	papil11-002	1208976	38985	767 2543	643 2048 ± 0	943 916 ± 2	786 1094 ± 2	812 1163 ± 1	851 1307 ± 4	949 2140 ± 10	166 560 ± 22	181 577 ± 22
846	papil11-003	1263123	39005	782 2657	450 2048 ± 0	1060 1038 ± 1	890 1222 ± 1	910 1293 ± 2	946 1431 ± 3	964 2298 ± 8	152 508 ± 10	153 501 ± 10
847	papsav1923-001	279210	52652	147 474	587 2048 ± 0	611 626 ± 1	405 628 ± 1	371 630 ± 1	343 648 ± 2	355 744 ± 3	288 725 ± 25	302 731 ± 28
848	papsav1923-002	491185	24727	449 1139	968 2052 ± 0	811 792 ± 1	705 978 ± 1	713 1042 ± 1	734 1158 ± 1	899 1641 ± 19	453 1209 ± 29	464 1206 ± 38
849	papsav1923-003	515576	24803	439 1113	845 2048 ± 0	816 797 ± 0	713 987 ± 1	715 1043 ± 1	751 1178 ± 1	919 1809 ± 7	348 903 ± 26	358 905 ± 34
850	paravision-004	556670	145440	-	1196 4096 ± 0	856 829 ± 2	587 834 ± 6	542 832 ± 2	496 833 ± 4	422 833 ± 2	294 737 ± 31	296 718 ± 38
851	paravision-006	542423	202234	-	1159 4096 ± 0	718 700 ± 1	482 704 ± 0	446 705 ± 0	397 704 ± 0	320 705 ± 0	83 321 ± 16	85 315 ± 14
852	paravision-008	542190	204400	540 1399	1218 4096 ± 0	714 699 ± 0	476 700 ± 0	442 701 ± 0	396 702 ± 1	317 702 ± 0	89 337 ± 17	96 330 ± 13
853	paravision-010	688291	205854	712 2150	1247 4100 ± 0	624 634 ± 0	419 635 ± 0	383 635 ± 0	330 635 ± 0	267 635 ± 1	559 1577 ± 35	564 1571 ± 32
854	paravision-011	781138	95589	748 2424	1246 4100 ± 0	881 852 ± 0	612 871 ± 1	561 858 ± 1	511 854 ± 0	448 873 ± 1	566 1608 ± 35	569 1625 ± 32
855	paravision-013	1537125	95602	907 4648	1232 4100 ± 0	1021 991 ± 9	720 993 ± 5	670 992 ± 4	618 1002 ± 5	526 1002 ± 7	532 1481 ± 26	545 1490 ± 25
856	paravision-015	1584003	164658	913 4820	1255 4100 ± 0	1272 1371 ± 12	1060 1577 ± 1	1037 1500 ± 4	953 1449 ± 1	866 1521 ± 7	513 1432 ± 11	525 1455 ± 32
857	paravision-017	1584003	164639	914 4820	1231 4100 ± 0	1237 1295 ± 11	833 1147 ± 4	807 1158 ± 8	739 1166 ± 7	624 1140 ± 12	523 1461 ± 10	529 1459 ± 16
858	paravision-018	1596372	164639	917 4909	1245 4100 ± 0	1338 1474 ± 11	1043 1472 ± 12	1031 1475 ± 11	961 1459 ± 11	867 1523 ± 16	552 1532 ± 68	552 1520 ± 40
859	paravision-020	1646513	155644	855 3487	1254 4100 ± 0	1365 2043 ± 0	1075 2043 ± 0	1066 2048 ± 0	1037 2038 ± 0	942 2100 ± 0	677 2110 ± 10	679 2110 ± 17
860	pensees-001	1619431	408932	674 1922	1348 8200 ± 0	1100 1108 ± 3	1033 1448 ± 17	1006 1439 ± 10	965 1464 ± 5	878 1546 ± 9	842 3151 ± 34	848 3143 ± 25
861	pentacomp-000	261914	192048	231 658	429 2048 ± 0	400 452 ± 1	252 444 ± 0	226 458 ± 4	190 456 ± 5	153 461 ± 3	412 1085 ± 25	418 1081 ± 38
862	pixelall-002	0	169030	-	1093 2560 ± 0	119 191 ± 1	-	-	-	-	459 1223 ± 56	467 1230 ± 47
863	pixelall-003	0	707030	-	1094 2560 ± 0	716 699 ± 8	-	-	-	-	448 1174 ± 28	438 1139 ± 68
864	pixelall-004	0	550919	-	1095 2560 ± 0	398 451 ± 11	256 449 ± 3	219 451 ± 1	193 459 ± 2	178 502 ± 4	431 1139 ± 65	460 1186 ± 31
865	pixelall-005	0	1001355	-	1306 5120 ± 0	1107 1112 ± 3	804 1115 ± 1	777 1120 ± 1	704 1124 ± 2	625 1143 ± 2	468 1259 ± 29	471 1243 ± 23
866	pixelall-006	0	746305	-	1091 2560 ± 0	1046 1024 ± 3	744 1028 ± 2	707 1033 ± 1	640 1032 ± 1	556 1054 ± 2	299 754 ± 14	298 722 ± 10
867	pixelall-007	0	444912	-	355 2048 ± 0	1049 1026 ± 4	752 1038 ± 2	751 1089 ± 2	676 1087 ± 2	611 1124 ± 2	275 708 ± 14	282 701 ± 19
868	pixelall-008	0	992249	635 1742	1346 8192 ± 0	1336 1471 ± 3	1004 1405 ± 4	993 1409 ± 4	931 1413 ± 3	811 1426 ± 4	613 1799 ± 50	622 1807 ± 48
869	pixelall-009	0	1009114	630 1732	1345 8192 ± 0	1344 1484 ± 3	998 1395 ± 3	983 1400 ± 4	912 1391 ± 3	815 1433 ± 3	626 1848 ± 13	627 1842 ± 19
870	pixelall-010	0	1469903	788 2693	1344 8192 ± 0	1134 1153 ± 3	775 1084 ± 4	763 1103 ± 4	679 1093 ± 3	605 1118 ± 4	639 1906 ± 13	639 1898 ± 29
871	pnpsecure-000	9726	146266	23 93	842 2048 ± 0	9 35 ± 0	8 42 ± 0	33 145 ± 0	164 409 ± 1	883 1565 ± 5	643 1918 ± 11	642 1916 ± 16
872	privid-001	0	76008	45 143	1364 30720 ± 0	397 450 ± 0	260 454 ± 0	236 467 ± 1	208 472 ± 1	179 504 ± 1	1176 17041 ± 74	1178 17053 ± 100
873	privid-002	0	219733	398 1031	341 2048 ± 0	1215 1261 ± 3	837 1156 ± 4	804 1155 ± 2	735 1162 ± 3	727 1302 ± 4	259 686 ± 22	266 680 ± 20
874	privid-003	0	188341	413 1062	851 2048 ± 0	1313 1430 ± 2	1028 1437 ± 6	1024 1459 ± 7	954 1451 ± 7	856 1499 ± 18	289 725 ± 7	297 720 ± 13
875	privid-004	0	992936	513 1304	604 2048 ± 0	1241 1303 ± 1	930 1282 ± 2	932 1324 ± 3	890 1363 ± 0	787 1387 ± 0	282 717 ± 29	280 699 ± 19
876	psl-000	260619	1537815	-	828 2048 ± 0	616 629 ± 11	-	-	-	-	67 280 ± 17	75 280 ± 17
877	psl-001	382035	1461947	-	1043 2056 ± 0	801 785 ± 16	-	-	-	-	73 298 ± 13	79 292 ± 14
878	psl-002	804934	1462048	-	944 2052 ± 0	919 888 ± 9	-	-	-	-	561 1590 ± 48	436 1133 ± 78
879	psl-003	1159643	1434859	-	1078 2120 ± 0	890 865 ± 3	-	-	-	-	391 1052 ± 14	392 1025 ± 51
880	psl-004	771727	1560145	-	1119 3144 ± 0	871 839 ± 3	-	-	-	-	251 680 ± 34	264 670 ± 22

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
881	psl-005	774031	1560153	-	1117 3144 ± 0	950 922 ± 37	-	-	-	-	268 703 ± 32	288 708 ± 26
882	psl-006	1211577	524525	-	1121 3144 ± 0	1319 1438 ± 6	1025 1434 ± 4	1004 1434 ± 4	947 1434 ± 5	821 1437 ± 5	70 291 ± 34	72 268 ± 25
883	psl-007	954351	524521	-	1120 3144 ± 0	1304 1408 ± 5	1015 1417 ± 3	998 1418 ± 3	935 1419 ± 2	807 1422 ± 3	61 265 ± 22	67 258 ± 17
884	psl-008	954351	524525	-	1118 3144 ± 0	1307 1412 ± 4	1013 1415 ± 3	997 1416 ± 2	933 1418 ± 2	805 1418 ± 2	59 259 ± 22	63 252 ± 22
885	psl-009	411027	411504	-	1282 4168 ± 0	1281 1382 ± 2	984 1381 ± 1	972 1383 ± 1	904 1383 ± 2	784 1385 ± 1	82 316 ± 14	78 289 ± 14
886	psl-010	411027	591157	924 5362	1281 4168 ± 0	1301 1403 ± 9	995 1393 ± 3	976 1392 ± 3	915 1395 ± 3	792 1396 ± 3	95 354 ± 53	95 329 ± 29
887	psl-011	814579	606050	919 4959	1349 8248 ± 0	1254 1324 ± 2	963 1323 ± 8	935 1326 ± 8	867 1324 ± 8	741 1322 ± 4	579 1680 ± 37	582 1688 ± 40
888	psl-012	1318147	622004	906 4535	1274 4144 ± 0	1105 1111 ± 2	808 1122 ± 2	767 1104 ± 2	698 1119 ± 1	604 1117 ± 1	175 583 ± 17	190 589 ± 17
889	psl-013	1318151	622036	903 4525	1275 4144 ± 0	1113 1119 ± 1	794 1105 ± 1	769 1110 ± 1	686 1104 ± 1	612 1126 ± 1	398 1062 ± 62	425 1098 ± 51
890	psl-014	915965	622044	905 4525	1273 4144 ± 0	1102 1109 ± 1	824 1139 ± 1	766 1104 ± 1	697 1118 ± 1	601 1114 ± 1	429 1132 ± 105	432 1114 ± 37
891	ptakuratsatu-000	0	585434	522 1347	174 538 ± 0	904 875 ± 3	608 863 ± 48	613 928 ± 9	580 958 ± 17	574 1066 ± 26	1013 5900 ± 103	1005 5687 ± 167
892	pxl-001	110116	78231	52 168	123 512 ± 0	45 101 ± 5	28 104 ± 5	54 189 ± 12	163 408 ± 27	838 1470 ± 144	1001 5598 ± 45	1001 5590 ± 68
893	pyramid-000	372608	219883	297 804	1032 2056 ± 0	540 583 ± 2	-	-	-	-	1054 7147 ± 59	1063 7586 ± 425
894	pyramid-001	1040862	143739	704 2098	699 2048 ± 0	829 809 ± 0	564 806 ± 0	524 815 ± 4	498 837 ± 0	453 881 ± 2	1133 12265 ± 48	1135 12276 ± 51
895	qazbs-000	362015	805258	400 1034	478 2048 ± 0	1244 1307 ± 1	905 1243 ± 0	876 1248 ± 9	812 1253 ± 1	704 1270 ± 0	982 5181 ± 62	982 5167 ± 93
896	qazsmartvisionai-000	560570	99515	739 2371	137 512 ± 0	710 694 ± 1	489 708 ± 7	456 717 ± 5	405 711 ± 5	336 723 ± 7	317 795 ± 29	316 781 ± 34
897	qazsmartvisionai-001	1417181	102251	822 2987	181 544 ± 0	1096 1103 ± 20	816 1129 ± 3	782 1124 ± 5	725 1145 ± 7	619 1134 ± 16	315 793 ± 29	330 804 ± 32
898	qazsmartvisionai-002	1365926	102252	818 2895	177 544 ± 0	1077 1068 ± 6	810 1125 ± 4	772 1114 ± 6	659 1066 ± 1	598 1113 ± 15	320 800 ± 31	323 798 ± 34
899	qazsmartvisionai-003	1365926	102265	817 2894	176 544 ± 0	1070 1056 ± 5	770 1078 ± 12	744 1079 ± 10	673 1078 ± 10	583 1088 ± 18	327 822 ± 28	329 803 ± 32
900	qazsmartvisionai-004	1564226	102265	840 3281	179 544 ± 0	1226 1280 ± 13	950 1310 ± 14	945 1338 ± 10	865 1323 ± 13	602 1115 ± 2	301 758 ± 38	309 758 ± 31
901	qluevision-001	173605	205230	112 376	1343 8192 ± 0	153 229 ± 1	95 230 ± 1	75 231 ± 1	64 233 ± 1	45 239 ± 1	866 3374 ± 38	871 3365 ± 41
902	qnap-000	186731	15598	-	738 2048 ± 0	748 726 ± 9	262 457 ± 1	227 458 ± 0	204 464 ± 1	163 482 ± 2	246 660 ± 25	258 654 ± 29
903	qnap-001	196210	13399	83 287	863 2048 ± 0	593 614 ± 1	388 615 ± 1	370 627 ± 1	322 623 ± 1	264 634 ± 2	240 649 ± 11	254 648 ± 14
904	qnap-002	346963	33284	343 882	782 2048 ± 0	847 821 ± 1	574 824 ± 1	531 824 ± 1	492 826 ± 1	418 832 ± 1	71 293 ± 13	76 287 ± 17
905	qnap-003	245476	61427	299 807	366 2048 ± 0	328 387 ± 0	206 393 ± 0	172 393 ± 0	150 393 ± 1	119 400 ± 2	253 683 ± 20	256 651 ± 17
906	qnap-004	371274	61422	384 1002	741 2048 ± 0	300 365 ± 0	180 365 ± 1	150 367 ± 0	131 368 ± 0	99 375 ± 3	252 681 ± 7	269 682 ± 13
907	qnap-005	977818	61429	811 2828	591 2048 ± 0	1001 969 ± 5	717 988 ± 8	667 992 ± 6	615 1000 ± 7	531 1008 ± 6	226 633 ± 1	237 632 ± 13
908	qnap-006	1244083	61533	846 3351	936 2052 ± 0	1047 1025 ± 5	757 1051 ± 6	712 1041 ± 6	654 1055 ± 8	562 1057 ± 10	260 688 ± 29	262 664 ± 10
909	quantasoft-003	370518	211354	414 1063	779 2048 ± 0	619 632 ± 2	418 634 ± 0	375 632 ± 0	326 631 ± 1	265 634 ± 0	39 201 ± 7	42 203 ± 8
910	rankone-000	0	96896	-	14 144 ± 0	30 82 ± 9	-	-	-	-	1278 39932 ± 468	1083 8722 ± 171
911	rankone-001	0	97092	-	21 208 ± 0	17 56 ± 4	-	-	-	-	1332 72754 ± 658	104 345 ± 29
912	rankone-002	0	98585	-	22 224 ± 0	24 75 ± 1	-	-	-	-	1327 69113 ± 3802	109 369 ± 26
913	rankone-003	0	93554	-	23 228 ± 0	10 37 ± 1	-	-	-	-	84 322 ± 20	90 324 ± 19
914	rankone-004	0	135727	-	13 133 ± 0	26 78 ± 1	-	-	-	-	91 340 ± 19	80 298 ± 17
915	rankone-005	0	104048	-	12 133 ± 0	23 71 ± 2	-	-	-	-	113 403 ± 10	98 337 ± 19
916	rankone-006	0	133045	-	17 165 ± 0	140 210 ± 1	-	-	-	-	123 443 ± 26	118 395 ± 22
917	rankone-007	0	136942	-	18 165 ± 0	168 245 ± 5	-	-	-	-	261 688 ± 20	206 601 ± 16
918	rankone-008	2	141234	-	16 165 ± 0	190 272 ± 3	-	-	-	-	297 750 ± 20	221 613 ± 23
919	rankone-009	0	107688	-	48 260 ± 0	105 179 ± 4	-	-	-	-	279 710 ± 32	169 552 ± 25
920	rankone-010	0	138435	-	51 261 ± 0	122 193 ± 1	-	-	-	-	68 282 ± 13	57 234 ± 16
921	rankone-011	0	179209	-	49 261 ± 0	521 567 ± 1	338 557 ± 1	313 567 ± 1	288 586 ± 1	301 682 ± 3	69 283 ± 14	48 220 ± 19
922	rankone-012	0	264182	-	54 261 ± 0	515 564 ± 3	335 554 ± 1	310 564 ± 1	287 586 ± 1	314 695 ± 1	65 273 ± 17	55 231 ± 14
923	rankone-013	0	228729	48 150	52 261 ± 0	705 690 ± 5	447 672 ± 1	451 712 ± 1	457 780 ± 1	606 1118 ± 3	98 356 ± 23	81 304 ± 23
924	rankone-014	0	243130	51 164	50 261 ± 0	722 701 ± 1	483 705 ± 0	471 732 ± 1	469 800 ± 1	599 1113 ± 1	78 306 ± 16	62 251 ± 13

Notes	
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3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 41: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE							COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
925	rankone-015	0	289078	65 190	53 261 ± 0	499 547 ± 5	326 543 ± 6	323 578 ± 2	325 629 ± 7	461 894 ± 9	40 201 ± 19	30 172 ± 16
926	realnetworks-000	99044	107893	-	1244 4100 ± 0	77 144 ± 2	-	-	-	-	745 2458 ± 26	752 2467 ± 35
927	realnetworks-001	99044	107893	-	1235 4100 ± 0	74 144 ± 2	-	-	-	-	754 2500 ± 47	739 2420 ± 34
928	realnetworks-002	95328	107088	-	313 1848 ± 0	173 250 ± 2	98 242 ± 4	93 282 ± 5	138 381 ± 10	379 774 ± 15	477 1285 ± 17	473 1247 ± 42
929	realnetworks-003	95334	104498	-	312 1848 ± 0	102 177 ± 10	-	-	-	-	547 1516 ± 29	553 1522 ± 60
930	realnetworks-004	172335	913988	-	991 2056 ± 0	261 330 ± 4	154 333 ± 3	178 402 ± 7	286 585 ± 15	793 1402 ± 51	455 1210 ± 29	463 1202 ± 17
931	realnetworks-005	172253	56755	-	1014 2056 ± 0	142 211 ± 4	78 205 ± 3	95 290 ± 6	238 515 ± 17	733 1312 ± 78	456 1213 ± 17	465 1207 ± 16
932	realnetworks-006	466225	56771	598 1596	1020 2056 ± 0	628 638 ± 4	406 630 ± 3	414 672 ± 5	400 706 ± 5	380 774 ± 5	133 469 ± 19	146 478 ± 25
933	realnetworks-007	570797	101527	835 3145	1008 2056 ± 0	1260 1348 ± 2	977 1358 ± 11	960 1363 ± 10	906 1386 ± 9	864 1517 ± 6	165 559 ± 31	165 539 ± 35
934	realnetworks-008	73346	75421	120 402	995 2056 ± 0	220 296 ± 3	130 294 ± 3	137 353 ± 4	123 361 ± 5	166 485 ± 5	159 539 ± 31	166 543 ± 29
935	realsense-001	363245	116558	686 1995	972 2052 ± 0	1359 1867 ± 0	1070 1845 ± 0	1060 1854 ± 0	1025 1875 ± 1	931 1952 ± 2	1172 16252 ± 121	1175 16305 ± 100
936	rebs-000	1375350	62664	820 2934	1134 4096 ± 0	607 623 ± 0	415 633 ± 10	369 626 ± 10	312 616 ± 1	254 617 ± 0	436 1150 ± 1	447 1150 ± 2
937	rebs-001	2038561	62673	776 2582	1237 4100 ± 0	823 802 ± 1	567 812 ± 8	537 829 ± 1	473 807 ± 2	402 811 ± 4	439 1151 ± 8	442 1145 ± 4
938	recognito-000	549308	247223	933 5903	1098 2564 ± 0	1086 1086 ± 2	789 1096 ± 1	762 1102 ± 2	723 1142 ± 3	670 1219 ± 7	34 193 ± 8	39 190 ± 16
939	recognito-001	517547	62334	874 3833	1099 2564 ± 0	1080 1072 ± 1	780 1089 ± 1	757 1095 ± 4	693 1112 ± 2	663 1205 ± 4	30 183 ± 10	34 183 ± 7
940	regula-000	262444	29384	207 610	881 2048 ± 0	1162 1187 ± 1	812 1126 ± 1	784 1129 ± 0	714 1132 ± 1	635 1159 ± 1	146 491 ± 16	151 500 ± 22
941	regula-001	256075	25980	380 987	421 2048 ± 0	1228 1284 ± 1	887 1220 ± 1	855 1222 ± 1	792 1226 ± 1	696 1255 ± 1	100 361 ± 10	102 342 ± 25
942	regula-002	355812	42119	416 1066	981 2052 ± 0	991 962 ± 0	647 918 ± 0	599 917 ± 0	558 932 ± 0	524 1000 ± 1	452 1194 ± 14	468 1233 ± 53
943	remarkai-000	240152	868276	-	848 2048 ± 0	855 829 ± 7	-	-	-	-	341 873 ± 4	339 835 ± 35
944	remarkai-001	241857	868314	262 730	959 2052 ± 0	860 831 ± 6	596 849 ± 18	724 1055 ± 25	766 1198 ± 34	865 1519 ± 38	462 1229 ± 20	331 805 ± 56
945	remarkai-002	224157	808777	-	383 2048 ± 0	981 950 ± 6	667 935 ± 4	632 953 ± 3	586 964 ± 4	577 1073 ± 4	423 1115 ± 25	410 1068 ± 54
946	remarkai-003	280516	58559	880 3909	1248 4100 ± 0	1016 986 ± 1	721 993 ± 1	668 992 ± 1	613 999 ± 3	536 1019 ± 2	312 787 ± 20	321 793 ± 22
947	rendip-000	0	437653	269 735	599 2048 ± 0	412 464 ± 2	264 458 ± 0	242 473 ± 0	217 483 ± 1	221 556 ± 4	173 576 ± 13	178 573 ± 11
948	revealmedia-005	293933	202465	282 767	1239 4100 ± 0	376 428 ± 0	231 428 ± 0	201 430 ± 0	175 433 ± 0	140 442 ± 0	661 2023 ± 38	662 2009 ± 26
949	revealmedia-006	293933	200912	272 745	948 2052 ± 0	319 381 ± 0	193 381 ± 0	163 382 ± 0	141 384 ± 0	114 394 ± 0	219 626 ± 35	205 600 ± 2
950	roc-016	0	674869	66 191	75 392 ± 0	513 562 ± 1	327 543 ± 2	306 553 ± 2	272 564 ± 2	260 626 ± 2	35 194 ± 8	27 161 ± 26
951	roc-017	0	565239	86 291	76 396 ± 0	639 651 ± 2	434 660 ± 1	415 675 ± 1	364 669 ± 2	344 736 ± 2	36 197 ± 4	33 178 ± 7
952	roc-018	0	932665	141 459	197 792 ± 0	1193 1231 ± 3	894 1227 ± 4	883 1253 ± 2	804 1243 ± 4	731 1308 ± 3	47 217 ± 10	86 316 ± 14
953	roc-019	0	944816	107 360	80 444 ± 0	1168 1196 ± 4	866 1191 ± 5	851 1218 ± 6	794 1232 ± 4	705 1272 ± 5	79 306 ± 7	68 259 ± 8
954	rokid-000	258612	396624	482 1218	1031 2056 ± 0	498 546 ± 3	324 542 ± 2	302 545 ± 1	242 522 ± 3	225 563 ± 4	874 3457 ± 62	885 3463 ± 77
955	rokid-001	641223	413733	420 1071	1054 2060 ± 0	934 911 ± 2	636 901 ± 5	586 899 ± 2	542 900 ± 3	464 901 ± 3	863 3345 ± 50	869 3346 ± 149
956	s1-001	435491	844340	-	1072 2092 ± 0	577 605 ± 24	396 623 ± 20	603 920 ± 39	995 1567 ± 92	-	512 1428 ± 34	512 1415 ± 85
957	s1-002	520163	95479	-	1313 6144 ± 0	1212 1257 ± 1	917 1260 ± 1	885 1261 ± 1	821 1262 ± 1	707 1273 ± 1	950 4513 ± 25	946 4479 ± 25
958	s1-003	145509	95446	-	1227 4096 ± 0	974 947 ± 0	688 959 ± 0	629 952 ± 0	575 952 ± 1	495 955 ± 1	895 3657 ± 19	900 3652 ± 16
959	s1-004	246514	202623	-	645 2048 ± 0	839 815 ± 0	569 818 ± 1	527 818 ± 1	484 820 ± 1	412 828 ± 1	855 3245 ± 100	851 3161 ± 88
960	s1-005	482369	95685	453 1146	521 2048 ± 0	1027 1001 ± 0	728 1002 ± 0	685 1004 ± 0	627 1008 ± 0	541 1029 ± 2	218 626 ± 74	187 589 ± 14
961	s1-006	482372	95681	452 1146	759 2048 ± 0	984 951 ± 0	685 956 ± 0	634 957 ± 0	585 962 ± 0	510 983 ± 0	264 696 ± 23	278 696 ± 29
962	s1-007	482385	59657	451 1144	358 2048 ± 0	1018 988 ± 1	690 965 ± 0	645 966 ± 0	591 972 ± 0	517 991 ± 0	238 648 ± 26	259 658 ± 25
963	s1-008	786695	102436	773 2573	692 2048 ± 0	822 800 ± 5	568 814 ± 3	528 818 ± 10	475 809 ± 8	427 841 ± 3	241 651 ± 32	253 647 ± 34
964	s1-009	1457134	102436	902 4435	899 2048 ± 0	1179 1213 ± 9	893 1224 ± 13	860 1230 ± 4	808 1251 ± 3	698 1258 ± 11	224 632 ± 13	228 622 ± 2
965	saffe-001	85973	62488	54 168	280 1280 ± 0	202 281 ± 1	-	-	-	-	471 1274 ± 19	482 1277 ± 26
966	saffe-002	260622	28285	332 855	629 2048 ± 0	842 817 ± 11	563 805 ± 15	517 809 ± 19	480 815 ± 29	403 813 ± 23	283 717 ± 7	294 714 ± 29
967	samsungsds-000	0	307431	-	365 2048 ± 0	247 316 ± 0	150 326 ± 5	120 328 ± 4	106 327 ± 1	83 343 ± 0	1218 23722 ± 295	1220 23874 ± 305
968	samsungsds-001	1189592	147444	882 3922	1133 4096 ± 0	1121 1140 ± 3	831 1145 ± 4	949 1344 ± 5	893 1366 ± 5	862 1514 ± 7	1300 51559 ± 773	1300 51721 ± 1003

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Table 42: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE							COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]					TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
969	samsungsds-002	1040732	147475	843 3321	1035 2056 ± 0	1111 1118 ± 1	851 1175 ± 12	964 1372 ± 6	866 1324 ± 2	851 1489 ± 4	1267 35803 ± 266	1270 36181 ± 674
970	samtech-000	109774	12807	-	1007 2056 ± 0	181 262 ± 2	-	-	-	-	954 4550 ± 26	952 4541 ± 28
971	samtech-001	288082	219883	203 605	986 2056 ± 0	218 294 ± 3	-	-	-	-	1065 7694 ± 59	1066 7678 ± 91
972	samtech-002	192220	474779	254 714	1040 2056 ± 0	144 212 ± 0	83 212 ± 0	68 215 ± 0	60 225 ± 0	58 285 ± 1	1164 15231 ± 50	1168 15215 ± 59
973	scanovate-001	257083	328532	-	733 2048 ± 0	530 577 ± 24	355 577 ± 21	373 632 ± 27	450 770 ± 28	797 1404 ± 32	1130 12054 ± 699	1149 13795 ± 705
974	scanovate-002	256986	457227	330 850	871 2048 ± 0	713 696 ± 32	494 713 ± 33	475 738 ± 28	454 779 ± 32	644 1172 ± 53	832 3021 ± 38	844 3120 ± 163
975	scanovate-003	135585	89469	298 805	357 2048 ± 0	544 585 ± 1	383 613 ± 12	332 591 ± 1	303 610 ± 2	302 684 ± 1	820 2926 ± 22	821 2925 ± 20
976	sdc-000	256814	481583	288 784	430 2048 ± 0	936 913 ± 14	639 906 ± 9	797 1142 ± 19	1017 1774 ± 45	1030 4719 ± 222	1256 32645 ± 93	1259 32653 ± 112
977	seamfix-001	429267	86391	94 320	762 2048 ± 0	738 718 ± 8	488 707 ± 25	626 947 ± 18	985 1521 ± 55	1024 4179 ± 226	1012 5897 ± 118	1012 5867 ± 123
978	securifai-001	120291	12456	-	1261 4104 ± 0	143 211 ± 1	82 211 ± 1	66 211 ± 1	52 211 ± 1	37 211 ± 1	580 1681 ± 29	586 1701 ± 25
979	securifai-002	198824	13496	-	260 1032 ± 0	63 123 ± 0	35 123 ± 0	28 123 ± 0	24 123 ± 0	17 123 ± 0	209 615 ± 22	201 597 ± 19
980	securifai-003	303794	13512	-	1257 4104 ± 0	502 549 ± 7	334 550 ± 7	304 549 ± 7	261 546 ± 6	213 546 ± 6	589 1714 ± 26	589 1713 ± 37
981	securifai-004	282177	12027	221 636	329 2048 ± 0	893 869 ± 1	609 867 ± 1	565 867 ± 1	518 867 ± 1	443 865 ± 1	585 1711 ± 19	588 1705 ± 29
982	securifai-005	252532	81777	169 526	579 2048 ± 0	1277 1377 ± 2	975 1355 ± 1	954 1353 ± 0	883 1357 ± 0	765 1356 ± 0	631 1873 ± 25	629 1847 ± 35
983	securifai-006	452474	81856	285 771	1178 4096 ± 0	1089 1090 ± 2	776 1086 ± 3	755 1093 ± 1	687 1104 ± 10	587 1090 ± 2	867 3376 ± 42	876 3399 ± 40
984	securifai-007	94589	88169	192 583	682 2048 ± 0	452 500 ± 0	301 506 ± 0	264 499 ± 1	228 501 ± 1	182 505 ± 1	537 1484 ± 11	541 1483 ± 13
985	securifai-008	111759	84658	252 711	831 2048 ± 0	630 641 ± 4	425 647 ± 3	408 663 ± 3	340 645 ± 3	280 649 ± 1	543 1498 ± 11	542 1487 ± 13
986	sensetime-001	531783	7203	-	951 2052 ± 0	746 725 ± 3	-	-	-	-	759 2546 ± 102	728 2371 ± 45
987	sensetime-002	531783	7203	-	940 2052 ± 0	818 797 ± 3	-	-	-	-	781 2713 ± 90	717 2301 ± 25
988	sensetime-003	787853	74950	-	978 2052 ± 0	927 908 ± 4	-	-	-	-	757 2527 ± 65	834 3004 ± 174
989	sensetime-004	954663	30733	-	257 1028 ± 0	1318 1437 ± 15	-	-	-	-	463 1239 ± 31	457 1171 ± 22
990	sensetime-005	765353	37673	-	258 1028 ± 0	1268 1361 ± 27	947 1304 ± 1	930 1319 ± 1	887 1360 ± 1	861 1514 ± 1	460 1223 ± 28	458 1184 ± 29
991	sensetime-006	765353	37673	8 33	254 1028 ± 0	1265 1352 ± 17	951 1311 ± 1	931 1323 ± 1	884 1357 ± 1	868 1523 ± 2	449 1179 ± 28	454 1157 ± 29
992	sensetime-007	765353	37533	934 5950	252 1028 ± 0	1288 1386 ± 41	961 1323 ± 2	951 1347 ± 2	894 1366 ± 2	889 1593 ± 8	522 1460 ± 29	517 1425 ± 26
993	sensetime-008	1176483	60067	930 5882	255 1028 ± 0	1342 1479 ± 31	1027 1436 ± 4	1032 1482 ± 4	986 1525 ± 5	902 1669 ± 2	476 1283 ± 51	469 1240 ± 47
994	sensetime-010	1175952	62384	941 6671	256 1028 ± 0	1150 1176 ± 36	829 1144 ± 2	803 1153 ± 9	746 1172 ± 6	677 1229 ± 7	94 351 ± 1	89 324 ± 5
995	serendipity-000	0	346443	142 462	525 2048 ± 0	923 900 ± 8	635 901 ± 3	606 922 ± 2	563 936 ± 1	512 987 ± 2	197 602 ± 1	214 607 ± 10
996	sertis-000	265572	68770	129 427	758 2048 ± 0	770 754 ± 0	529 759 ± 0	492 764 ± 0	441 760 ± 0	366 763 ± 0	540 1497 ± 29	565 1582 ± 38
997	sertis-001	292591	68831	-	620 2048 ± 0	622 634 ± 1	-	-	-	-	743 2449 ± 23	783 2685 ± 41
998	sertis-002	460790	68929	232 660	707 2048 ± 0	1160 1181 ± 1	853 1178 ± 0	826 1183 ± 0	763 1187 ± 0	672 1221 ± 0	413 1086 ± 32	414 1076 ± 31
999	sertis-003	0	451507	681 1965	602 2048 ± 0	391 441 ± 0	242 436 ± 2	230 461 ± 2	200 463 ± 1	160 473 ± 4	355 915 ± 10	363 917 ± 8
1000	seventhsense-000	369850	1561668	-	937 2052 ± 0	1208 1250 ± 3	915 1257 ± 1	887 1261 ± 1	818 1259 ± 1	706 1272 ± 2	615 1800 ± 35	613 1787 ± 32
1001	seventhsense-001	369850	3183365	303 812	975 2052 ± 0	1210 1255 ± 2	939 1294 ± 15	901 1277 ± 3	832 1275 ± 2	714 1288 ± 3	648 1936 ± 26	653 1943 ± 34
1002	seventhsense-002	452197	1567903	366 944	982 2052 ± 0	1209 1252 ± 1	925 1271 ± 1	893 1269 ± 1	828 1272 ± 1	717 1290 ± 1	682 2131 ± 45	680 2123 ± 45
1003	seventhsense-003	603091	453847	433 1090	960 2052 ± 0	1030 1003 ± 2	703 977 ± 0	536 828 ± 1	482 817 ± 1	409 826 ± 2	549 1523 ± 25	555 1530 ± 22
1004	seventhsense-005	4000865	453775	775 2581	1253 4100 ± 0	1112 1119 ± 1	807 1120 ± 1	789 1134 ± 4	712 1131 ± 2	626 1144 ± 1	795 2787 ± 28	797 2777 ± 22
1005	seventhsense-006	1444389	451757	774 2573	1234 4100 ± 0	1140 1162 ± 1	843 1161 ± 2	806 1158 ± 2	731 1156 ± 0	650 1182 ± 2	785 2724 ± 16	787 2728 ± 16
1006	shaman-000	0	120033	159 507	1165 4096 ± 0	645 653 ± 16	-	-	-	-	108 380 ± 25	114 379 ± 31
1007	shaman-001	0	174446	164 511	1192 4096 ± 0	217 294 ± 2	-	-	-	-	229 635 ± 19	130 441 ± 25
1008	shu-001	329513	62157	-	670 2048 ± 0	591 612 ± 5	-	-	-	-	770 2619 ± 19	831 2987 ± 143
1009	shu-002	731250	148309	349 890	1160 4096 ± 0	769 751 ± 2	537 769 ± 4	607 922 ± 4	944 1431 ± 9	1012 3489 ± 47	1368 2930763 ± 47355	1368 2929759 ± 39149
1010	shu-003	428774	146940	163 511	410 2048 ± 0	846 820 ± 6	580 828 ± 3	622 941 ± 9	854 1308 ± 15	1002 3045 ± 44	755 2506 ± 26	760 2512 ± 38
1011	siat-002	486842	7738	749 2434	964 2052 ± 0	534 579 ± 0	-	-	-	-	307 769 ± 13	308 750 ± 13
1012	siat-004	940063	6984	-	1249 4100 ± 0	666 670 ± 0	444 671 ± 7	432 693 ± 10	429 742 ± 10	481 935 ± 17	926 4013 ± 45	912 3782 ± 173

Notes	
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3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
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Table 43: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1013	siat-005	380936	16935	510 1299	360 2048 ± 0	346 403 ± 0	214 400 ± 0	175 401 ± 0	159 403 ± 1	131 422 ± 7	174 577 ± 13	182 580 ± 17
1014	sightropic-000	355144	205017	326 847	714 2048 ± 0	467 515 ± 0	313 524 ± 0	279 519 ± 0	239 516 ± 0	212 544 ± 0	1103 10207 ± 35	1104 10214 ± 59
1015	sightropic-001	765429	490992	918 4914	1025 2056 ± 0	1116 1134 ± 0	959 1321 ± 6	794 1140 ± 1	718 1136 ± 2	639 1162 ± 6	1203 21280 ± 192	1206 21306 ± 176
1016	sjtu-001	347115	148322	-	736 2048 ± 0	638 650 ± 2	-	-	-	-	1367 2243804 ± 12751	1367 2249915 ± 19380
1017	sjtu-002	446215	148306	-	655 2048 ± 0	864 835 ± 2	-	-	-	-	1366 2211198 ± 26052	1366 2210428 ± 21877
1018	sjtu-003	480795	148243	177 539	548 2048 ± 0	848 821 ± 2	570 820 ± 2	608 923 ± 3	768 1201 ± 3	971 2373 ± 9	557 1560 ± 20	559 1560 ± 14
1019	sjtu-004	1953267	241108	798 2741	1300 4608 ± 0	1196 1236 ± 2	881 1209 ± 2	912 1294 ± 4	990 1554 ± 5	989 2738 ± 8	835 3057 ± 14	842 3070 ± 20
1020	sjtu-005	1953267	241151	796 2734	1296 4608 ± 0	570 601 ± 1	390 617 ± 1	462 724 ± 2	709 1127 ± 3	995 2855 ± 11	815 2898 ± 4	818 2900 ± 4
1021	sjtu-006	2685387	241394	829 3071	1297 4608 ± 0	640 651 ± 1	448 672 ± 4	505 788 ± 9	593 979 ± 2	578 1074 ± 7	814 2897 ± 4	816 2896 ± 4
1022	sjtu-007	1126310	244296	804 2759	1298 4608 ± 0	940 914 ± 12	683 956 ± 12	823 1181 ± 37	1007 1707 ± 169	945 2118 ± 191	819 2903 ± 14	820 2902 ± 11
1023	sjtu-008	1451928	245324	825 2997	1299 4608 ± 0	1358 1832 ± 1	1069 1836 ± 2	1059 1835 ± 0	1022 1839 ± 1	925 1877 ± 1	955 4621 ± 10	955 4619 ± 25
1024	sktelecom-000	527132	298496	516 1321	290 1536 ± 0	1104 1110 ± 1	801 1113 ± 1	773 1114 ± 1	700 1120 ± 1	633 1155 ± 1	1237 26583 ± 128	1236 26508 ± 126
1025	smartbiometrik-001	30875	92620	15 72	140 512 ± 0	604 620 ± 7	403 625 ± 7	388 640 ± 4	416 728 ± 6	552 1047 ± 8	269 703 ± 31	289 710 ± 40
1026	smartengines-000	1711	3025	10 50	64 288 ± 0	92 168 ± 7	58 180 ± 1	50 188 ± 3	54 217 ± 3	57 275 ± 1	37 197 ± 5	28 167 ± 11
1027	smartengines-001	7095	4601	9 47	65 288 ± 0	264 333 ± 89	219 408 ± 1	193 423 ± 1	195 460 ± 2	219 553 ± 5	25 153 ± 11	23 143 ± 13
1028	smartvist-000	5959	134084	56 169	131 512 ± 0	19 59 ± 0	13 56 ± 0	7 56 ± 0	7 58 ± 0	11 90 ± 1	515 1435 ± 31	516 1422 ± 48
1029	smartvist-001	349219	25644	351 904	769 2048 ± 0	308 370 ± 0	189 374 ± 0	157 377 ± 1	169 422 ± 0	145 445 ± 0	800 2835 ± 99	806 2836 ± 80
1030	smilart-001	67339	45737	-	100 512 ± 0	154 230 ± 11	-	-	-	-	494 1371 ± 29	500 1356 ± 57
1031	smilart-002	111826	87805	78 263	235 1024 ± 0	101 176 ± 16	-	-	-	-	1189 18784 ± 136	1193 18795 ± 151
1032	smilart-003	67339	91670	67 192	91 512 ± 0	106 180 ± 12	60 181 ± 10	110 313 ± 22	361 665 ± 49	965 2299 ± 196	501 1395 ± 74	393 1027 ± 66
1033	sodec-000	836592	13142	819 2902	1174 4096 ± 0	1062 1041 ± 2	748 1032 ± 1	709 1035 ± 1	643 1037 ± 2	567 1061 ± 2	611 1794 ± 37	609 1775 ± 23
1034	sparktek-000	2050067	115114	964 9564	1144 4096 ± 0	1355 1656 ± 0	1063 1661 ± 0	1053 1671 ± 0	1003 1657 ± 0	901 1662 ± 0	147 495 ± 11	180 577 ± 32
1035	sparsh-001	0	366290	904 4525	829 2048 ± 0	685 680 ± 2	427 648 ± 1	385 638 ± 0	338 642 ± 0	328 717 ± 0	1094 9600 ± 275	1093 9601 ± 290
1036	sqisoft-001	278968	386291	245 689	1034 2056 ± 0	428 477 ± 5	973 1348 ± 18	955 1353 ± 26	873 1340 ± 14	791 1393 ± 28	319 797 ± 22	318 788 ± 22
1037	sqisoft-002	278039	386291	238 675	994 2056 ± 0	416 466 ± 8	269 466 ± 2	238 468 ± 11	197 461 ± 6	159 472 ± 4	300 758 ± 11	310 760 ± 23
1038	sqisoft-003	362737	607964	302 812	1020 2056 ± 0	629 638 ± 2	451 674 ± 7	457 718 ± 17	360 665 ± 6	333 720 ± 6	334 844 ± 11	342 844 ± 23
1039	staqu-000	879661	624676	415 1064	1161 4096 ± 0	835 813 ± 25	-	-	-	-	825 2979 ± 31	835 3007 ± 75
1040	starhybrid-001	100509	289356	323 845	706 2048 ± 0	292 358 ± 82	171 355 ± 49	159 379 ± 58	156 401 ± 79	112 393 ± 67	408 1075 ± 51	415 1078 ± 53
1041	stcon-000	408095	49619	448 1137	231 1024 ± 0	601 617 ± 1	411 632 ± 4	381 634 ± 1	341 645 ± 2	299 676 ± 6	121 437 ± 10	126 434 ± 11
1042	stcon-001	322871	64463	335 860	242 1024 ± 0	1011 980 ± 1	718 991 ± 1	675 995 ± 5	619 1003 ± 6	548 1042 ± 4	87 336 ± 14	97 334 ± 14
1043	stcon-002	1255490	62667	702 2095	1204 4096 ± 0	539 583 ± 0	350 570 ± 2	318 574 ± 2	282 582 ± 1	261 630 ± 0	432 1143 ± 2	439 1142 ± 4
1044	stcon-003	2119710	62673	876 3862	1241 4100 ± 0	852 823 ± 0	572 821 ± 1	541 831 ± 3	487 823 ± 1	426 838 ± 2	440 1151 ± 5	455 1157 ± 5
1045	stcon-004	2831397	64930	872 3781	974 2052 ± 0	1274 1375 ± 1	986 1384 ± 4	952 1348 ± 1	891 1365 ± 10	775 1375 ± 8	179 591 ± 4	188 589 ± 1
1046	stcon-005	3126319	50632	851 3424	1243 4100 ± 0	1299 1401 ± 2	1012 1415 ± 8	984 1400 ± 10	948 1435 ± 1	783 1382 ± 1	450 1181 ± 31	456 1162 ± 5
1047	stcon-006	3126319	50636	852 3426	1252 4100 ± 0	1283 1384 ± 1	1019 1426 ± 3	994 1410 ± 1	934 1419 ± 21	800 1412 ± 7	434 1148 ± 1	444 1148 ± 1
1048	stcon-007	3126319	50636	850 3413	1242 4100 ± 0	1316 1431 ± 1	1020 1427 ± 9	1039 1503 ± 8	927 1406 ± 7	842 1473 ± 1	445 1163 ± 10	459 1185 ± 32
1049	stcon-008	2124613	56551	770 2552	1250 4100 ± 0	1352 1558 ± 0	1057 1564 ± 0	1048 1560 ± 0	993 1565 ± 0	881 1561 ± 0	541 1497 ± 14	548 1505 ± 11
1050	stengg-000	361104	34674	260 724	626 2048 ± 0	828 809 ± 1	652 921 ± 2	682 1002 ± 1	466 794 ± 1	948 2130 ± 5	657 2005 ± 22	663 2011 ± 34
1051	sukshi-000	94035	688738	113 382	1366 32768 ± 0	350 407 ± 11	221 413 ± 8	268 504 ± 8	382 689 ± 11	885 1574 ± 28	1099 9817 ± 50	1098 9787 ± 62
1052	sumsub-000	1120840	252	421 1074	489 2048 ± 0	1363 1947 ± 1	1073 1947 ± 0	1063 1947 ± 1	1033 1950 ± 1	932 1958 ± 0	1328 69114 ± 201	1326 69212 ± 246
1053	suprema-000	246761	38507	-	890 2048 ± 0	788 771 ± 2	546 778 ± 1	562 864 ± 2	691 1109 ± 2	951 2150 ± 4	582 1690 ± 17	583 1688 ± 13
1054	suprema-001	373423	41460	-	732 2048 ± 0	806 788 ± 1	575 826 ± 2	595 914 ± 2	726 1146 ± 7	978 2443 ± 4	849 3212 ± 16	858 3220 ± 22
1055	suprema-002	373808	41473	631 1733	486 2048 ± 0	805 787 ± 3	586 833 ± 3	609 924 ± 4	759 1185 ± 6	980 2479 ± 3	858 3255 ± 17	863 3253 ± 14
1056	suprema-003	498231	116054	486 1244	908 2048 ± 0	1324 1448 ± 1	1014 1417 ± 4	999 1418 ± 3	938 1421 ± 4	830 1451 ± 5	693 2201 ± 10	694 2198 ± 13

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Table 44: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1057	suprema-004	1430475	116085	831 3096	1184 4096 ± 0	1341 1478 ± 2	1042 1472 ± 2	1028 1469 ± 1	970 1476 ± 1	855 1496 ± 1	848 3201 ± 14	855 3202 ± 22
1058	suprema-005	1430177	116089	830 3093	1136 4096 ± 0	812 794 ± 1	606 863 ± 1	516 808 ± 5	529 883 ± 1	414 830 ± 5	922 3950 ± 7	927 3948 ± 4
1059	supremaid-001	258193	23479	178 541	502 2048 ± 0	430 479 ± 1	280 481 ± 0	247 481 ± 0	220 490 ± 0	200 522 ± 0	271 704 ± 19	257 652 ± 19
1060	supremaid-002	256273	23899	99 334	351 2048 ± 0	437 483 ± 0	298 501 ± 0	255 488 ± 0	230 503 ± 0	227 565 ± 0	656 1990 ± 19	645 1923 ± 29
1061	surrey-cvssp-000	158030	70795	341 879	918 2048 ± 0	1123 1141 ± 3	839 1157 ± 3	805 1158 ± 4	737 1163 ± 3	685 1245 ± 3	1091 9557 ± 143	1094 9602 ± 186
1062	surrey-cvssp-001	900280	76392	621 1705	439 2048 ± 0	1186 1221 ± 1	902 1238 ± 2	868 1240 ± 0	806 1243 ± 0	697 1257 ± 0	1192 18970 ± 161	1195 18999 ± 176
1063	surrey-cvssp-002	903493	87776	625 1720	345 2048 ± 0	1180 1213 ± 1	882 1211 ± 1	902 1279 ± 0	839 1282 ± 0	725 1300 ± 0	1101 9906 ± 120	1101 9911 ± 167
1064	surrey-cvssp-003	1013099	109557	723 2208	559 2048 ± 0	807 789 ± 1	594 846 ± 1	559 854 ± 1	796 1234 ± 2	1008 3283 ± 3	1058 7358 ± 130	1056 7336 ± 93
1065	surrey-cvssp-004	1142444	108961	722 2203	619 2048 ± 0	763 747 ± 1	1058 1568 ± 2	1082 4350 ± 12	1081 11245 ± 7	-	1067 7794 ± 109	1067 7738 ± 118
1066	swsam-001	265887	95072	224 642	511 2048 ± 0	1071 1058 ± 34	771 1079 ± 31	752 1091 ± 35	668 1076 ± 9	596 1109 ± 45	817 2902 ± 31	815 2892 ± 32
1067	synesis-000	340264	76158	-	112 512 ± 0	56 117 ± 0	-	-	-	-	309 775 ± 206	177 568 ± 48
1068	synesis-001	340264	78195	-	130 512 ± 0	60 122 ± 0	-	-	-	-	332 828 ± 182	279 698 ± 44
1069	synesis-003	256748	155901	-	1182 4096 ± 0	34 90 ± 0	-	-	-	-	1053 7118 ± 121	1052 7162 ± 100
1070	synesis-004	270628	16252	-	909 2048 ± 0	755 735 ± 15	-	-	-	-	116 424 ± 14	124 430 ± 22
1071	synesis-005	146509	17726	-	576 2048 ± 0	141 211 ± 9	-	-	-	-	191 599 ± 23	183 581 ± 32
1072	synesis-006	731941	21817	562 1472	1256 4104 ± 0	501 549 ± 1	330 546 ± 1	305 552 ± 1	269 558 ± 2	271 639 ± 28	265 697 ± 32	274 688 ± 31
1073	synesis-007	1442961	24145	752 2443	1115 3080 ± 0	1181 1215 ± 5	923 1268 ± 30	921 1306 ± 67	853 1311 ± 58	808 1423 ± 52	256 684 ± 32	272 686 ± 25
1074	synology-000	221021	25809	138 453	528 2048 ± 0	351 407 ± 14	222 415 ± 14	434 694 ± 31	916 1396 ± 58	1026 4568 ± 211	1196 19720 ± 203	1198 19767 ± 379
1075	synology-001	256895	25804	-	400 2048 ± 0	966 942 ± 21	-	-	-	-	506 1402 ± 29	599 1730 ± 220
1076	synology-002	256713	25943	152 488	674 2048 ± 0	918 886 ± 4	630 892 ± 3	604 920 ± 2	616 1000 ± 5	738 1317 ± 12	525 1466 ± 32	546 1496 ± 45
1077	syscake-000	50022	12609	61 184	10 128 ± 0	164 243 ± 1	99 245 ± 0	79 241 ± 1	75 269 ± 0	89 357 ± 1	31 185 ± 1	35 185 ± 1
1078	szpu-000	283522	15225	784 2660	499 2048 ± 0	117 190 ± 1	72 192 ± 1	84 259 ± 6	178 438 ± 11	661 1204 ± 32	927 4026 ± 57	932 4021 ± 56
1079	sztu-000	338637	15871	509 1298	364 2048 ± 0	479 531 ± 0	317 532 ± 0	289 533 ± 0	252 537 ± 0	216 548 ± 0	177 585 ± 11	193 592 ± 13
1080	sztu-001	338650	15871	511 1299	531 2048 ± 0	487 535 ± 0	321 537 ± 0	294 538 ± 0	253 540 ± 0	217 553 ± 0	192 599 ± 10	202 598 ± 10
1081	t4isb-000	234227	115237	103 345	496 2048 ± 0	1032 1006 ± 5	726 1001 ± 1	688 1006 ± 1	629 1009 ± 1	538 1022 ± 2	892 3586 ± 34	893 3534 ± 34
1082	tahakom-001	198869	724103	190 581	757 2048 ± 0	227 302 ± 2	120 277 ± 3	146 364 ± 7	130 368 ± 4	110 389 ± 4	731 2387 ± 28	731 2381 ± 22
1083	taiwanmobile-001	170523	1947147	187 570	1092 2560 ± 0	533 579 ± 8	543 775 ± 16	422 683 ± 4	412 718 ± 8	385 781 ± 6	1273 38086 ± 62	1275 38109 ± 66
1084	taiwanmobile-002	170523	1969728	87 295	522 2048 ± 0	84 156 ± 0	46 162 ± 0	90 281 ± 0	263 549 ± 3	934 1978 ± 21	1305 55746 ± 469	1303 55598 ± 410
1085	tcv-001	171624	816225	108 363	354 2048 ± 0	42 98 ± 0	23 98 ± 0	20 99 ± 0	17 100 ± 0	16 122 ± 0	405 1070 ± 31	401 1045 ± 17
1086	tech5-000	1451185	470097	-	225 1024 ± 0	448 498 ± 4	-	-	-	-	305 763 ± 23	313 766 ± 28
1087	tech5-001	636346	470101	-	1142 4096 ± 0	471 522 ± 5	-	-	-	-	414 1087 ± 34	324 799 ± 44
1088	tech5-002	1150887	111744	-	278 1280 ± 0	794 780 ± 10	-	-	-	-	508 1406 ± 120	403 1048 ± 57
1089	tech5-003	1427464	118901	-	289 1536 ± 0	914 885 ± 20	-	-	-	-	438 1151 ± 37	434 1128 ± 32
1090	tech5-004	2410272	118858	-	69 321 ± 0	900 872 ± 2	805 1117 ± 164	774 1114 ± 182	716 1134 ± 179	521 999 ± 44	185 597 ± 13	192 592 ± 16
1091	tech5-005	1178769	120517	549 1426	106 512 ± 0	1221 1272 ± 109	755 1038 ± 63	718 1046 ± 39	703 1124 ± 38	762 1351 ± 44	765 2573 ± 37	766 2545 ± 32
1092	tech5-007	0	340324	781 2647	104 512 ± 0	1267 1360 ± 0	979 1366 ± 0	967 1376 ± 0	900 1373 ± 0	822 1438 ± 6	158 538 ± 19	155 516 ± 22
1093	tech5-008	0	365877	928 5567	454 2048 ± 0	649 655 ± 3	399 624 ± 11	365 625 ± 11	327 631 ± 11	323 710 ± 12	1059 7371 ± 81	1057 7367 ± 99
1094	tech5-009	0	361983	757 2453	348 2048 ± 0	1054 1029 ± 25	716 988 ± 21	702 1028 ± 23	624 1006 ± 20	597 1111 ± 22	1063 7478 ± 131	1062 7464 ± 120
1095	techainer-001	198738	703687	685 1977	477 2048 ± 0	320 381 ± 9	204 391 ± 5	177 402 ± 5	147 391 ± 1	152 461 ± 5	1112 10726 ± 189	1113 10714 ± 243
1096	techainer-002	286340	1013105	506 1293	1173 4096 ± 0	373 427 ± 2	233 429 ± 4	197 424 ± 1	179 438 ± 11	184 506 ± 6	527 1472 ± 10	531 1462 ± 16
1097	techbiometricid-001	172553	886937	128 427	330 2048 ± 0	147 218 ± 8	93 226 ± 6	224 455 ± 19	637 1023 ± 36	1014 3669 ± 176	1313 59682 ± 512	1313 61123 ± 662
1098	techsign-000	0	1101622	683 1969	802 2048 ± 0	303 366 ± 1	212 398 ± 1	816 1172 ± 3	1070 3065 ± 18	1066 10460 ± 65	960 4758 ± 112	964 4789 ± 93
1099	techsign-001	0	586983	668 1881	625 2048 ± 0	790 772 ± 35	549 788 ± 23	514 802 ± 42	574 949 ± 10	798 1409 ± 26	181 592 ± 11	195 592 ± 13
1100	telexper-000	266638	74277	215 625	822 2048 ± 0	545 586 ± 1	353 576 ± 0	334 592 ± 1	336 639 ± 0	455 886 ± 0	999 5559 ± 54	997 5553 ± 47

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1101	tevian-000	455746	16296	-	[588]2048 ± 0	[163]242 ± 14	-	-	-	-	[118]430 ± 38	[123]427 ± 23
1102	tevian-001	682319	16344	-	[766]2048 ± 0	[169]245 ± 13	-	-	-	-	[92]350 ± 22	[93]327 ± 13
1103	tevian-002	724437	16352	-	[925]2049 ± 0	[222]298 ± 15	-	-	-	-	[104]369 ± 16	[117]386 ± 25
1104	tevian-003	791725	16348	-	[933]2049 ± 0	[348]404 ± 15	-	-	-	-	[93]350 ± 11	[100]338 ± 25
1105	tevian-004	863474	16544	-	[374]2048 ± 0	[458]506 ± 30	-	-	-	-	[135]474 ± 31	[91]326 ± 20
1106	tevian-005	921043	16556	-	[386]2048 ± 0	[620]633 ± 21	[445]672 ± 25	[529]818 ± 37	[695]1117 ± 64	[969]2364 ± 121	[171]568 ± 22	[215]607 ± 35
1107	tevian-006	692492	19339	-	[735]2048 ± 0	[585]611 ± 1	[439]666 ± 41	[403]661 ± 32	[366]672 ± 37	[338]723 ± 31	[178]591 ± 19	[179]573 ± 28
1108	tevian-007	779934	19523	[623]1712	[261]1032 ± 0	[541]583 ± 1	[357]579 ± 0	[325]580 ± 0	[289]588 ± 1	[268]636 ± 0	[971]4894 ± 65	[970]4841 ± 83
1109	tevian-008	847177	19519	[861]3610	[259]1032 ± 0	[913]884 ± 2	[638]903 ± 1	[589]903 ± 1	[546]911 ± 1	[488]946 ± 1	[966]4828 ± 40	[967]4811 ± 41
1110	tiger-001	171041	102515	-	[1354]8632 ± 0	[239]312 ± 12	-	-	-	-	[1346]98339 ± 34	[1346]98327 ± 32
1111	tiger-002	341638	178194	-	[1041]2056 ± 0	[335]393 ± 20	-	-	-	-	[683]2135 ± 29	[685]2137 ± 38
1112	tiger-003	426164	560292	-	[1023]2056 ± 0	[407]458 ± 21	-	-	-	-	[662]2031 ± 35	[665]2029 ± 38
1113	tiger-004	342866	253683	-	[979]2052 ± 0	[819]798 ± 2	-	-	-	-	[183]595 ± 5	[204]598 ± 7
1114	tiger-005	342866	253734	[575]1532	[969]2052 ± 0	[1091]1097 ± 2	[766]1065 ± 2	[738]1066 ± 2	[660]1067 ± 3	[582]1088 ± 3	[212]620 ± 19	[225]615 ± 16
1115	tiger-006	421186	394688	[253]714	[973]2052 ± 0	[1291]1392 ± 16	[1010]1411 ± 10	[1011]1444 ± 10	[988]1531 ± 11	[922]1848 ± 10	[620]1810 ± 20	[621]1801 ± 13
1116	tiger-007	516470	192057	[233]661	[966]2052 ± 0	[404]455 ± 1	[268]464 ± 2	[233]464 ± 3	[209]472 ± 4	[208]537 ± 1	[387]1033 ± 8	[398]1037 ± 19
1117	tinkoff-001	274660	389272	[211]616	[660]2048 ± 0	[1151]1176 ± 3	[854]1179 ± 3	[821]1178 ± 3	[744]1169 ± 2	[660]1203 ± 3	[942]4361 ± 74	[941]4364 ± 75
1118	tngd-001	73167	519258	[185]560	[958]2052 ± 0	[100]175 ± 0	[68]190 ± 0	[180]404 ± 0	[194]460 ± 1	[133]432 ± 0	[708]2274 ± 29	[707]2265 ± 20
1119	tnitech-000	234032	13976	[926]5471	[320]2048 ± 0	[360]415 ± 1	[230]427 ± 1	[192]419 ± 4	[171]427 ± 3	[135]436 ± 2	[739]2438 ± 14	[742]2436 ± 19
1120	tongyi-004	947322	138901	-	[1082]2167 ± 0	[81]153 ± 0	-	-	-	-	[1190]18916 ± 120	[1194]18909 ± 126
1121	tongyi-005	1140701	138919	[706]2121	[1071]2089 ± 0	[89]165 ± 1	-	-	-	-	[1191]18924 ± 65	[1200]20158 ± 103
1122	tongyitrans-001	625339	75069	-	[1049]2058 ± 0	[237]310 ± 20	-	-	-	-	[1179]17769 ± 74	[1182]17750 ± 63
1123	tongyitrans-002	625336	75081	-	[1050]2058 ± 0	[287]356 ± 35	-	-	-	-	[1243]29816 ± 281	[1183]17799 ± 127
1124	tongyitrans-003	1769974	138883	-	[1295]4386 ± 0	[419]468 ± 0	-	-	-	-	[1317]61793 ± 154	[1272]37122 ± 155
1125	toppanidgate-000	671181	711850	[649]1798	[1208]4096 ± 0	[942]915 ± 1	[644]916 ± 1	[598]916 ± 1	[548]917 ± 1	[471]917 ± 1	[1232]25262 ± 84	[1230]25264 ± 97
1126	toshiba-000	3893310	235400	-	[311]1812 ± 0	[473]528 ± 3	-	-	-	-	[702]2255 ± 60	[702]2251 ± 53
1127	toshiba-001	3893310	235400	-	[1100]2580 ± 0	[598]615 ± 3	-	-	-	-	[816]2900 ± 80	[814]2881 ± 60
1128	toshiba-002	813606	114260	-	[302]1560 ± 0	[492]541 ± 0	-	-	-	-	[884]3521 ± 369	[745]2449 ± 124
1129	toshiba-003	984125	114264	-	[303]1560 ± 0	[491]540 ± 0	-	-	-	-	[733]2390 ± 41	[736]2407 ± 81
1130	toshiba-004	599297	27880	[597]1596	[1027]2056 ± 0	[1323]1447 ± 3	[1035]1453 ± 2	[1022]1457 ± 9	[959]1457 ± 3	[846]1479 ± 4	[382]1020 ± 25	[381]998 ± 32
1131	toshiba-005	599298	61113	-	[1001]2056 ± 0	[1330]1456 ± 4	[1037]1454 ± 2	[1025]1461 ± 2	[955]1455 ± 2	[833]1459 ± 2	[567]1613 ± 34	[567]1607 ± 28
1132	toshiba-006	599566	44078	[595]1588	[1002]2056 ± 0	[1343]1481 ± 16	[1053]1515 ± 7	[1040]1506 ± 6	[984]1521 ± 2	[879]1546 ± 30	[383]1022 ± 17	[391]1022 ± 23
1133	toshiba-007	547545	76675	[508]1297	[1030]2056 ± 0	[743]722 ± 1	[548]784 ± 0	[502]777 ± 4	[445]766 ± 2	[419]832 ± 15	[277]709 ± 22	[292]712 ± 26
1134	toshiba-008	707290	76687	[647]1791	[1009]2056 ± 0	[1010]979 ± 1	[702]976 ± 0	[662]986 ± 3	[622]1005 ± 2	[559]1056 ± 14	[247]674 ± 68	[271]683 ± 71
1135	toshiba-009	651747	76688	[605]1639	[1039]2056 ± 0	[947]921 ± 1	[666]933 ± 1	[601]919 ± 2	[561]935 ± 3	[520]996 ± 21	[284]719 ± 48	[281]700 ± 31
1136	toshiba-010	1091350	76688	[793]2710	[992]2056 ± 0	[1293]1393 ± 2	[1062]1638 ± 15	[1023]1457 ± 1	[941]1426 ± 14	[841]1473 ± 19	[196]601 ± 25	[211]604 ± 23
1137	toshiba-011	1106463	76900	[795]2733	[1003]2056 ± 0	[1278]1379 ± 1	[1007]1406 ± 1	[990]1407 ± 1	[898]1370 ± 1	[829]1448 ± 18	[276]708 ± 56	[250]641 ± 37
1138	toshiba-012	1151623	85416	[727]2253	[1028]2056 ± 0	[1364]2020 ± 0	[1076]2048 ± 0	[1067]2049 ± 0	[1039]2073 ± 4	[947]2125 ± 5	[475]1281 ± 17	[492]1315 ± 40
1139	toss-000	993640	94527	[891]4182	[378]2048 ± 0	[1053]1028 ± 0	[873]1200 ± 3	[874]1246 ± 7	[694]1116 ± 2	[576]1072 ± 0	[352]909 ± 78	[362]914 ± 60
1140	touchlessid-000	92561	64467	[100]341	[577]2048 ± 0	[236]309 ± 5	[138]305 ± 2	[109]312 ± 5	[78]277 ± 4	[86]349 ± 17	[1254]31935 ± 292	[1255]31958 ± 243
1141	touchlessid-001	255274	14355	[176]538	[754]2048 ± 0	[277]344 ± 1	[165]347 ± 1	[188]414 ± 3	[296]595 ± 10	[911]1732 ± 61	[619]1806 ± 35	[620]1800 ± 35
1142	touchlessid-002	255586	14284	[110]367	[639]2048 ± 0	[309]371 ± 1	[190]375 ± 1	[208]438 ± 3	[337]640 ± 10	[880]1548 ± 57	[642]1915 ± 41	[633]1871 ± 38
1143	touchlessid-003	271397	14226	[165]512	[756]2048 ± 0	[356]410 ± 0	[226]419 ± 0	[200]429 ± 0	[216]479 ± 1	[303]685 ± 6	[199]608 ± 17	[200]596 ± 1
1144	touchlessid-004	386383	14727	[223]642	[392]2048 ± 0	[884]854 ± 0	[664]932 ± 2	[872]1244 ± 6	[1036]2001 ± 2	[1033]5013 ± 7	[550]1527 ± 28	[547]1501 ± 14

Notes	
1	The configuration size does not capture static data included in libraries.
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3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 46: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1145	transmitsecurity-001	1786905	2031398	531 1363	1320 6144 ± 0	275 342 ± 13	161 344 ± 15	123 332 ± 22	96 312 ± 15	96 370 ± 19	1098 9692 ± 23	1099 9847 ± 34
1146	trueface-000	255123	796861	-	836 2048 ± 0	304 367 ± 8	-	-	-	-	140 482 ± 13	160 528 ± 20
1147	trueface-001	255123	186754	-	85 500 ± 0	333 390 ± 1	-	-	-	-	248 676 ± 26	170 558 ± 50
1148	trueface-002	253947	123116	151 486	319 2000 ± 0	295 360 ± 0	175 361 ± 0	195 423 ± 0	293 590 ± 1	-	33 192 ± 14	37 186 ± 19
1149	trueface-003	346530	24308	881 3916	796 2048 ± 0	1099 1107 ± 22	456 677 ± 3	469 732 ± 7	544 905 ± 5	-	12 103 ± 11	14 112 ± 29
1150	trueidvng-001	766071	37721	645 1781	1312 6144 ± 0	1006 975 ± 1	711 985 ± 1	666 989 ± 1	633 1016 ± 1	616 1128 ± 2	1269 37129 ± 216	1332 72067 ± 305
1151	truststamp-001	1795742	275073	573 1524	193 768 ± 0	123 194 ± 0	70 191 ± 0	49 187 ± 0	51 210 ± 1	77 338 ± 8	1077 8415 ± 66	1079 8392 ± 71
1152	truststamp-002	1060439	10841	695 2066	852 2048 ± 0	224 300 ± 0	152 330 ± 1	116 325 ± 0	110 335 ± 2	146 452 ± 0	1117 11281 ± 179	1119 11273 ± 203
1153	truststamp-003	1206119	10474	667 1875	646 2048 ± 0	394 445 ± 0	253 445 ± 0	217 449 ± 0	199 462 ± 1	210 539 ± 2	1157 14901 ± 619	1159 14813 ± 472
1154	ttigroup-000	466606	454674	736 2320	778 2048 ± 0	932 909 ± 2	658 925 ± 8	583 897 ± 1	545 909 ± 3	475 923 ± 2	729 2382 ± 17	734 2387 ± 23
1155	tuputech-000	11476	17185	7 33	652 2048 ± 0	61 122 ± 4	33 120 ± 1	31 142 ± 2	44 196 ± 5	125 411 ± 14	1220 23893 ± 406	1231 25279 ± 406
1156	turingtechvip-001	399874	54535	210 615	640 2048 ± 0	1285 1384 ± 4	992 1391 ± 1	979 1393 ± 1	930 1411 ± 1	845 1476 ± 2	596 1733 ± 19	602 1734 ± 20
1157	turingtechvip-002	167556	140995	339 877	463 2048 ± 0	1348 1493 ± 2	949 1306 ± 1	971 1382 ± 1	872 1337 ± 1	812 1426 ± 3	1147 13819 ± 103	1150 13807 ± 137
1158	turkcell-000	271083	133553	222 636	816 2048 ± 0	1103 1110 ± 1	787 1094 ± 0	764 1103 ± 0	708 1126 ± 1	655 1201 ± 1	809 2866 ± 23	813 2873 ± 40
1159	turkcell-001	287616	133870	230 657	691 2048 ± 0	690 682 ± 0	471 695 ± 0	428 688 ± 1	384 692 ± 0	319 702 ± 0	941 4342 ± 71	939 4310 ± 72
1160	turkcell-002	542178	139150	219 633	373 2048 ± 0	809 791 ± 1	340 559 ± 1	508 793 ± 3	465 793 ± 2	229 574 ± 0	856 3249 ± 65	859 3231 ± 53
1161	twface-000	661735	11782	809 2796	543 2048 ± 0	895 871 ± 1	616 873 ± 1	570 873 ± 2	523 876 ± 2	462 898 ± 1	544 1504 ± 29	549 1510 ± 34
1162	twface-001	671511	11782	812 2851	680 2048 ± 0	952 923 ± 1	657 925 ± 2	612 926 ± 1	556 929 ± 2	484 940 ± 2	504 1400 ± 32	510 1402 ± 37
1163	ulsee-001	370519	57261	-	824 2048 ± 0	646 654 ± 2	-	-	-	-	1019 6065 ± 94	1024 6228 ± 77
1164	ultinous-000	90803	503529	-	1236 4100 ± 0	16 53 ± 0	-	-	-	-	939 4263 ± 50	938 4262 ± 42
1165	ultinous-001	403572	501651	-	1357 12304 ± 0	132 200 ± 0	-	-	-	-	1268 36357 ± 223	1271 36332 ± 210
1166	uluface-002	0	480761	431 1088	678 2048 ± 0	901 873 ± 42	599 855 ± 9	653 978 ± 24	826 1271 ± 40	967 2333 ± 68	1194 19207 ± 1114	1190 18501 ± 274
1167	uluface-003	97357	529422	493 1264	1108 3072 ± 0	995 965 ± 11	692 968 ± 10	748 1087 ± 20	908 1387 ± 36	979 2469 ± 86	1233 26057 ± 195	1239 26865 ± 566
1168	unicc-001	24840	5123261	659 1849	347 2048 ± 0	246 316 ± 4	167 349 ± 4	546 838 ± 14	684 1102 ± 11	735 1312 ± 15	823 2950 ± 29	822 2929 ± 26
1169	unicc-002	277015	1705310	614 1673	344 2048 ± 0	580 609 ± 1	393 620 ± 1	350 612 ± 0	356 660 ± 2	368 763 ± 3	712 2289 ± 13	712 2295 ± 22
1170	unicc-003	361274	1737967	651 1806	498 2048 ± 0	1258 1343 ± 3	964 1328 ± 1	950 1345 ± 1	892 1366 ± 1	849 1484 ± 6	723 2339 ± 74	723 2327 ± 29
1171	unicc-004	361274	1737981	648 1793	387 2048 ± 0	1262 1348 ± 2	969 1334 ± 1	956 1355 ± 1	917 1397 ± 1	893 1613 ± 4	717 2306 ± 13	718 2304 ± 16
1172	unissey-001	0	1956593	361 934	1228 4096 ± 0	910 880 ± 3	631 892 ± 3	1019 1452 ± 8	1069 3048 ± 12	1061 10017 ± 387	524 1463 ± 35	534 1471 ± 34
1173	unissey-002	0	1443765	281 765	1132 4096 ± 0	758 736 ± 1	525 752 ± 1	674 994 ± 1	942 1426 ± 1	1010 3331 ± 2	1134 12308 ± 91	1136 12302 ± 137
1174	unissey-003	0	814526	226 650	1191 4096 ± 0	737 718 ± 1	516 744 ± 0	633 956 ± 1	925 1403 ± 1	1003 3055 ± 2	563 1594 ± 20	563 1570 ± 44
1175	unissey-004	1	1065839	397 1030	1214 4096 ± 0	284 354 ± 2	182 366 ± 0	189 416 ± 0	166 417 ± 0	122 409 ± 0	938 4261 ± 124	953 4557 ± 480
1176	unissey-005	0	1125043	408 1050	1152 4096 ± 0	283 352 ± 0	185 369 ± 0	176 402 ± 0	154 397 ± 0	121 408 ± 0	956 4630 ± 97	974 4964 ± 161
1177	unissey-006	0	1315567	471 1188	1149 4096 ± 0	937 914 ± 0	663 930 ± 0	714 1043 ± 0	648 1044 ± 1	554 1048 ± 0	1025 6189 ± 111	1033 6605 ± 186
1178	upc-001	0	89914	423 1077	267 1052 ± 0	504 551 ± 15	481 703 ± 56	460 724 ± 51	435 751 ± 49	441 863 ± 33	838 3114 ± 44	852 3165 ± 97
1179	urielsoft-000	256261	67932	909 4700	333 2048 ± 0	127 197 ± 0	92 226 ± 0	92 281 ± 2	85 289 ± 2	202 528 ± 2	222 631 ± 10	233 630 ± 2
1180	useb-000	1002886	493465	559 1437	568 2048 ± 0	592 613 ± 2	377 605 ± 1	358 621 ± 2	347 653 ± 2	431 848 ± 3	685 2153 ± 45	697 2222 ± 115
1181	useb-001	1000960	493816	554 1429	440 2048 ± 0	670 673 ± 4	354 577 ± 4	324 579 ± 8	297 596 ± 9	374 768 ± 2	698 2230 ± 65	714 2299 ± 90
1182	useb-002	1000967	493456	548 1423	338 2048 ± 0	482 532 ± 2	545 778 ± 2	397 657 ± 4	351 657 ± 2	428 843 ± 3	722 2336 ± 47	721 2323 ± 60
1183	useb-003	1001019	493456	567 1484	850 2048 ± 0	463 512 ± 2	310 521 ± 3	287 528 ± 12	265 550 ± 2	337 723 ± 2	688 2172 ± 38	691 2175 ± 75
1184	useb-004	2086479	454237	806 2765	571 2048 ± 0	1271 1369 ± 2	1021 1428 ± 12	1003 1428 ± 5	991 1557 ± 10	929 1945 ± 4	716 2303 ± 54	725 2350 ± 94
1185	uxlabs-001	291127	39378	247 700	1129 4096 ± 0	338 395 ± 0	198 387 ± 0	167 388 ± 0	145 390 ± 0	117 396 ± 0	629 1863 ± 31	644 1921 ± 45
1186	uxlabs-003	1051837	37767	604 1638	1127 4096 ± 0	1290 1390 ± 1	1009 1410 ± 5	975 1391 ± 3	922 1402 ± 6	818 1435 ± 1	574 1645 ± 10	573 1641 ± 37
1187	uzinfocom-000	271124	508385	346 885	1063 2078 ± 0	103 178 ± 0	57 180 ± 0	57 191 ± 0	49 208 ± 12	70 325 ± 0	399 1064 ± 41	409 1055 ± 26
1188	vaidio-001	461288	112836	418 1068	642 2048 ± 0	600 616 ± 0	394 621 ± 0	360 622 ± 0	323 623 ± 0	308 690 ± 0	1306 56447 ± 44	1307 56451 ± 63

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Table 47: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1189	vcog-002	3229434	118946	867 3666	1368 61504 ± 5	290 357 ± 25	-	-	-	-	1358 296154 ± 3077	1358 296436 ± 4183
1190	vcortex-001	105305	55240	157 502	200 896 ± 0	133 201 ± 2	74 197 ± 0	64 209 ± 3	68 244 ± 6	98 371 ± 19	66 279 ± 4	74 277 ± 4
1191	vd-000	213686	12962	-	253 1028 ± 0	72 134 ± 3	-	-	-	-	526 1467 ± 19	527 1456 ± 16
1192	vd-001	170262	44058	-	965 2052 ± 0	245 316 ± 6	-	-	-	-	465 1258 ± 38	446 1148 ± 109
1193	vd-002	254498	34389	6 31	159 516 ± 0	694 684 ± 5	457 679 ± 4	416 676 ± 5	385 693 ± 5	358 754 ± 5	76 300 ± 14	87 319 ± 32
1194	vd-003	254505	44051	3 29	956 2052 ± 0	706 691 ± 5	469 690 ± 5	423 683 ± 4	383 691 ± 5	334 722 ± 5	378 1003 ± 11	385 1001 ± 7
1195	veridas-001	196540	190018	-	491 2048 ± 0	667 671 ± 21	-	-	-	-	1006 5748 ± 20	1049 7111 ± 148
1196	veridas-002	193466	190018	-	125 512 ± 0	665 669 ± 20	-	-	-	-	595 1733 ± 81	651 1934 ± 44
1197	veridas-003	293109	141587	-	359 2048 ± 0	920 890 ± 33	-	-	-	-	991 5484 ± 42	1055 7306 ± 410
1198	veridas-004	196585	160684	-	561 2048 ± 0	681 678 ± 22	520 749 ± 27	1029 1470 ± 52	1072 3228 ± 95	1063 10349 ± 273	995 5516 ± 42	1059 7425 ± 130
1199	veridas-005	196585	269478	-	906 2048 ± 0	578 606 ± 12	-	-	-	-	1310 56976 ± 200	1320 66298 ± 216
1200	veridas-006	355669	896424	-	892 2048 ± 0	909 880 ± 8	627 885 ± 8	895 1271 ± 18	1050 2242 ± 38	1046 6414 ± 156	1309 56940 ± 149	1319 66077 ± 194
1201	veridas-007	355105	891492	765 2522	607 2048 ± 0	899 872 ± 9	617 875 ± 8	886 1261 ± 18	1049 2238 ± 38	1044 6374 ± 147	243 655 ± 16	261 660 ± 19
1202	veridas-008	1100495	1190915	958 8633	734 2048 ± 0	969 944 ± 12	673 945 ± 11	942 1334 ± 27	1054 2382 ± 48	1048 6959 ± 172	285 723 ± 14	303 731 ± 16
1203	veridas-009	1100503	625120	962 9163	443 2048 ± 0	554 589 ± 6	345 565 ± 5	322 576 ± 5	285 583 ± 5	292 666 ± 6	232 638 ± 5	249 638 ± 16
1204	veridas-010	1103722	623326	960 8991	817 2048 ± 0	735 714 ± 4	463 686 ± 4	445 705 ± 6	380 687 ± 4	312 693 ± 5	236 644 ± 2	252 644 ± 4
1205	veridium-000	0	47198	25 98	1363 29399 ± 2045	27 79 ± 0	17 80 ± 0	16 89 ± 0	13 90 ± 0	13 111 ± 0	1320 64880 ± 171	1318 64697 ± 247
1206	veridium-001	0	40561	44 142	1088 2489 ± 0	13 44 ± 0	9 45 ± 0	6 48 ± 0	6 50 ± 0	8 72 ± 0	1319 63417 ± 1061	1316 63225 ± 2133
1207	veridium-002	0	52482	50 161	1087 2486 ± 0	4 25 ± 0	2 25 ± 0	3 29 ± 0	3 30 ± 0	3 51 ± 0	1280 43891 ± 177	1281 43918 ± 167
1208	veridium-003	0	25975	38 136	1089 2490 ± 0	5 27 ± 0	3 25 ± 0	2 28 ± 0	2 30 ± 0	4 53 ± 0	1263 34755 ± 140	1265 34828 ± 177
1209	verigram-000	256209	7798	709 2137	342 2048 ± 0	825 807 ± 1	571 821 ± 1	649 972 ± 2	885 1358 ± 3	994 2848 ± 13	458 1222 ± 17	466 1219 ± 17
1210	verigram-001	282155	11773	779 2638	487 2048 ± 0	660 664 ± 2	452 675 ± 2	543 833 ± 4	771 1202 ± 7	988 2733 ± 32	577 1664 ± 60	574 1648 ± 56
1211	verigram-002	1588249	20691	693 2057	1209 4096 ± 0	1333 1464 ± 3	1006 1406 ± 0	1034 1486 ± 1	945 1431 ± 0	888 1586 ± 5	1359 453119 ± 13595	1359 452140 ± 9654
1212	verigram-003	1590775	20692	692 2052	1135 4096 ± 0	708 691 ± 4	454 677 ± 1	419 677 ± 1	388 694 ± 1	356 746 ± 1	1274 38843 ± 1140	1277 38665 ± 1071
1213	verihubs-inteligensia-000	209562	51877	130 430	747 2048 ± 0	520 567 ± 0	1056 1558 ± 8	1049 1560 ± 8	996 1568 ± 8	895 1621 ± 8	1212 22351 ± 91	1216 22371 ± 81
1214	verihubs-inteligensia-001	216524	51916	132 437	368 2048 ± 0	516 564 ± 0	342 562 ± 0	312 566 ± 1	274 566 ± 0	243 600 ± 0	1204 21770 ± 84	1208 21735 ± 102
1215	verihubs-inteligensia-002	361105	17045	261 727	708 2048 ± 0	423 471 ± 0	263 458 ± 0	229 459 ± 0	201 463 ± 1	158 471 ± 0	1183 18131 ± 558	1185 17851 ± 197
1216	verijelas-000	254540	10322	633 1736	353 2048 ± 0	250 321 ± 0	149 325 ± 1	122 329 ± 0	111 335 ± 5	92 360 ± 0	1105 10267 ± 143	1105 10218 ± 109
1217	via-000	124422	11151	-	790 2048 ± 0	727 707 ± 8	513 740 ± 5	590 906 ± 41	568 941 ± 40	546 1040 ± 5	367 966 ± 28	390 1021 ± 44
1218	via-001	370255	11151	620 1697	868 2048 ± 0	994 964 ± 3	734 1011 ± 3	699 1026 ± 4	650 1045 ± 3	621 1137 ± 28	371 983 ± 31	379 989 ± 40
1219	via-004	530941	93634	530 1361	657 2048 ± 0	307 368 ± 0	209 397 ± 1	136 352 ± 1	126 364 ± 2	170 490 ± 1	58 255 ± 7	66 255 ± 8
1220	via-005	510729	93629	728 2257	546 2048 ± 0	489 538 ± 0	314 528 ± 0	284 525 ± 1	250 535 ± 2	246 601 ± 1	49 223 ± 2	50 222 ± 7
1221	via-006	1087232	93594	888 4074	859 2048 ± 0	897 872 ± 1	634 898 ± 1	619 941 ± 1	564 936 ± 2	518 993 ± 1	50 224 ± 2	53 230 ± 11
1222	viante-000	1244225	19718	576 1532	1022 2056 ± 0	1066 1054 ± 0	763 1059 ± 1	741 1075 ± 1	665 1070 ± 4	581 1087 ± 1	1034 6461 ± 44	1030 6424 ± 32
1223	viante-001	1401078	19722	655 1812	1013 2056 ± 0	1090 1094 ± 1	806 1117 ± 5	775 1119 ± 6	699 1120 ± 3	593 1103 ± 1	844 3158 ± 45	847 3143 ± 53
1224	viante-002	1247402	19718	578 1538	1029 2056 ± 0	1133 1152 ± 1	802 1113 ± 3	768 1109 ± 1	689 1107 ± 2	609 1121 ± 2	850 3213 ± 90	856 3207 ± 90
1225	videmo-000	139643	39470	-	519 2048 ± 0	73 142 ± 5	42 150 ± 4	34 150 ± 6	28 151 ± 4	22 155 ± 8	155 513 ± 16	158 523 ± 38
1226	videmo-001	212051	95063	92 309	694 2048 ± 0	131 199 ± 0	47 164 ± 0	39 164 ± 0	31 164 ± 0	23 165 ± 0	72 296 ± 17	77 288 ± 16
1227	videmo-002	212053	32963	98 333	494 2048 ± 0	129 199 ± 0	51 169 ± 0	41 169 ± 0	32 170 ± 0	25 170 ± 0	44 209 ± 7	44 208 ± 8
1228	videmo-003	173512	43964	136 447	115 512 ± 0	71 133 ± 0	30 111 ± 0	24 115 ± 0	21 114 ± 0	15 115 ± 0	3 75 ± 10	3 75 ± 16
1229	videonetics-001	30875	5963	11 61	113 512 ± 0	182 262 ± 3	116 273 ± 1	210 439 ± 3	485 820 ± 3	974 2393 ± 43	442 1153 ± 38	440 1142 ± 65
1230	videonetics-002	121981	6289	29 115	971 2052 ± 0	204 282 ± 5	132 295 ± 1	275 513 ± 4	638 1029 ± 3	1005 3151 ± 46	457 1219 ± 57	477 1262 ± 56
1231	viettelai-004	1506350	203627	832 3115	962 2052 ± 0	1368 2910 ± 0	1081 2922 ± 1	1077 2915 ± 0	1065 2917 ± 0	999 2944 ± 0	470 1274 ± 17	487 1290 ± 32
1232	viettelhightech-000	259471	215557	126 421	407 2048 ± 0	410 461 ± 1	265 461 ± 2	231 461 ± 1	206 467 ± 2	171 494 ± 0	190 599 ± 11	191 591 ± 13

Notes	
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3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 48: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1233	viettelhightech-001	461523	147432	432 1088	798 2048 ± 0	1079 1068 ± 1	774 1084 ± 1	799 1145 ± 4	825 1270 ± 4	939 2041 ± 2	189 598 ± 14	189 589 ± 5
1234	viettelhightech-002	461606	115515	394 1022	490 2048 ± 0	1356 1700 ± 1	1064 1665 ± 0	1054 1723 ± 1	1030 1893 ± 1	990 2742 ± 1	310 778 ± 4	317 783 ± 8
1235	vigilantsolutions-000	352218	389974	-	1365 31540 ± 0	912 884 ± 23	-	-	-	-	1184 18201 ± 94	1144 13030 ± 83
1236	vigilantsolutions-001	344685	89145	-	292 1544 ± 0	949 921 ± 2	-	-	-	-	237 644 ± 13	255 649 ± 16
1237	vigilantsolutions-002	344137	89162	-	1052 2060 ± 0	875 844 ± 2	-	-	-	-	250 679 ± 10	267 680 ± 7
1238	vigilantsolutions-003	343048	94301	-	297 1548 ± 0	853 824 ± 3	-	-	-	-	228 634 ± 19	248 638 ± 17
1239	vigilantsolutions-004	343048	125719	-	295 1548 ± 0	867 837 ± 6	-	-	-	-	258 686 ± 14	275 688 ± 17
1240	vigilantsolutions-005	343048	125719	-	301 1548 ± 0	866 837 ± 13	-	-	-	-	343 874 ± 22	247 637 ± 16
1241	vigilantsolutions-006	343048	125719	-	296 1548 ± 0	872 841 ± 8	-	-	-	-	358 939 ± 32	290 711 ± 37
1242	vigilantsolutions-007	255600	125715	-	294 1548 ± 0	445 493 ± 6	-	-	-	-	322 803 ± 35	327 800 ± 40
1243	vigilantsolutions-008	441835	47824	-	293 1548 ± 0	636 647 ± 2	-	-	-	-	346 889 ± 23	355 903 ± 44
1244	vigilantsolutions-009	348798	49973	-	299 1548 ± 0	596 615 ± 0	410 631 ± 0	374 632 ± 1	332 636 ± 0	285 659 ± 0	125 452 ± 11	132 451 ± 11
1245	vigilantsolutions-010	348798	49973	318 841	298 1548 ± 0	597 615 ± 0	408 631 ± 0	376 632 ± 0	331 636 ± 0	286 659 ± 0	144 490 ± 13	149 488 ± 11
1246	vigilantsolutions-011	255661	49973	197 591	300 1548 ± 0	345 402 ± 0	225 418 ± 0	190 418 ± 0	167 422 ± 0	144 445 ± 0	90 339 ± 20	107 366 ± 37
1247	vinai-000	402391	866522	401 1034	823 2048 ± 0	1094 1099 ± 1	788 1095 ± 1	754 1093 ± 1	683 1099 ± 1	614 1126 ± 1	826 2996 ± 20	833 2993 ± 26
1248	vinbigdata-001	271405	44746	198 591	608 2048 ± 0	1297 1400 ± 5	994 1393 ± 2	974 1391 ± 2	913 1393 ± 1	795 1404 ± 1	489 1351 ± 50	491 1310 ± 38
1249	vinbigdata-002	256322	138864	206 607	770 2048 ± 0	524 569 ± 2	351 572 ± 1	315 571 ± 1	277 572 ± 1	240 596 ± 1	689 2175 ± 44	687 2160 ± 53
1250	vinbigdata-003	259968	183557	102 342	820 2048 ± 0	878 849 ± 6	952 1312 ± 1	558 853 ± 2	864 1321 ± 2	417 832 ± 2	407 1074 ± 37	421 1086 ± 40
1251	vinbigdata-004	1570839	333050	839 3247	1138 4096 ± 0	1139 1162 ± 3	836 1155 ± 14	796 1141 ± 2	745 1171 ± 5	623 1140 ± 2	481 1299 ± 17	475 1252 ± 28
1252	vinbigdata-005	1106052	333050	731 2294	446 2048 ± 0	1178 1210 ± 1	900 1237 ± 1	878 1251 ± 1	797 1234 ± 1	711 1282 ± 7	57 251 ± 17	58 234 ± 16
1253	vinbigdata-006	1106052	333624	732 2294	799 2048 ± 0	1177 1210 ± 2	878 1205 ± 5	818 1175 ± 2	752 1178 ± 3	656 1202 ± 16	54 246 ± 16	56 232 ± 16
1254	vinbigdata-007	1106071	335755	733 2295	847 2048 ± 0	1172 1201 ± 10	846 1166 ± 3	879 1252 ± 6	814 1256 ± 15	695 1254 ± 20	56 249 ± 10	60 238 ± 16
1255	vion-000	228219	7533	156 498	967 2052 ± 0	265 333 ± 1	-	-	-	-	1276 39839 ± 3561	1238 26830 ± 2241
1256	visage-000	49218	70150	16 72	98 512 ± 0	6 27 ± 0	4 27 ± 0	4 31 ± 0	5 38 ± 0	6 63 ± 0	696 2220 ± 14	695 2218 ± 14
1257	visica-001	1	59680	13 68	210 1024 ± 0	76 144 ± 1	40 143 ± 1	36 151 ± 1	41 188 ± 2	104 383 ± 11	388 1035 ± 41	389 1017 ± 56
1258	visica-002	1	63831	33 126	839 2048 ± 0	65 124 ± 1	36 125 ± 1	37 156 ± 2	76 271 ± 4	459 892 ± 29	961 4759 ± 31	956 4630 ± 26
1259	visionbox-000	176501	190645	-	615 2048 ± 0	231 304 ± 7	-	-	-	-	575 1648 ± 57	461 1192 ± 42
1260	visionbox-001	256869	190645	-	414 2048 ± 0	1013 983 ± 7	785 1093 ± 46	958 1360 ± 68	1046 2181 ± 105	1041 5955 ± 281	444 1161 ± 22	449 1154 ± 20
1261	visionbox-002	259063	135281	208 613	1051 2059 ± 0	434 482 ± 1	282 482 ± 0	249 484 ± 1	223 492 ± 1	193 517 ± 3	655 1969 ± 44	649 1931 ± 42
1262	visionbox-003	259542	156891	492 1263	1059 2068 ± 0	683 678 ± 2	459 682 ± 1	420 682 ± 2	390 695 ± 2	351 739 ± 5	573 1643 ± 56	576 1649 ± 66
1263	visionbox-004	309730	154797	547 1422	1266 4116 ± 0	313 378 ± 1	186 369 ± 0	168 389 ± 5	158 402 ± 2	137 437 ± 4	671 2071 ± 31	676 2076 ± 41
1264	visionbox-005	309402	197528	642 1771	1265 4116 ± 0	281 350 ± 1	160 343 ± 1	133 351 ± 2	128 367 ± 5	148 454 ± 19	672 2074 ± 17	675 2067 ± 29
1265	visionbox-006	479723	170096	824 2995	1264 4107 ± 0	957 932 ± 2	698 973 ± 4	673 994 ± 6	620 1003 ± 11	608 1120 ± 20	664 2038 ± 74	664 2022 ± 31
1266	visionlabs-001	343661	127922	-	20 204 ± 0	967 943 ± 8	-	-	-	-	500 1395 ± 45	443 1148 ± 53
1267	visionlabs-002	591936	46855	-	60 264 ± 0	185 265 ± 8	-	-	-	-	318 796 ± 35	325 799 ± 31
1268	visionlabs-003	639849	15246	-	47 260 ± 0	155 231 ± 5	-	-	-	-	122 439 ± 23	134 454 ± 20
1269	visionlabs-004	313016	90858	-	29 256 ± 0	229 304 ± 0	-	-	-	-	329 827 ± 26	346 865 ± 32
1270	visionlabs-005	369602	16523	-	107 512 ± 0	240 313 ± 0	-	-	-	-	336 848 ± 26	353 889 ± 37
1271	visionlabs-006	353044	16655	-	109 512 ± 0	187 270 ± 0	-	-	-	-	266 698 ± 19	305 734 ± 28
1272	visionlabs-007	357204	16643	-	114 512 ± 0	191 272 ± 0	-	-	-	-	366 965 ± 41	374 972 ± 31
1273	visionlabs-008	706099	19705	-	96 512 ± 0	417 467 ± 1	-	-	-	-	362 955 ± 23	368 962 ± 25
1274	visionlabs-009	706099	19862	-	151 513 ± 0	466 515 ± 41	272 472 ± 1	243 474 ± 1	212 476 ± 1	199 521 ± 1	363 957 ± 28	372 965 ± 32
1275	visionlabs-010	1067280	19357	345 883	150 513 ± 0	751 730 ± 0	498 717 ± 1	449 709 ± 0	407 713 ± 1	349 739 ± 0	193 600 ± 41	231 626 ± 35
1276	visionlabs-011	1067280	19353	359 923	149 513 ± 0	753 731 ± 1	496 717 ± 1	450 710 ± 1	409 714 ± 1	353 741 ± 1	163 556 ± 26	171 559 ± 25

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1277	visteam-000	32729	17740	-	[288]1536 ± 0	[39]96 ± 7	[27]102 ± 8	[141]358 ± 19	[636]1022 ± 50	[1018]3987 ± 211	[1031]6361 ± 87	[1035]6668 ± 277
1278	visteam-001	186440	30878	-	[1175]4096 ± 0	[892]869 ± 7	[615]872 ± 6	[778]1121 ± 15	[1008]1719 ± 38	[1025]4375 ± 157	[1050]7054 ± 108	[1047]7025 ± 109
1279	visteam-002	186440	30888	-	[1185]4096 ± 0	[857]829 ± 5	[585]832 ± 6	[548]839 ± 7	[509]853 ± 6	[534]1013 ± 14	[1046]6952 ± 118	[1043]6970 ± 120
1280	visteam-003	215359	33730	[154]493	[1143]4096 ± 0	[1207]1249 ± 4	[910]1251 ± 4	[891]1266 ± 5	[829]1272 ± 5	[771]1370 ± 9	[1042]6816 ± 111	[1040]6816 ± 105
1281	visteam-004	61594	35369	[53]168	[534]2048 ± 0	[228]303 ± 5	[139]313 ± 6	[88]278 ± 4	[83]288 ± 4	[100]377 ± 7	[920]3936 ± 72	[926]3938 ± 79
1282	visteam-005	288140	35427	[104]347	[800]2048 ± 0	[1110]1117 ± 6	[795]1106 ± 6	[729]1060 ± 4	[666]1071 ± 4	[634]1156 ± 8	[918]3932 ± 97	[923]3932 ± 71
1283	visteam-006	339353	47921	[155]493	[803]2048 ± 0	[1036]1009 ± 1	[735]1015 ± 1	[710]1035 ± 2	[632]1014 ± 1	[553]1047 ± 2	[780]2711 ± 32	[785]2704 ± 41
1284	visteam-007	331673	264832	[150]485	[492]2048 ± 0	[582]611 ± 1	[402]625 ± 1	[367]626 ± 1	[311]615 ± 1	[278]647 ± 0	[779]2704 ± 38	[789]2732 ± 54
1285	visteam-008	582800	264832	[263]731	[676]2048 ± 0	[1157]1179 ± 1	[849]1173 ± 1	[848]1210 ± 1	[764]1190 ± 3	[667]1208 ± 1	[772]2632 ± 28	[775]2647 ± 42
1286	visteam-009	582793	48090	[265]731	[356]2048 ± 0	[1149]1174 ± 1	[861]1184 ± 1	[852]1218 ± 2	[784]1219 ± 2	[692]1253 ± 2	[773]2668 ± 34	[778]2671 ± 38
1287	visteam-010	582793	48090	[267]731	[879]2048 ± 0	[1148]1174 ± 1	[876]1203 ± 2	[850]1215 ± 1	[786]1221 ± 1	[691]1252 ± 1	[775]2675 ± 51	[782]2681 ± 57
1288	vivotek-001	15240	247926	[35]128	[610]2048 ± 0	[44]100 ± 0	[26]101 ± 0	[22]106 ± 0	[27]134 ± 0	[44]238 ± 1	[1236]26504 ± 57	[1237]26520 ± 69
1289	vivotek-002	12769	247949	[32]124	[685]2048 ± 0	[37]93 ± 0	[21]93 ± 0	[19]98 ± 0	[16]95 ± 0	[21]150 ± 0	[730]2384 ± 19	[733]2385 ± 20
1290	vixvizion-000	183453	599571	-	[688]2048 ± 0	[371]425 ± 24	-	-	-	-	[433]1145 ± 25	[594]1718 ± 63
1291	vixvizion-001	282680	256875	-	[810]2048 ± 0	[824]807 ± 29	-	-	-	-	[390]1045 ± 22	[365]934 ± 45
1292	vixvizion-002	227766	318409	-	[654]2048 ± 0	[804]786 ± 1	[533]766 ± 2	[579]885 ± 3	[943]1430 ± 3	[1019]4080 ± 10	[249]676 ± 16	[235]630 ± 20
1293	vixvizion-003	254860	378019	-	[594]2048 ± 0	[889]865 ± 2	[668]938 ± 1	[1050]1577 ± 1	[1068]3002 ± 3	[1059]9521 ± 16	[295]738 ± 26	[270]683 ± 25
1294	vixvizion-004	254405	380049	-	[352]2048 ± 0	[608]624 ± 1	[365]587 ± 10	[368]626 ± 3	[295]592 ± 3	[329]717 ± 6	[302]760 ± 22	[284]703 ± 28
1295	vixvizion-005	38886	534579	[287]776	[567]2048 ± 0	[380]433 ± 4	[195]381 ± 3	[164]383 ± 3	[133]373 ± 1	[123]411 ± 1	[291]731 ± 63	[238]632 ± 32
1296	vixvizion-006	594053	396294	[528]1359	[624]2048 ± 0	[906]876 ± 9	[579]828 ± 3	[526]817 ± 1	[491]825 ± 2	[447]871 ± 1	[195]600 ± 23	[218]611 ± 25
1297	vixvizion-007	594053	470119	[558]1435	[703]2048 ± 0	[915]885 ± 35	[578]828 ± 1	[525]816 ± 1	[490]825 ± 1	[446]870 ± 1	[194]600 ± 28	[208]602 ± 34
1298	vnis-000	285395	1404886	[181]546	[651]2048 ± 0	[387]437 ± 1	[249]443 ± 1	[225]456 ± 2	[191]458 ± 2	[162]477 ± 2	[498]1386 ± 10	[508]1382 ± 16
1299	vnpay-000	258919	1404844	[158]504	[786]2048 ± 0	[160]239 ± 1	[101]248 ± 0	[82]252 ± 0	[69]249 ± 0	[52]260 ± 0	[490]1353 ± 11	[498]1353 ± 23
1300	vnpay-001	1044099	3060240	[362]937	[671]2048 ± 0	[1136]1156 ± 1	[912]1255 ± 1	[880]1252 ± 2	[820]1261 ± 2	[716]1288 ± 10	[510]1421 ± 32	[515]1421 ± 26
1301	vnpt-001	266499	535529	-	[324]2048 ± 0	[450]499 ± 2	[294]499 ± 2	[258]494 ± 3	[229]502 ± 3	[188]512 ± 2	[665]2049 ± 29	[99]337 ± 121
1302	vnpt-002	271649	3203296	-	[418]2048 ± 0	[759]739 ± 2	[506]731 ± 2	[477]740 ± 1	[430]742 ± 2	[367]763 ± 2	[306]766 ± 13	[311]762 ± 13
1303	vnpt-003	369956	297799	-	[1222]4096 ± 0	[1249]1315 ± 4	[954]1315 ± 4	[929]1318 ± 2	[880]1350 ± 3	[813]1428 ± 3	[1060]7397 ± 31	[1058]7384 ± 29
1304	vnpt-004	370110	240841	[382]992	[506]2048 ± 0	[1199]1238 ± 1	[904]1241 ± 1	[871]1242 ± 2	[849]1307 ± 2	[858]1505 ± 2	[930]4047 ± 48	[930]4008 ± 108
1305	vnpt-005	560630	240888	[456]1157	[686]2048 ± 0	[1302]1403 ± 0	[1002]1404 ± 6	[987]1403 ± 6	[957]1456 ± 0	[897]1630 ± 10	[889]3562 ± 23	[895]3554 ± 29
1306	vnpt-006	1114807	360198	[726]2245	[878]2048 ± 0	[1223]1277 ± 2	[991]1390 ± 19	[995]1410 ± 14	[975]1481 ± 30	[906]1703 ± 69	[869]3400 ± 20	[875]3393 ± 22
1307	vnpt-007	2113252	360190	[863]3622	[438]2048 ± 0	[1125]1143 ± 1	[838]1157 ± 4	[815]1170 ± 2	[754]1183 ± 3	[669]1219 ± 3	[878]3486 ± 41	[886]3485 ± 35
1308	vnpt-008	1114270	360190	[865]3641	[611]2048 ± 0	[1143]1165 ± 1	[862]1186 ± 2	[820]1177 ± 9	[769]1201 ± 2	[683]1244 ± 2	[881]3506 ± 16	[889]3510 ± 23
1309	vnpt-009	1114270	360190	[864]3641	[636]2048 ± 0	[1144]1166 ± 1	[870]1197 ± 6	[834]1193 ± 6	[779]1209 ± 3	[690]1251 ± 4	[886]3539 ± 17	[894]3551 ± 31
1310	vocalize-001	0	38841	[24]96	[126]512 ± 0	[18]57 ± 0	[12]55 ± 0	[8]56 ± 0	[8]60 ± 0	[5]62 ± 0	[502]1400 ± 59	[502]1365 ± 26
1311	vocord-001	616989	109135	-	[1323]6194 ± 0	[930]908 ± 16	-	-	-	-	[1365]1094730 ± 64282	[1365]1107193 ± 66523
1312	vocord-002	918292	648259	-	[284]1330 ± 0	[796]782 ± 36	-	-	-	-	[1344]83063 ± 517	[1342]83072 ± 714
1313	vocord-003	900909	1140643	-	[198]817 ± 0	[219]296 ± 3	-	-	-	-	[1288]46683 ± 378	[1269]36007 ± 292
1314	vocord-004	1754886	129419	-	[202]896 ± 0	[603]619 ± 1	-	-	-	-	[634]1885 ± 66	[638]1889 ± 71
1315	vocord-005	1060445	189974	-	[195]768 ± 0	[789]771 ± 1	-	-	-	-	[603]1768 ± 48	[590]1713 ± 77
1316	vocord-006	559457	189913	-	[194]768 ± 0	[916]886 ± 1	-	-	-	-	[660]2020 ± 72	[658]1969 ± 62
1317	vocord-007	587489	344995	-	[308]1664 ± 0	[795]780 ± 2	-	-	-	-	[767]2593 ± 83	[761]2526 ± 59
1318	vocord-008	603867	345047	-	[1102]2688 ± 0	[992]962 ± 2	[701]976 ± 2	[732]1061 ± 3	[799]1236 ± 23	[923]1851 ± 9	[829]3015 ± 50	[832]2988 ± 62
1319	vocord-009	1380132	201560	[900]4372	[314]1920 ± 0	[1337]1472 ± 2	[1044]1472 ± 1	[1046]1549 ± 1	[1004]1667 ± 2	[941]2064 ± 2	[668]2052 ± 50	[672]2056 ± 39
1320	vocord-010	902552	206873	[877]3866	[273]1088 ± 0	[1331]1459 ± 2	[1040]1459 ± 1	[1026]1463 ± 2	[976]1484 ± 1	[874]1535 ± 3	[786]2724 ± 31	[777]2653 ± 45

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	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1321	vsoft-001	10202	61965	[58]175	[663]2048 ± 0	[64]123 ± 8	[38]131 ± 7	[240]468 ± 19	[939]1422 ± 48	[1039]5622 ± 229	[762]2553 ± 48	[768]2559 ± 44
1322	vsoft-002	10202	62518	[55]169	[665]2048 ± 0	[86]160 ± 10	[48]164 ± 11	[293]537 ± 21	[997]1581 ± 53	[1042]6279 ± 228	[929]4030 ± 260	[919]3902 ± 137
1323	vtcc-000	284612	132031	[212]619	[445]2048 ± 0	[242]315 ± 0	[144]317 ± 0	[115]321 ± 0	[104]322 ± 0	[74]334 ± 1	[1209]22074 ± 112	[1215]22173 ± 163
1324	vtcc-001	528186	132058	[472]1189	[616]2048 ± 0	[736]715 ± 1	-	-	-	-	[1214]22740 ± 167	[1344]86287 ± 1073
1325	vtcc-002	528186	132049	[436]1094	[545]2048 ± 0	[732]712 ± 1	[504]729 ± 0	[461]724 ± 0	[425]735 ± 0	[348]738 ± 5	[1235]26231 ± 154	[1345]89838 ± 1111
1326	vtcc-003	528138	130904	[435]1093	[649]2048 ± 0	[729]710 ± 1	[499]720 ± 0	[479]743 ± 3	[458]782 ± 0	[666]1207 ± 1	[597]1743 ± 11	[598]1728 ± 7
1327	vts-000	256589	169760	[619]1697	[797]2048 ± 0	[440]486 ± 1	[281]481 ± 0	[250]484 ± 0	[218]485 ± 1	[194]517 ± 0	[1349]124209 ± 352	[1349]123652 ± 358
1328	vts-001	293000	475743	[213]622	[873]2048 ± 0	[676]676 ± 1	[462]683 ± 6	[425]687 ± 3	[389]695 ± 2	[321]709 ± 2	[1097]9620 ± 44	[1095]9618 ± 54
1329	vts-002	361977	904603	[317]840	[472]2048 ± 0	[364]416 ± 5	[238]434 ± 3	[202]432 ± 3	[184]449 ± 3	[223]556 ± 4	[1062]7447 ± 34	[1060]7450 ± 54
1330	wicket-000	826392	641802	[697]2071	[862]2048 ± 0	[1310]1419 ± 2	[1023]1429 ± 3	[1010]1444 ± 4	[962]1460 ± 3	[876]1537 ± 6	[1315]60976 ± 232	[1312]61096 ± 323
1331	winsense-000	270819	32034	-	[282]1280 ± 0	[206]283 ± 1	-	-	-	-	[556]1551 ± 31	[556]1532 ± 42
1332	winsense-001	264428	32035	[358]922	[281]1280 ± 0	[783]766 ± 7	[760]1058 ± 47	[659]983 ± 97	[653]1053 ± 119	[739]1320 ± 84	[571]1631 ± 28	[657]1964 ± 171
1333	winsense-002	281379	25780	[662]1855	[399]2048 ± 0	[446]494 ± 2	[293]498 ± 1	[281]519 ± 1	[251]537 ± 1	[266]634 ± 1	[581]1683 ± 8	[581]1685 ± 7
1334	wiseai-001	189467	60781	[72]245	[336]2048 ± 0	[162]240 ± 0	[103]251 ± 0	[119]328 ± 1	[107]327 ± 0	[73]332 ± 0	[805]2850 ± 29	[810]2852 ± 31
1335	wuhantianyu-001	465118	66457	[429]1086	[614]2048 ± 0	[631]642 ± 1	[421]642 ± 1	[392]644 ± 0	[346]652 ± 0	[316]697 ± 0	[1087]9502 ± 151	[1102]9920 ± 253
1336	x-laboratory-000	520020	197310	[574]1524	[985]2056 ± 0	[826]808 ± 7	[633]897 ± 113	[592]907 ± 103	[531]886 ± 103	[296]673 ± 39	[287]725 ± 19	[307]749 ± 34
1337	x-laboratory-001	625140	398792	[658]1844	[1037]2056 ± 0	[547]586 ± 2	[372]596 ± 5	[341]603 ± 6	[317]620 ± 7	[391]793 ± 14	[325]813 ± 28	[347]872 ± 32
1338	xforwardai-000	242457	175556	-	[537]2048 ± 0	[775]757 ± 6	-	-	-	-	[451]1185 ± 44	[453]1157 ± 44
1339	xforwardai-001	340100	51163	[715]2176	[536]2048 ± 0	[1158]1180 ± 2	[858]1182 ± 1	[836]1194 ± 1	[761]1186 ± 2	[659]1203 ± 1	[311]779 ± 17	[322]797 ± 13
1340	xforwardai-002	707715	51163	[689]2003	[1186]4096 ± 0	[971]944 ± 1	[672]942 ± 1	[623]943 ± 4	[562]935 ± 1	[499]967 ± 1	[509]1406 ± 8	[511]1405 ± 13
1341	xm-000	578041	148920	[242]684	[947]2052 ± 0	[908]878 ± 2	[624]882 ± 1	[664]988 ± 2	[816]1258 ± 3	[977]2434 ± 7	[572]1634 ± 17	[570]1632 ± 20
1342	yisheng-000	122704	41760	-	[701]2048 ± 0	[47]103 ± 1	-	-	-	-	[313]790 ± 23	[319]789 ± 20
1343	yisheng-001	120112	41760	-	[787]2048 ± 0	[46]103 ± 1	-	-	-	-	[350]906 ± 31	[359]905 ± 25
1344	yisheng-002	604097	42014	-	[285]1348 ± 0	[262]332 ± 1	-	-	-	-	[206]613 ± 40	[186]588 ± 26
1345	yisheng-004	486351	38653	[500]1279	[1125]3704 ± 0	[314]378 ± 12	-	-	-	-	[263]693 ± 137	[159]526 ± 34
1346	yitu-000	2211068	76146	-	[1268]4130 ± 0	[669]672 ± 2	-	-	-	-	[1265]35352 ± 114	[1274]37848 ± 1773
1347	yitu-001	2069440	138901	-	[1276]4146 ± 0	[768]751 ± 0	-	-	-	-	[1271]37810 ± 127	[1268]35486 ± 203
1348	yitu-002	1726673	138901	-	[1277]4147 ± 0	[707]691 ± 0	-	-	-	-	[1266]35435 ± 111	[1266]35325 ± 131
1349	yitu-003	1525719	138919	[870]3737	[1069]2082 ± 0	[886]860 ± 0	-	-	-	-	[1185]18305 ± 71	[1188]18286 ± 62
1350	yoonik-000	290414	206059	-	[630]2048 ± 0	[963]941 ± 3	[691]965 ± 13	[644]964 ± 10	[587]964 ± 9	[504]974 ± 23	[424]1116 ± 34	[431]1113 ± 54
1351	yoonik-001	346629	265353	-	[500]2048 ± 0	[1188]1223 ± 3	[903]1238 ± 1	[866]1238 ± 1	[802]1240 ± 1	[681]1240 ± 1	[273]706 ± 29	[276]690 ± 26
1352	yoonik-002	453720	265415	[797]2737	[684]2048 ± 0	[1127]1145 ± 4	[809]1123 ± 2	[783]1124 ± 2	[706]1125 ± 2	[615]1126 ± 3	[304]761 ± 32	[306]736 ± 32
1353	yoonik-003	346691	265415	[713]2161	[483]2048 ± 0	[1019]991 ± 3	[707]980 ± 1	[660]984 ± 4	[595]982 ± 1	[509]983 ± 1	[255]684 ± 45	[265]678 ± 41
1354	yoonik-004	469597	88673	[293]792	[876]2048 ± 0	[1184]1219 ± 1	[931]1284 ± 1	[884]1255 ± 1	[823]1266 ± 0	[689]1251 ± 1	[389]1039 ± 42	[395]1030 ± 40
1355	yoti-001	267246	470114	[446]1125	[679]2048 ± 0	[1200]1238 ± 4	[956]1316 ± 17	[1081]4099 ± 13	[1075]4160 ± 45	[1031]4774 ± 95	[1107]10352 ± 247	[1109]10364 ± 246
1356	yoti-002	164043	470114	[428]1086	[748]2048 ± 0	[575]604 ± 1	[560]802 ± 3	[519]812 ± 4	[565]938 ± 15	[773]1373 ± 4	[1110]10662 ± 805	[1108]10320 ± 265
1357	ytu-000	1477360	44032	[760]2484	[372]2048 ± 0	[478]530 ± 0	[319]533 ± 0	[389]640 ± 0	[516]861 ± 2	[930]1949 ± 8	[1252]31797 ± 131	[1253]31794 ± 133
1358	yuan-000	370472	331437	-	[560]2048 ± 0	[1106]1112 ± 6	-	-	-	-	[794]2777 ± 44	[823]2937 ± 87
1359	yuan-001	370473	189558	-	[428]2048 ± 0	[1282]1383 ± 3	[996]1394 ± 3	[992]1408 ± 3	[963]1461 ± 4	[894]1615 ± 4	[725]2344 ± 25	[722]2325 ± 42
1360	yuan-002	370472	165662	-	[346]2048 ± 0	[1312]1420 ± 3	[1022]1429 ± 4	[1042]1511 ± 4	[1005]1695 ± 4	[975]2408 ± 5	[715]2297 ± 23	[719]2310 ± 31
1361	yuan-003	370419	147783	-	[838]2048 ± 0	[1303]1405 ± 2	[1011]1413 ± 3	[1014]1446 ± 3	[989]1547 ± 5	[926]1878 ± 5	[720]2320 ± 32	[711]2287 ± 34
1362	yuan-004	428665	50011	[527]1356	[1164]4096 ± 0	[519]567 ± 0	[349]569 ± 0	[316]573 ± 0	[280]579 ± 0	[249]607 ± 0	[1008]5816 ± 35	[1009]5800 ± 31
1363	yuan-005	258312	145564	[320]843	[780]2048 ± 0	[321]381 ± 0	[197]386 ± 0	[166]387 ± 2	[146]390 ± 4	[130]421 ± 3	[443]1156 ± 8	[462]1196 ± 26
1364	yuan-006	1622733	145572	[899]4371	[1203]4096 ± 0	[1224]1280 ± 2	[922]1268 ± 1	[897]1273 ± 0	[827]1272 ± 2	[730]1306 ± 3	[694]2202 ± 19	[692]2190 ± 20

Notes	
1	The configuration size does not capture static data included in libraries.
2	The library size is the combined total of all files provided in the submission lib folder. These libraries e.g. OpenCV may or may not be installed on any end user's platform natively and would not need to be installed with the algorithm. Some developers put neural network models in their libraries.
3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 51: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	ALGORITHM	CONFIG	LIBRARY	TEMPLATE						COMPARISON[4]	
	NAME	DATA	DATA	MEMORY	SIZE	GENERATION TIME (ms)[4]				TIME (ns)[5]	
		(KB)[1]	(KB)[2]	(MB)[3]	(B)	MUGSHOT	480x720	960x1440	1600x2400	3000x4500	GENUINE	IMPOSTOR
1365	yuan-007	258312	145568	[601]1614	[331]2048 ± 0	[293]359 ± 0	[176]361 ± 1	[160]379 ± 4	[137]380 ± 0	[127]417 ± 0	[281]715 ± 4	[300]726 ± 16
1366	yuan-008	620369	167833	[602]1626	[1156]4096 ± 0	[1145]1169 ± 0	[526]752 ± 0	[484]752 ± 3	[452]775 ± 4	[387]782 ± 0	[492]1362 ± 16	[504]1377 ± 19
1367	yuan-009	1161457	167833	[763]2507	[1194]4096 ± 0	[1305]1408 ± 2	[1016]1418 ± 2	[1030]1471 ± 1	[909]1387 ± 8	[803]1414 ± 12	[484]1326 ± 11	[494]1336 ± 29
1368	yuan-010	1054332	167833	[762]2499	[1147]4096 ± 0	[1222]1276 ± 1	[1008]1406 ± 8	[913]1294 ± 1	[852]1308 ± 2	[776]1375 ± 2	[487]1331 ± 22	[496]1349 ± 47

Notes	
1	The configuration size does not capture static data included in libraries.
2	The library size is the combined total of all files provided in the submission lib folder. These libraries e.g. OpenCV may or may not be installed on any end user's platform natively and would not need to be installed with the algorithm. Some developers put neural network models in their libraries.
3	The memory usage is the peak resident set size reported by the ps system call during template generation.
4	The median template creation times are measured on Intel®Xeon®CPU E5-2630 v4 @ 2.20GHz processors.
5	The comparison durations, in nanoseconds, are estimated using std::chrono::high_resolution_clock which on the machine in (2) counts 1ns clock ticks. Precision is somewhat worse than that however. The ± value is the median absolute deviation times 1.48 for Normal consistency.

Table 52: Summary of algorithms and properties included in this report. The red superscripts give ranking for the quantity in that column.

	Algorithm	FALSE NON-MATCH RATE (FNMR)																	
		CONSTRAINED, COOPERATIVE																LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER			
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06			
1	2060io-001	-		-		0.9149	1240	0.9720	1236	0.9773	1196	0.9768	1063	0.8672	1093	0.9993	708		
2	2060io-002	-		-		0.8904	1238	0.9587	1234	0.9020	1182	1.0000	1192	1.0000	1210	1.0000	793		
3	20face-000	0.1268	936	0.1828	927	0.1748	1143	0.2768	1143	0.1765	1070	0.1864	789	0.0927	862	0.5943	522		
4	20face-001	0.0521	859	0.0732	852	0.1414	1137	0.2549	1139	0.0769	1019	0.1354	765	0.0419	773	0.8953	611		
5	3divi-000	-		0.1335	901	-		-		-		-		-		-			
6	3divi-001	0.0777	898	0.1540	914	-		-		-		-		-		-			
7	3divi-002	0.0788	900	0.1539	912	-		-		-		-		-		-			
8	3divi-003	0.0318	821	0.0588	831	0.0389	1052	0.0639	1046	0.0619	1005	0.0928	720	0.0555	813	-			
9	3divi-004	0.0095	550	0.0153	562	0.0097	816	0.0145	806	0.0175	797	0.0330	560	0.0242	678	-			
10	3divi-005	0.0094	546	0.0151	558	0.0078	742	0.0121	741	0.0135	721	0.0231	485	0.0156	558	-			
11	3divi-006	0.0064	430	0.0094	431	0.0047	566	0.0066	570	0.0091	598	0.0191	438	0.0113	453	0.2854	445		
12	3divi-007	0.0024	138	0.0038	151	0.0028	277	0.0034	279	0.0046	382	0.0101	279	0.0082	343	0.2515	426		
13	accurascan-001	0.3670	1002	0.4777	1008	0.5313	1190	0.6155	1183	0.5583	1133	0.6120	934	0.2569	956	0.8833	602		
14	accurascan-002	0.4209	1012	0.5213	1018	0.5826	1198	0.6642	1187	0.6295	1137	0.6937	952	0.3116	977	0.9162	618		
15	accurascan-003	0.0017	83	0.0028	92	0.0024	127	0.0024	98	0.0029	184	0.0057	102	0.0048	136	0.0629	104		
16	acer-000	0.1393	941	0.9075	1068	0.9981	1253	1.0000	1259	1.0000	1217	1.0000	1167	0.9998	1185	-			
17	acer-001	0.0294	806	0.0504	811	0.0240	1006	0.0463	1011	0.0436	965	0.0622	679	0.0360	754	-			
18	acer-002	0.0169	708	0.0262	708	0.0103	833	0.0167	853	0.0182	807	0.0281	523	0.0159	561	0.1555	351		
19	acisw-003	0.9682	1067	0.9971	1078	0.7892	1231	0.8738	1225	0.8752	1177	0.8275	998	0.6698	1052	-			
20	acisw-006	0.2945	990	0.9788	1074	0.6044	1200	0.7588	1198	0.9900	1200	1.0000	1170	0.9999	1191	-			
21	acisw-007	0.4276	1014	0.5493	1025	0.8425	1234	0.9185	1232	0.8424	1168	0.9976	1115	0.9930	1151	0.9999	739		
22	acisw-008	0.0100	567	0.0147	551	0.0094	803	0.0126	749	0.1740	1069	0.6651	947	0.4545	1014	0.9302	623		
23	adera-001	0.1021	918	0.1757	921	0.1823	1144	0.2967	1145	0.1714	1068	0.6357	938	0.1127	879	-			
24	adera-002	0.0052	353	0.0071	340	0.0047	559	0.0064	562	0.0087	580	0.0159	388	0.0136	514	-			
25	adera-003	0.0043	291	0.0059	283	0.0036	440	0.0043	400	0.0076	538	0.0151	373	0.0128	494	0.1526	350		
26	adera-004	0.0014	54	0.0022	55	0.0035	430	0.0050	457	0.0023	77	0.0212	458	0.0058	204	0.1469	342		
27	adera-005	0.0017	76	0.0026	75	0.0027	251	0.0030	211	0.0024	89	0.0134	341	0.0049	140	0.1246	303		
28	advance-002	0.0089	527	0.0137	533	0.0073	721	0.0115	729	0.0400	953	0.0722	701	0.0593	821	-			
29	advance-003	0.0060	410	0.0087	411	0.0052	602	0.0067	573	0.0389	951	0.4914	902	0.1291	892	0.7998	574		
30	advance-004	0.0083	513	0.0101	464	0.0037	465	0.0054	490	0.0051	416	0.3555	868	0.1088	875	0.8285	580		
31	advance-005	0.0059	402	0.0084	398	0.0043	529	0.0060	532	0.0065	496	0.9998	1154	0.9993	1173	1.0000	809		
32	affinsys-ai-000	-		-		0.1154	1127	0.1788	1120	0.1886	1076	0.2159	808	0.1383	900	0.6126	527		
33	afisbiometrics-000	0.0051	349	0.0073	349	0.0030	334	0.0050	461	0.0044	359	0.0077	181	0.0057	201	0.0796	186		
34	afrengine-000	0.6244	1045	0.7336	1052	0.8318	1233	0.9083	1229	0.8122	1160	0.9980	1119	0.9895	1147	1.0000	743		
35	afrengine-001	0.0071	463	0.0129	521	0.0094	807	0.0201	891	0.0097	629	0.9737	1062	0.8179	1084	0.9999	725		
36	afrengine-002	0.0052	356	0.0071	339	0.0032	374	0.0043	405	0.0194	830	0.2125	806	0.0450	784	0.2330	418		
37	afrengine-003	-		-		0.0028	291	0.0031	242	0.0116	682	0.0224	475	0.0208	646	0.0860	205		
38	afrengine-004	-		-		0.0027	265	0.0028	185	0.1475	1058	0.2477	828	0.2470	952	0.2062	403		
39	afrengine-005	-		-		0.0028	294	0.0031	228	0.0035	274	0.0078	186	0.0059	217	0.0768	174		
40	aifirst-001	0.0119	619	0.0170	595	0.0084	770	0.0127	759	0.0131	712	0.0212	457	0.0138	519	-			
41	aigen-001	0.0124	630	0.0219	662	0.0143	926	0.0217	903	0.0236	872	0.8960	1018	0.3255	983	-			
42	aigen-002	0.0192	736	0.0343	752	0.0256	1010	0.0402	989	0.0389	950	0.9196	1026	0.3876	999	0.9994	713		
43	aigroup-000	-		-		0.0683	1097	0.0774	1063	0.0612	1001	0.9816	1070	0.9069	1106	1.0000	1103		
44	aigroup-001	-		-		0.0114	873	0.0192	882	0.0179	800	0.9998	1156	0.9986	1170	1.0000	1142		

Table 53: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)													
		CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
45	ailabs-001	0.0158	694	0.0276	716	0.0192	968	0.0317	964	0.0352	935	0.0608	675	0.0434	778	-	
46	aimall-001	0.0176	719	0.0324	741	0.0225	995	0.0407	993	-		-		-		-	
47	aimall-002	0.0119	620	0.0167	589	0.0224	992	0.0411	994	0.0233	864	0.0373	601	0.0235	671	-	
48	aimall-003	0.0033	217	0.0041	172	0.0033	405	0.0035	310	0.0056	449	0.0109	300	0.0087	363	-	
49	aiseemu-001	0.0021	113	0.0029	98	0.0027	248	0.0033	266	0.0038	305	0.0339	573	0.0057	202	0.4819	496
50	aiseemu-002	0.0023	129	0.0032	113	0.0026	209	0.0027	156	0.0036	281	0.0439	619	0.0057	197	0.4259	484
51	aiunionface-000	0.0104	576	0.0154	565	0.0082	763	0.0122	744	0.0141	732	0.0243	492	0.0169	579	-	
52	aize-001	0.0223	762	0.0344	753	0.0199	974	0.0313	960	0.0367	942	0.0522	652	0.0359	752	0.2506	425
53	aize-002	0.0210	752	0.0327	742	0.0280	1020	0.0489	1022	0.0504	982	0.0692	696	0.0434	777	0.2657	437
54	aize-003	0.0086	520	0.0125	517	0.0072	713	0.0126	753	0.0516	986	0.6137	935	0.1038	871	0.9911	671
55	ajou-001	0.0093	544	0.0147	552	0.0071	712	0.0126	750	0.0173	794	0.0274	517	0.0186	612	-	
56	alchera-000	0.0165	705	0.0243	687	0.0125	895	0.0186	875	0.0204	839	0.0349	580	0.0243	680	-	
57	alchera-001	0.0183	728	0.0299	727	0.0142	921	0.0234	918	0.0239	879	0.0388	608	0.0267	702	-	
58	alchera-002	0.0107	588	0.0157	574	0.0104	837	0.0229	914	0.0144	740	0.0246	496	0.0198	633	-	
59	alchera-003	0.0044	298	0.0055	269	0.0031	350	0.0039	355	0.0042	342	0.0077	183	0.0065	239	0.0777	178
60	alchera-004	0.0035	241	0.0052	255	0.0028	298	0.0039	356	0.0029	188	0.0075	171	0.0044	115	0.0742	155
61	alchera-005	0.0027	167	0.0040	166	0.0026	201	0.0030	206	0.0025	122	0.0055	98	0.0040	89	0.0642	114
62	alchera-006	0.0028	175	0.0039	157	0.0026	208	0.0031	233	0.0025	115	0.0090	236	0.0042	97	0.0867	207
63	alchera-007	0.0034	236	0.0049	239	0.0026	207	0.0031	235	0.0026	142	0.0096	262	0.0044	110	0.0834	201
64	alchera-008	-		-		0.0026	196	0.0030	213	0.0024	108	0.0099	270	0.0043	104	0.0951	247
65	alchera-009	-		-		0.0026	229	0.0029	197	0.0022	62	0.5197	913	0.2232	948	0.8470	584
66	alfabeta-001	0.4867	1030	0.5831	1033	0.6855	1210	0.8156	1211	0.8253	1166	0.7765	976	0.6416	1050	0.9627	635
67	alice-000	0.0119	621	0.0192	631	0.0106	843	0.0170	856	0.0167	781	0.0265	511	0.0150	548	0.1824	381
68	alice-001	0.0034	234	0.0046	218	0.0032	372	0.0037	335	0.0030	212	0.3164	855	0.1088	876	0.8336	581
69	alleyes-000	0.0058	394	0.0090	419	0.0055	622	0.0087	664	0.0068	504	0.0105	291	0.0076	315	-	
70	allgovision-000	0.0346	830	0.0527	818	0.0232	1000	0.0339	967	0.0372	946	0.0620	678	0.0443	783	-	
71	alphaface-001	0.0065	436	0.0097	445	0.0039	487	0.0063	558	0.0083	566	-		-		-	
72	alphaface-002	0.0052	358	0.0075	360	0.0030	321	0.0044	414	1.0000	1227	0.0115	317	0.0084	354	-	
73	alttekglobal-000	-		-		0.0031	340	0.0046	423	0.0051	415	0.0097	268	0.0075	305	0.0927	241
74	amplifiedgroup-001	0.5034	1032	0.5848	1034	0.6973	1214	0.8316	1212	0.7807	1155	0.7724	973	0.6354	1046	-	
75	androvideo-000	0.0243	774	0.0438	789	0.0239	1004	0.0365	982	0.0483	976	0.1870	790	0.0635	826	-	
76	anke-000	0.0194	739	0.0260	706	-		-		-		-		-		-	
77	anke-001	0.0186	731	0.0238	684	-		-		-		-		-		-	
78	anke-002	0.0402	840	0.0759	858	0.0271	1018	0.0484	1020	-		-		-		-	
79	anke-003	0.0131	648	0.0213	655	0.0094	804	0.0175	858	0.0134	718	0.9951	1102	0.0150	547	-	
80	anke-004	0.0080	502	0.0154	564	0.0073	720	0.0112	723	0.0102	647	0.0178	419	0.0118	468	-	
81	anke-005	0.0070	455	0.0109	482	0.0059	651	0.0094	676	0.0105	653	0.0142	352	0.0102	417	-	
82	antheus-000	0.2564	982	0.3776	990	0.7240	1218	0.8699	1222	0.8899	1180	0.9872	1078	0.9483	1120	-	
83	antheus-001	0.1311	937	0.2306	948	0.5113	1188	0.6797	1189	0.8748	1176	0.9908	1088	0.9649	1131	-	
84	antheus-002	-		-		0.0119	883	0.0157	827	0.0104	652	0.9974	1113	0.9791	1138	1.0000	768
85	anyvision-001	0.0716	891	0.0859	869	-		-		-		-		-		-	
86	anyvision-002	0.0660	886	0.0898	875	0.0928	1114	0.1512	1109	0.0899	1033	0.1191	751	0.0801	845	-	
87	anyvision-004	0.0267	792	0.0385	772	0.0258	1012	0.0487	1021	0.0234	869	0.0301	535	0.0191	619	-	
88	anyvision-005	0.0023	132	0.0037	147	0.0027	272	0.0035	300	0.0049	403	0.0084	216	0.0069	265	-	

Table 54: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
89	aratek-001	0.0033	224	0.0045	212	0.0028	287	0.0031	243	0.0043	347	0.0092	245	0.0069	268	0.0897	221
90	armatura-001	0.0033	219	0.0042	184	0.0031	349	0.0037	329	0.0056	448	0.0110	301	0.0092	383	0.4625	492
91	armatura-002	0.0041	279	0.0052	251	0.0034	413	0.0044	407	0.0040	322	0.8502	1004	0.0275	707	0.9970	693
92	armatura-003	0.0020	107	0.0029	93	0.0026	222	0.0028	166	0.0025	127	0.0049	78	0.0043	105	0.0608	92
93	arvis-000	-		-		0.3652	1172	0.4777	1167	1.0000	1238	1.0000	1334	1.0000	1255	1.0000	1207
94	asr-000	-		-		0.5523	1192	0.7662	1199	0.8807	1178	1.0000	1198	1.0000	1197	1.0000	795
95	asr-001	-		-		0.0030	318	0.0039	353	0.0027	161	0.3390	860	0.1327	897	0.7167	551
96	asusaics-000	0.0125	638	0.0209	650	0.0085	772	0.0134	775	0.0143	738	0.7189	958	0.0285	714	-	
97	asusaics-001	0.0125	636	0.0210	652	0.0085	774	0.0134	776	0.0143	739	0.7437	964	0.0289	719	-	
98	autentika-000	0.1415	943	0.1916	932	0.4130	1179	0.5521	1176	0.4217	1123	0.9998	1152	0.9954	1157	1.0000	810
99	autentika-001	0.0444	850	0.0688	847	0.0987	1116	0.1531	1110	0.1547	1061	1.0000	1168	0.9997	1184	1.0000	786
100	autentika-002	0.0536	863	0.0866	871	0.0657	1094	0.1084	1088	0.1548	1062	0.9993	1133	0.9939	1153	1.0000	790
101	autentika-003	-		-		0.0203	976	0.0314	961	0.0404	955	0.9791	1066	0.9294	1114	0.9994	712
102	authenmetric-002	0.0092	539	0.0134	527	0.0095	808	0.0177	860	0.0192	823	0.0463	632	0.0236	673	-	
103	authenmetric-003	0.0036	249	0.0053	264	0.0039	494	0.0051	466	0.0095	620	0.9930	1095	0.5932	1038	1.0000	761
104	authenmetric-004	0.0027	169	0.0042	183	0.0033	396	0.0036	325	0.0083	569	0.9879	1081	0.4058	1006	1.0000	752
105	authme-001	0.0036	247	0.0049	237	0.0037	467	0.0040	364	0.0030	209	0.3075	849	0.1310	895	0.7046	545
106	authme-002	-		-		0.0032	379	0.0035	303	0.0026	150	0.4284	891	0.2115	944	0.7861	570
107	aware-000	0.1965	964	0.3090	972	-		-		-		-		-		-	
108	aware-001	0.1965	965	0.3092	973	-		-		-		-		-		-	
109	aware-002	0.1951	963	0.3202	976	-		-		-		-		-		-	
110	aware-003	0.0793	901	0.1161	895	0.1028	1118	0.1708	1116	0.1698	1067	0.2333	819	0.1174	885	-	
111	aware-004	0.0690	889	0.0949	881	0.0837	1109	0.1436	1107	0.1171	1047	0.8137	989	0.1056	872	-	
112	aware-005	0.0457	853	0.0643	837	0.0603	1088	0.1094	1092	0.0613	1002	0.1075	740	0.0491	796	-	
113	aware-006	0.0487	856	0.0819	865	0.0529	1081	0.1090	1090	0.1011	1043	0.1058	735	0.0502	800	0.5309	505
114	aware-007	0.0101	572	0.0198	641	0.0060	661	0.0133	772	0.0224	855	0.5813	926	0.1673	926	0.8871	606
115	aware-008	-		-		0.0062	669	0.0143	803	0.0135	720	0.0332	563	0.0133	503	0.3622	463
116	awiros-001	0.4044	1008	0.4622	1005	0.5530	1193	0.6518	1185	0.2008	1078	0.1994	796	0.1386	902	-	
117	awiros-002	0.1990	968	0.2561	955	0.3319	1169	0.4411	1165	0.3821	1116	0.9938	1097	0.2634	962	-	
118	awiros-003	-		-		0.0128	902	0.0158	832	0.9978	1204	1.0000	1189	1.0000	1203	1.0000	801
119	awiros-004	-		-		0.0158	951	0.0255	928	0.9981	1207	1.0000	1191	1.0000	1208	1.0000	765
120	aximetria-001	0.0111	598	0.0186	621	0.0110	853	0.0148	814	0.0170	787	0.3928	881	0.2090	942	0.7924	571
121	ayftech-001	0.0946	913	0.1941	934	0.2438	1157	0.3625	1155	0.1558	1063	0.1589	778	0.0936	864	-	
122	ayftech-003	0.0023	134	0.0037	143	0.0026	230	0.0030	225	0.0072	523	0.5411	918	0.2515	953	0.8902	607
123	ayonix-000	0.4351	1017	0.4872	1011	0.6150	1202	0.7510	1197	0.6557	1142	0.6361	939	0.4981	1021	-	
124	beethedata-000	0.0127	642	0.0195	635	0.0092	793	0.0157	828	0.0171	790	0.0306	539	0.0204	639	0.1617	363
125	betaface-000	0.8804	1060	0.8998	1064	-		-		-		-		-		-	
126	betaface-002	0.8813	1061	0.8998	1065	-		-		-		-		-		-	
127	beyneai-000	0.0071	468	0.0107	479	0.0104	838	0.0131	768	0.0170	788	0.9837	1072	0.6171	1042	1.0000	741
128	biocube-001	0.5596	1040	0.6834	1046	0.7700	1229	0.8712	1223	0.8446	1169	0.9661	1057	0.7922	1080	0.9846	661
129	biocube-002	0.0612	875	0.0856	868	0.2330	1155	0.2972	1146	0.2365	1094	0.9327	1039	0.6947	1056	0.9989	703
130	bioid-001	-		-		0.0121	887	0.0197	889	0.0148	745	0.9883	1082	0.7807	1077	0.9997	719
131	bioid-002	-		-		0.0127	900	0.0205	894	0.0158	761	0.7684	972	0.0224	660	0.9859	662
132	bioid-003	-		-		0.0083	767	0.0137	783	0.0112	673	0.1141	745	0.0135	508	0.3783	471

Table 55: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
133	bioidtechswiss-000	0.0066	443	0.0082	393	0.0113	869	0.0225	909	0.0078	547	0.0139	348	0.0092	378	-	
134	bioidtechswiss-001	0.0054	368	0.0072	345	0.0069	702	0.0124	747	0.0060	468	0.0094	255	0.0065	247	-	
135	bioidtechswiss-002	0.0049	329	0.0067	323	0.0064	676	0.0116	731	0.0067	501	0.0117	321	0.0086	360	-	
136	bioidtechswiss-003	-		-		0.0045	545	0.0050	459	0.0193	827	0.0360	588	0.0356	748	0.1320	311
137	biometric-vision-000	0.0023	131	0.0036	136	0.0028	290	0.0034	293	0.0028	181	0.3109	852	0.1504	911	0.6849	541
138	biometrik-001	-		-		0.7415	1222	0.8509	1215	0.9980	1206	1.0000	1206	0.9877	1145	1.0000	1093
139	bm-001	0.7431	1052	0.9494	1072	0.9586	1245	0.9843	1241	0.9049	1183	0.9021	1022	0.8395	1088	-	
140	boetech-001	0.0662	887	0.0802	863	0.0493	1074	0.0791	1065	0.0682	1013	0.1074	739	0.0758	839	0.9951	681
141	boetech-002	0.0535	862	0.0565	827	0.0114	871	0.0136	780	0.0403	954	0.0650	682	0.0606	822	0.3470	461
142	bresee-000	0.8467	1058	0.9472	1070	0.9819	1246	0.9903	1242	0.9940	1202	0.9919	1091	0.9760	1136	-	
143	bresee-001	0.0085	517	0.0143	542	0.0086	780	0.0153	821	0.0108	662	0.0168	405	0.0115	460	-	
144	bresee-002	0.0079	498	0.0101	460	0.0065	685	0.0079	633	0.0129	704	0.0263	509	0.0224	661	0.2137	409
145	btsdigital-001	-		-		0.0046	554	0.0072	599	0.0077	541	0.0141	350	0.0092	381	0.1256	306
146	cakevn-001	-		-		0.0311	1036	0.0677	1051	0.0212	846	0.1427	770	0.0185	609	0.9170	620
147	camvi-001	0.3822	1006	0.5375	1022	-		-		-		-		-		-	
148	camvi-002	0.0125	637	0.0221	665	0.0089	787	0.0145	808	0.0142	735	0.2650	833	0.0166	577	-	
149	camvi-003	0.0184	730	0.0320	739	0.0134	911	0.0255	929	-		-		-		-	
150	camvi-004	0.0171	712	0.0316	738	0.0042	521	0.0049	453	0.0097	631	0.6636	946	0.0141	526	-	
151	candour-001	0.1048	921	0.3189	975	0.0130	906	0.0182	867	0.3879	1118	0.9216	1028	0.7071	1061	0.9836	656
152	candour-002	-		-		0.0036	446	0.0061	546	0.1489	1060	0.4137	888	0.2751	966	0.8795	598
153	candour-003	-		-		0.0040	504	0.0068	579	0.0041	335	0.1321	761	0.0225	663	0.6090	526
154	candour-004	-		-		0.0027	262	0.0039	361	0.0030	203	0.1049	734	0.0121	479	0.5691	514
155	canon-002	0.0034	237	0.0050	245	0.0026	231	0.0033	260	0.0043	353	0.0182	423	0.0065	245	-	
156	canon-003	0.0041	283	0.0059	284	0.0030	319	0.0040	366	0.0040	317	0.0073	165	0.0059	211	0.0735	152
157	canon-004	0.0052	357	0.0091	422	0.0033	403	0.0058	518	0.0037	290	0.0770	708	0.0494	797	0.3192	456
158	canon-005	0.0024	137	0.0035	131	0.0025	176	0.0033	276	0.0052	426	0.0096	265	0.0090	371	0.0542	60
159	cchonolulu-000	0.7910	1056	0.8611	1060	0.9824	1247	0.9926	1244	0.9940	1201	0.9861	1073	0.9534	1122	1.0000	744
160	cchonolulu-001	0.4202	1011	0.4853	1010	0.6298	1203	0.7694	1200	0.7402	1148	0.9720	1061	0.8870	1102	0.9951	682
161	cdachyd-001	-		-		0.7397	1221	0.8335	1213	0.7630	1150	0.7410	962	0.5756	1036	0.9588	632
162	ceiec-001	0.0328	825	0.0475	802	0.0295	1033	0.0478	1018	0.0621	1006	0.1059	736	0.0932	863	-	
163	ceiec-002	0.0161	701	0.0193	632	0.0122	890	0.0164	849	0.0270	896	0.0555	659	0.0472	793	-	
164	ceiec-003	0.0071	465	0.0107	476	0.0061	665	0.0079	638	0.0160	766	0.0316	546	0.0260	695	-	
165	ceiec-004	0.0038	264	0.0051	250	0.0045	551	0.0053	479	0.0062	485	0.3939	883	0.0104	427	-	
166	celloscope-001	-		-		0.1245	1131	0.1840	1121	0.1886	1075	0.2636	832	0.1485	910	0.7055	548
167	chosun-000	0.8481	1059	1.0000	1301	1.0000	1358	0.9999	1257	1.0000	1361	1.0000	1233	1.0000	1329	-	
168	chosun-001	0.0525	860	0.0936	879	0.0742	1101	0.1263	1101	0.0978	1040	1.0000	1194	0.9354	1115	-	
169	chosun-002	0.0390	839	0.0646	838	0.0339	1041	0.0576	1038	0.0455	972	0.6904	950	0.1746	927	-	
170	chtface-001	0.9993	1071	0.9994	1079	0.9999	1260	0.9996	1250	1.0000	1216	1.0000	1171	0.9999	1192	-	
171	chtface-002	0.0150	683	0.0268	710	0.0096	815	0.0140	794	0.0186	812	0.0320	552	0.0194	627	-	
172	chtface-003	0.0091	534	0.0146	549	0.0083	769	0.0128	761	0.0132	713	0.0220	470	0.0149	545	-	
173	chtface-004	0.0046	320	0.0062	308	0.0052	601	0.0080	640	0.0088	591	0.0152	374	0.0106	432	0.1152	286
174	chtface-005	0.0033	218	0.0049	231	0.0029	305	0.0041	379	0.0044	358	0.0317	549	0.0066	250	0.1952	396
175	chtface-006	0.0029	181	0.0043	186	0.0026	237	0.0034	294	0.0040	323	0.2701	837	0.0065	243	0.4464	488
176	chtface-007	-		-		0.0025	175	0.0032	250	0.0040	319	0.2018	798	0.0064	238	0.4751	495

Table 56: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
177	chtface-008	-		-		0.0022	54	0.0026	126	0.0025	123	0.1246	755	0.0400	765	0.4384	487
178	chtface-009	-		-		0.0023	78	0.0027	147	0.0024	101	0.3659	873	0.1226	890	0.7714	562
179	canon-000	0.0084	515	0.0156	572	0.0049	581	0.0051	468	0.0275	904	0.1371	767	0.0138	521	-	
180	canon-001	0.0041	280	0.0061	293	0.0030	338	0.0041	377	0.0048	395	0.0578	664	0.0069	267	-	
181	cist-001	0.0046	312	0.0065	315	0.0042	525	0.0063	556	0.9675	1195	0.9997	1147	0.9994	1175	1.0000	754
182	cist-002	0.0073	475	0.0096	444	0.0085	775	0.0090	670	0.9990	1209	0.9997	1146	0.9996	1182	0.9998	721
183	cist-003	0.0065	437	0.0087	409	0.0046	557	0.0068	578	0.9993	1211	0.9994	1136	0.9993	1174	0.9995	715
184	cist-004	0.0043	296	0.0062	298	0.0031	347	0.0041	384	0.0031	218	0.0363	594	0.0069	270	0.2732	439
185	clearviewai-000	0.0010	28	0.0019	44	0.0024	111	0.0028	172	0.0030	198	0.0058	105	0.0050	144	0.0604	90
186	clearviewai-001	0.0015	62	0.0021	49	0.0024	115	0.0030	215	0.0022	70	0.0745	703	0.0194	626	0.2740	440
187	clearviewai-002	-		-		0.0024	113	0.0031	241	0.0022	68	0.0042	43	0.0037	58	0.0531	50
188	clearviewai-003	-		-		0.0023	62	0.0025	106	0.0022	65	0.0042	45	0.0038	61	0.0533	51
189	closeli-001	0.0136	654	0.0163	580	0.0039	491	0.0054	488	0.0072	521	1.0000	1172	0.0094	391	1.0000	803
190	cloudmatrix-000	0.0192	737	0.0340	749	0.0133	910	0.0220	905	0.9837	1198	1.0000	1178	0.0281	708	-	
191	cloudmatrix-001	0.0668	888	0.1141	894	0.0539	1082	0.0905	1079	0.3509	1112	0.9819	1071	0.9010	1105	0.9999	726
192	cloudmatrix-002	0.0075	481	0.0113	495	0.0084	771	0.0120	735	0.9248	1188	0.9997	1145	0.9985	1169	1.0000	812
193	cloudwalk-hr-000	0.0265	791	0.0434	787	0.0340	1042	0.0646	1048	-		-		-		-	
194	cloudwalk-hr-001	0.0044	299	0.0072	348	0.0073	723	0.0108	717	0.0125	697	0.0228	482	0.0145	537	-	
195	cloudwalk-hr-002	0.0043	294	0.0059	286	0.0054	614	0.0076	616	0.0076	539	0.5932	930	0.0093	386	-	
196	cloudwalk-hr-003	0.0026	163	0.0041	173	0.0040	501	0.0058	517	0.0060	477	0.9992	1130	0.0094	387	-	
197	cloudwalk-hr-004	0.0009	17	0.0018	37	0.0034	408	0.0028	182	0.0052	421	0.9992	1131	0.0093	385	-	
198	cloudwalk-mt-000	0.0100	564	0.0170	594	0.0074	728	0.0118	733	0.0127	700	0.0197	444	0.0129	496	-	
199	cloudwalk-mt-002	0.0064	433	0.0085	403	0.0054	617	0.0098	695	0.0070	514	0.0108	298	0.0076	314	-	
200	cloudwalk-mt-003	0.0013	49	0.0022	53	0.0026	198	0.0027	155	0.0039	309	0.0076	172	0.0067	253	-	
201	cloudwalk-mt-004	0.0009	24	0.0013	16	0.0024	125	0.0021	24	0.0028	171	0.0054	95	0.0050	145	0.0572	75
202	cloudwalk-mt-005	0.0006	7	0.0009	9	0.0025	171	0.0022	47	0.0017	21	0.9286	1034	0.5956	1039	0.9948	680
203	cloudwalk-mt-006	0.0006	10	0.0006	1	0.0023	74	0.0019	1	0.0016	12	0.0032	10	0.0030	22	0.0427	13
204	cloudwalk-mt-007	0.0006	9	0.0007	3	0.0023	80	0.0019	2	0.0016	10	0.0032	9	0.0030	20	0.0419	10
205	clova-000	0.0099	560	0.0150	554	0.0094	805	0.0147	812	0.0136	723	0.0213	461	0.0152	552	-	
206	cmcuni-001	0.0025	152	0.0038	150	0.0025	164	0.0025	121	0.0022	66	0.0052	88	0.0034	39	0.0660	128
207	codeline-000	0.0057	383	0.0079	378	0.0037	459	0.0053	486	0.2721	1099	1.0000	1175	0.9763	1137	1.0000	806
208	cogent-000	0.0435	848	0.0835	867	-		-		-		-		-		-	
209	cogent-001	0.0176	721	0.0385	773	-		-		-		-		-		-	
210	cogent-002	0.0148	678	0.0321	740	0.0095	810	0.0127	756	-		-		-		-	
211	cogent-003	0.0091	533	0.0188	624	0.0098	818	0.0132	769	0.0187	813	0.0319	550	0.0224	662	-	
212	cogent-004	0.0064	435	0.0116	498	0.0096	813	0.0134	777	0.0157	758	0.0325	556	0.0204	638	-	
213	cogent-005	0.0060	405	0.0112	489	0.0064	680	0.0070	588	0.0095	618	0.0184	427	0.0135	509	-	
214	cogent-006	0.0046	313	0.0059	290	0.0036	432	0.0047	429	0.0058	464	0.0113	312	0.0091	374	0.1522	349
215	cogent-007	0.0022	121	0.0038	149	0.0028	295	0.0031	226	0.0040	325	0.0082	204	0.0067	252	0.1395	325
216	cogent-008	0.0015	60	0.0027	82	0.0023	82	0.0025	112	0.0033	251	0.0063	130	0.0055	185	0.0884	214
217	cognitec-000	0.0116	610	0.0177	608	0.0118	882	0.0167	852	0.0285	908	0.9924	1094	0.0435	779	-	
218	cognitec-001	0.0126	640	0.0185	619	0.0120	886	0.0168	854	0.0270	894	0.0554	657	0.0357	749	-	
219	cognitec-002	0.0066	441	0.0101	461	0.0079	745	0.0108	715	0.0181	804	0.0317	548	0.0237	674	-	
220	cognitec-003	0.0038	259	0.0052	253	0.0054	619	0.0057	512	0.0225	856	0.0416	617	0.0388	761	0.1397	326

Table 57: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
221	cognitec-004	0.0036	246	0.0053	259	0.0053	607	0.0056	503	0.0098	633	0.0202	451	0.0154	553	0.3436	460
222	cognitec-005	0.0022	120	0.0030	105	0.0035	427	0.0041	371	0.0079	548	0.0480	638	0.0233	669	0.2134	407
223	cognitec-006	-		-		0.0034	416	0.0039	360	0.0069	507	0.0160	389	0.0108	438	0.1197	295
224	cognitec-007	-		-		0.0035	431	0.0042	392	0.0069	510	0.0114	315	0.0091	373	0.1112	279
225	compal-000	-		-		0.0028	302	0.0033	277	0.0039	313	0.0064	135	0.0051	156	0.0736	153
226	compal-001	-		-		0.0073	719	0.0053	481	0.0092	604	0.1965	795	0.0165	574	0.2610	435
227	cor-001	0.0075	482	0.0113	493	0.0055	627	0.0084	652	0.0091	600	0.0148	365	0.0092	382	-	
228	coretech-000	0.7699	1055	1.0000	1189	1.0000	1315	0.9999	1258	1.0000	1295	1.0000	1300	1.0000	1229	1.0000	1280
229	coretech-001	0.0052	352	0.0067	325	0.0083	768	0.0092	673	0.0346	932	0.1363	766	0.0252	687	0.6210	532
230	coretech-002	0.0020	102	0.0036	135	0.0064	682	0.0064	561	0.0118	684	0.0157	386	0.0110	443	0.3091	451
231	coretech-003	-		-		0.0045	549	0.0051	465	0.1155	1046	0.1539	775	0.1515	912	0.1180	289
232	coretech-004	-		-		0.0044	538	0.0048	438	0.0051	419	0.0093	250	0.0070	274	0.0893	218
233	corsight-001	0.0040	277	0.0057	278	0.0033	404	0.0047	428	0.0045	374	0.0095	258	0.0063	230	-	
234	corsight-002	0.0053	362	0.0068	331	0.0030	328	0.0041	383	0.0039	314	0.0079	189	0.0054	178	0.0747	160
235	corsight-003	0.0026	162	0.0040	169	0.0028	279	0.0045	419	0.0035	278	0.0059	117	0.0046	122	0.0637	112
236	csc-001	0.9158	1063	0.9346	1069	0.9899	1248	0.9993	1248	0.9999	1213	0.9959	1104	0.9906	1148	-	
237	csc-002	0.0099	563	0.0132	525	0.0077	736	0.0142	802	0.0126	698	0.0195	443	0.0146	540	-	
238	csc-003	0.0053	361	0.0065	313	0.0037	461	0.0047	432	0.0074	532	0.0124	331	0.0112	451	0.0928	242
239	ctbcbank-000	0.0168	706	0.0250	697	0.0146	931	0.0224	907	0.0211	845	0.8964	1020	0.3779	996	-	
240	ctbcbank-001	0.0155	688	0.0235	682	0.0148	938	0.0243	923	0.0207	840	0.9279	1033	0.3469	988	-	
241	ctbcbank-002	-		-		0.0031	339	0.0049	449	0.0037	293	0.7785	977	0.4878	1019	0.9727	642
242	cu-face-002	0.0105	583	0.0116	497	0.0650	1092	0.0568	1035	0.0271	898	0.0139	347	0.0076	311	0.1122	280
243	cu-face-003	0.0036	243	0.0049	233	0.0031	360	0.0037	334	0.0030	205	0.3075	848	0.1310	896	0.7046	546
244	cu-face-004	-		-		0.0032	380	0.0035	304	0.0026	151	0.4284	892	0.2115	943	0.7861	569
245	cubox-001	0.0064	429	0.0080	380	0.0037	454	0.0055	496	0.0060	469	0.0111	306	0.0077	320	-	
246	cubox-002	0.0034	232	0.0041	170	0.0025	157	0.0025	123	0.0033	250	0.0064	133	0.0058	206	0.0519	45
247	cubox-003	0.0021	111	0.0028	91	0.0024	146	0.0026	137	0.0025	125	0.0046	58	0.0037	59	0.0495	37
248	cubox-004	-		-		0.0025	181	0.0027	160	0.0023	83	0.0044	55	0.0038	62	0.0490	34
249	cubox-005	-		-		0.0026	214	0.0030	221	0.0025	117	0.0047	68	0.0039	74	0.0515	44
250	cudocommunication-001	0.4777	1026	1.0000	1091	0.4373	1181	0.5360	1173	1.0000	1257	1.0000	1360	1.0000	1299	1.0000	1124
251	cuhkee-001	0.0036	253	0.0045	209	0.0031	362	0.0046	424	0.0051	420	0.0095	259	0.0079	326	-	
252	cybercore-000	0.0728	893	0.1110	890	0.1521	1139	0.2375	1134	0.1874	1073	0.1907	792	0.1178	887	-	
253	cybercore-001	0.3759	1004	0.5677	1029	0.6928	1213	0.7926	1204	0.8118	1159	0.9291	1037	0.7080	1062	0.9782	649
254	cybercore-002	0.0092	540	0.0119	504	0.0049	579	0.0072	596	0.9105	1186	1.0000	1190	1.0000	1199	1.0000	811
255	cybercore-003	0.0155	687	0.0164	583	0.0032	384	0.0033	274	0.0024	92	0.9719	1060	0.8213	1086	0.9993	709
256	cyberextruder-001	0.1972	966	0.2547	954	0.4686	1186	0.6387	1184	0.3807	1115	0.3806	878	0.2582	957	-	
257	cyberextruder-002	0.0811	906	0.1336	902	0.1465	1138	0.2266	1133	0.2086	1084	1.0000	1308	1.0000	1245	-	
258	cyberextruder-003	0.0109	593	0.0169	593	0.0071	710	0.0112	725	0.0165	777	0.0410	615	0.0272	706	0.2308	415
259	cyberextruder-004	0.0118	616	0.0181	613	0.0081	756	0.0133	771	0.0191	822	0.0329	559	0.0268	704	0.1904	388
260	cyberextruder-005	-		-		0.0049	578	0.0063	554	0.0055	436	0.0105	289	0.0079	329	0.0806	191
261	cyberextruder-006	-		-		0.0083	764	0.0138	786	0.0100	641	0.0180	421	0.0114	458	0.1276	308
262	cyberlink-000	0.0181	726	0.0274	713	0.0125	897	0.0180	865	-		-		-		-	
263	cyberlink-001	0.0131	647	0.0210	651	0.0439	1065	0.0517	1028	0.0173	795	0.0333	567	0.0209	647	-	
264	cyberlink-002	0.0114	604	0.0195	633	0.0101	828	0.0163	845	0.0160	767	0.0302	536	0.0192	622	-	

Table 58: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

	Algorithm	FALSE NON-MATCH RATE (FNMR)																	
		CONSTRAINED, COOPERATIVE																LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER			
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06			
265	cyberlink-003	0.0118	615	0.0192	630	0.0098	821	0.0161	839	0.0153	751	0.0288	529	0.0159	563	-			
266	cyberlink-004	0.0074	477	0.0105	471	0.0068	698	0.0089	667	0.0094	614	0.0176	417	0.0117	465	-			
267	cyberlink-005	0.0060	406	0.0092	427	0.0058	646	0.0067	575	0.0074	528	0.0146	362	0.0105	431	-			
268	cyberlink-006	0.0042	289	0.0054	266	0.0043	528	0.0049	446	0.0052	425	0.0097	267	0.0077	321	-			
269	cyberlink-007	0.0032	210	0.0053	258	0.0041	510	0.0043	398	0.0052	424	0.0243	491	0.0084	355	0.3366	458		
270	cyberlink-008	0.0042	288	0.0056	277	0.0038	483	0.0048	439	0.0053	428	0.0099	273	0.0074	300	0.1354	322		
271	cyberlink-009	0.0018	88	0.0027	85	0.0047	558	0.0046	421	0.0040	329	0.0086	230	0.0062	227	0.1104	273		
272	cyberlink-010	0.0011	38	0.0019	43	0.0041	507	0.0041	372	0.0039	308	0.1829	788	0.0054	179	0.8629	589		
273	cyberlink-011	0.0010	27	0.0017	31	0.0035	426	0.0034	282	0.0045	366	0.0080	192	0.0070	277	0.0877	211		
274	cyberlink-012	0.0010	26	0.0016	29	0.0036	436	0.0035	308	0.0047	392	0.0099	272	0.0074	301	0.1350	320		
275	cyberlink-013	0.0011	36	0.0017	34	0.0037	456	0.0036	319	0.0045	368	0.0090	237	0.0080	333	0.0924	239		
276	cyberlink-014	-		-		0.0026	233	0.0027	145	0.0030	196	0.0065	139	0.0052	162	0.0869	208		
277	cyberlink-015	-		-		0.0025	165	0.0026	131	0.0028	173	0.0063	129	0.0050	148	0.0835	203		
278	dahua-000	0.0249	777	0.0477	804	-		-		-		-		-		-			
279	dahua-001	0.0250	782	0.0466	799	0.0228	998	0.0379	985	-		-		-		-			
280	dahua-002	0.0129	643	0.0157	573	0.0116	877	0.0153	822	0.0134	717	0.0222	473	0.0170	582	-			
281	dahua-003	0.0052	354	0.0068	327	0.0056	630	0.0062	549	0.0113	676	0.0207	455	0.0185	611	-			
282	dahua-004	0.0045	309	0.0058	280	0.0036	441	0.0048	437	0.0051	417	0.0086	226	0.0070	278	-			
283	dahua-005	0.0031	203	0.0046	216	0.0035	429	0.0049	454	0.0046	377	0.0076	174	0.0062	226	-			
284	dahua-006	0.0027	165	0.0039	159	0.0031	355	0.0039	358	0.0039	312	0.0067	150	0.0058	203	-			
285	dahua-007	0.0017	77	0.0023	58	0.0026	220	0.0032	247	0.0033	243	0.0060	119	0.0054	177	0.0678	134		
286	daon-000	0.0095	553	0.0117	500	0.0068	694	0.0077	625	0.0092	608	0.0174	413	0.0137	517	0.1430	335		
287	daon-001	-		-		0.0036	437	0.0058	516	0.0050	409	0.0084	212	0.0057	198	0.0805	189		
288	daon-002	-		-		0.0030	331	0.0042	389	0.0039	307	0.0146	363	0.0055	187	0.7444	556		
289	datech-000	0.0020	106	0.0031	109	0.0031	352	0.0041	380	0.0033	249	0.1646	780	0.0667	830	0.4898	499		
290	datech-001	-		-		0.0028	282	0.0034	288	0.0026	156	0.2308	817	0.0818	849	0.5505	509		
291	datech-002	-		-		0.0028	281	0.0034	290	0.0026	136	0.3779	876	0.1654	925	0.7940	572		
292	decatur-000	0.0714	890	0.1115	892	0.0608	1089	0.1106	1093	0.0866	1029	1.0000	1185	0.0714	836	-			
293	decatur-001	0.0424	844	0.0711	849	0.0237	1001	0.0458	1007	0.0447	970	1.0000	1164	0.9969	1163	1.0000	818		
294	decloakface-001	0.0795	902	0.1131	893	0.3127	1165	0.4259	1161	0.2118	1087	0.7926	981	0.6088	1041	0.9589	633		
295	decloakface-002	-		-		0.0048	568	0.0077	624	1.0000	1226	0.9998	1153	0.9997	1183	1.0000	802		
296	deepglint-001	0.0040	275	0.0062	301	0.0047	564	0.0067	574	0.0069	508	1.0000	1187	1.0000	1198	-			
297	deepglint-002	0.0016	67	0.0027	84	0.0032	370	0.0033	275	0.0043	352	0.0084	217	0.0077	318	-			
298	deepglint-003	0.0027	170	0.0038	154	0.0030	327	0.0032	245	0.0043	345	0.0082	205	0.0076	312	-			
299	deepglint-004	0.0025	147	0.0034	123	0.0039	492	0.0061	545	0.0050	411	0.0091	241	0.0082	342	0.1003	253		
300	deepglint-005	0.0052	350	0.0059	288	0.0030	320	0.0031	227	0.0033	255	0.7620	970	0.1535	913	0.9912	672		
301	deepsea-001	0.0136	657	0.0215	658	0.0142	923	0.0214	900	0.0163	771	0.0250	498	0.0192	623	-			
302	deepsense-000	0.0145	673	0.0265	709	0.0113	866	0.0196	887	0.0151	748	0.0215	464	0.0129	497	-			
303	deepsense-001	0.0013	47	0.0019	42	0.0024	136	0.0025	114	0.0027	165	0.0115	318	0.0053	168	0.1394	324		
304	deepsense-002	0.0010	29	0.0016	30	0.0024	99	0.0023	68	0.0026	141	0.0052	89	0.0043	106	0.0781	179		
305	deepsense-003	0.0009	25	0.0015	25	0.0025	177	0.0024	77	0.0023	82	0.0457	629	0.0097	400	0.2547	429		
306	deepsense-004	-		-		0.0023	59	0.0021	29	0.0020	47	0.0111	305	0.0040	92	0.1195	293		
307	deepsense-005	-		-		0.0023	57	0.0021	35	0.0019	36	0.0081	200	0.0035	48	0.0922	238		
308	deepsense-006	-		-		0.0022	40	0.0022	53	0.0018	28	0.0336	570	0.0059	210	0.2813	444		

Table 59: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)																	
	Algorithm	CONSTRAINED, COOPERATIVE																LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
309	deepsense-007	-		-		0.0022	42	0.0022	52	0.0018	27	0.0035	22	0.0030	23	0.0440	18
310	deepsense-008	-		-		0.0022	44	0.0022	55	0.0018	25	0.0034	21	0.0030	21	0.0434	15
311	dermalog-001	-		0.3049	971	-		-		-		-		-		-	
312	dermalog-002	-		0.3154	974	-		-		-		-		-		-	
313	dermalog-003	0.2355	976	0.2795	964	-		-		-		-		-		-	
314	dermalog-004	0.1810	959	0.2399	951	-		-		-		-		-		-	
315	dermalog-005	0.1526	947	0.1823	926	0.2580	1158	0.4018	1159	-		0.2651	834	0.1585	918	-	
316	dermalog-006	0.0253	784	0.0369	768	0.0171	959	0.0283	948	0.0217	851	0.0358	585	0.0230	665	-	
317	dermalog-007	0.0564	872	0.0798	862	0.1351	1135	0.2471	1136	0.2343	1093	0.2223	810	0.1397	903	-	
318	dermalog-008	0.0096	556	0.0166	588	0.0086	777	0.0133	770	0.0165	776	0.0586	669	0.0226	664	-	
319	dermalog-009	0.0067	444	0.0094	429	0.0051	596	0.0069	582	0.0116	683	0.0312	541	0.0177	598	0.3747	470
320	dermalog-010	0.0030	190	0.0041	171	0.0034	415	0.0037	338	0.0075	533	0.5181	910	0.2530	954	0.8853	604
321	dermalog-011	0.0045	308	0.0062	306	0.0035	428	0.0059	527	0.0057	458	0.2242	812	0.0407	768	0.6329	533
322	dermalog-012	0.0080	503	0.0101	462	0.0037	464	0.0057	513	0.0055	441	0.0095	260	0.0068	261	0.0834	202
323	dermalog-013	-		-		0.0036	443	0.0057	510	0.0058	461	0.0103	281	0.0073	291	0.0894	219
324	dermalog-014	-		-		0.0029	311	0.0039	359	0.0037	295	0.0069	156	0.0057	196	0.0646	117
325	dermalog-015	-		-		0.0025	170	0.0025	102	0.0033	241	0.0064	136	0.0054	180	0.0587	84
326	dicio-001	0.5486	1038	0.6442	1040	0.7516	1224	0.8607	1218	0.8678	1175	0.8268	996	0.7034	1059	0.9752	647
327	dicio-002	-		-		0.0057	639	0.0095	683	0.0097	632	0.9998	1150	0.9989	1172	1.0000	769
328	didiglobalface-001	0.0055	372	0.0092	424	0.0030	325	0.0045	418	0.0088	584	0.0119	325	0.0085	358	-	
329	didiglobalface-002	0.0033	223	0.0051	247	0.0026	221	0.0034	296	0.0033	248	0.0085	219	0.0047	130	0.1135	283
330	didiglobalface-003	-		-		0.0023	66	0.0025	122	0.0027	163	0.1115	743	0.0052	165	0.5374	507
331	digidata-000	0.0967	914	0.1410	909	0.2596	1159	0.3462	1153	0.0293	914	0.0363	593	0.0212	649	0.1849	386
332	digidata-001	0.0224	763	0.0352	757	0.0330	1038	0.0570	1037	0.0109	667	0.0481	639	0.0123	484	0.3055	450
333	digitalbarriers-000	0.3683	1003	0.4630	1006	-		-		-		-		-		-	
334	digitalbarriers-001	0.4683	1024	0.5024	1015	-		-		-		-		-		-	
335	digitalbarriers-002	0.3360	998	0.3690	988	0.0877	1111	0.1557	1111	0.0971	1039	0.0951	726	0.0497	798	-	
336	dps-000	0.0115	607	0.0176	605	0.0149	941	0.0185	874	0.0173	793	0.0275	519	0.0180	602	0.1757	376
337	dsk-000	0.1526	946	0.2169	942	0.3787	1174	0.5426	1175	0.3115	1106	0.3089	850	0.1994	938	-	
338	einetworks-000	0.0099	561	0.0180	611	0.0088	785	0.0140	796	0.0130	707	0.0225	478	0.0147	542	-	
339	einetworksindia-000	0.0058	390	0.0074	355	0.0051	595	0.0061	547	0.0074	529	0.0193	441	0.0102	418	0.1819	380
340	einetworksindia-001	0.0042	290	0.0062	302	0.0048	567	0.0064	559	0.0057	456	0.0473	636	0.0092	380	0.3984	480
341	einetworksindia-002	-		-		0.0024	124	0.0027	146	0.0023	75	0.1534	774	0.0513	802	0.4614	491
342	ekin-002	0.1168	929	0.2042	938	0.1530	1140	0.2524	1138	0.1777	1072	0.2773	839	0.1347	898	0.8954	612
343	element-000	0.0023	135	0.0035	133	0.0024	135	0.0026	128	0.0029	187	0.0060	122	0.0048	133	0.0631	108
344	enface-000	0.0028	178	0.0049	238	0.0043	533	0.0072	594	0.0058	465	0.0150	370	0.0090	372	0.7851	568
345	enface-001	0.0072	471	0.0107	477	0.0071	706	0.0138	787	0.0068	505	0.0515	649	0.0094	392	0.9942	678
346	enface-002	0.0033	225	0.0052	256	0.0038	479	0.0073	602	0.0026	155	0.9998	1155	0.9995	1179	1.0000	798
347	enqura-001	-		-		0.0155	947	0.0144	805	0.0312	924	0.0597	671	0.0485	795	0.2970	448
348	eocortex-000	0.3485	1000	0.6943	1048	0.1122	1124	0.1574	1112	0.2155	1088	0.2257	816	0.1606	922	-	
349	ercacat-001	0.0036	250	0.0044	199	0.0033	395	0.0047	433	0.0106	656	0.0202	450	0.0184	607	-	
350	euronovate-001	0.2786	985	0.3608	987	0.4489	1183	0.6105	1182	0.5010	1128	0.5392	917	0.3769	995	0.8802	600
351	euronovate-002	0.0256	787	0.0436	788	0.0226	996	0.0425	1000	0.0301	919	0.0691	695	0.0319	731	0.3687	466
352	euronovate-003	0.0061	415	0.0088	414	0.0040	505	0.0060	534	0.0065	497	0.7815	979	0.5034	1023	0.9823	653

Table 60: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
353	euronovate-004	0.0082	508	0.0110	483	0.0050	590	0.0077	623	0.0074	530	0.6949	954	0.3354	986	0.9791	651
354	everai-000	0.0122	625	0.0225	670	-		-		-		-		-		-	
355	everai-001	0.0085	518	0.0156	570	0.0072	716	0.0114	728	-		-		-		-	
356	everai-002	0.0104	581	0.0159	575	0.0063	675	0.0112	724	0.0182	806	0.0353	582	0.0264	701	-	
357	paravision-003	0.0034	233	0.0050	244	0.0036	447	0.0052	477	0.0092	607	0.0193	440	0.0156	557	-	
358	expasoft-000	0.0427	845	0.0655	842	0.0239	1003	0.0393	987	0.0673	1012	0.8963	1019	0.3832	998	-	
359	expasoft-001	0.0328	826	0.0488	808	0.0211	984	0.0342	969	0.0629	1007	0.6483	942	0.2816	968	-	
360	expasoft-002	0.0170	710	0.0274	714	0.0787	1105	0.0768	1062	0.1629	1064	0.9996	1143	0.9631	1130	1.0000	773
361	f8-001	0.0249	779	0.0336	747	0.0178	962	0.0232	916	0.0303	920	0.0615	677	0.0408	769	-	
362	f8-002	0.0340	828	0.0591	833	0.0213	986	0.0374	983	0.0452	971	0.0760	704	0.0502	801	0.2708	438
363	facehawk-000	1.0000	1191	1.0000	1170	1.0000	1304	1.0000	1294	1.0000	1294	1.0000	1314	1.0000	1249	1.0000	1269
364	facelocate-001	-		-		0.0664	1095	0.1171	1096	0.0950	1036	0.9219	1029	0.7041	1060	0.9985	699
365	faceonlive-001	0.0269	794	0.0359	763	0.0387	1051	0.0721	1058	0.0246	884	0.0349	579	0.0220	655	0.2408	420
366	faceonlive-002	0.0121	622	0.0135	530	0.0033	399	0.0041	375	0.0037	297	0.9427	1042	0.7927	1081	0.9993	707
367	faceonlive-003	-		-		0.0045	546	0.0050	460	0.0193	828	0.0360	589	0.0356	747	0.1320	310
368	facephi-000	0.0044	301	0.0059	282	0.0047	560	0.0057	514	0.0088	590	1.0000	1202	1.0000	1204	1.0000	816
369	facephi-001	-		-		0.0031	357	0.0037	333	0.0058	463	0.0111	303	0.0098	404	0.1048	263
370	facephi-002	-		-		0.0024	100	0.0022	49	0.0036	284	0.0093	249	0.0070	271	0.1136	284
371	facesoft-000	0.0085	516	0.0112	491	0.0064	678	0.0107	712	0.0091	599	0.0171	409	0.0107	434	-	
372	facetag-000	0.2836	986	0.4081	997	0.2933	1162	0.4303	1162	0.3448	1110	0.6312	937	0.3530	989	0.9753	648
373	facetag-001	0.2920	988	0.4538	1003	0.3220	1167	0.4371	1163	1.0000	1330	1.0000	1264	0.3254	982	1.0000	867
374	facetag-002	0.0098	559	0.0147	550	0.0064	683	0.0110	720	0.0116	681	0.0190	437	0.0119	474	0.1334	316
375	facex-001	1.0000	1154	1.0000	1181	1.0000	1261	1.0000	1261	1.0000	1302	1.0000	1295	1.0000	1214	-	
376	facex-002	0.0803	904	0.1404	907	0.1283	1132	0.1979	1128	0.1440	1057	0.1952	794	0.1299	894	0.7427	554
377	facia-001	0.0083	512	0.0124	510	0.0064	681	0.0097	688	0.0098	634	0.9983	1122	0.9849	1142	1.0000	789
378	facia-002	-		-		0.0072	715	0.0109	718	0.0122	691	0.0460	630	0.0135	510	0.4464	489
379	faicetech-000	-		-		0.0026	235	0.0031	231	0.0023	84	0.0116	320	0.0037	57	0.0904	226
380	farfaces-001	0.4890	1031	0.5860	1035	0.5650	1194	0.7268	1194	0.8015	1158	0.7511	966	0.5892	1037	0.9536	629
381	fastenterprises-000	0.0093	542	0.0151	560	0.0098	819	0.0140	797	0.0209	842	0.2991	844	0.1608	923	0.6727	539
382	fci-000	-		-		0.0027	246	0.0027	154	0.0028	174	0.1269	758	0.0563	815	0.3886	475
383	fdu-000	0.0386	838	0.0576	829	-		-		-		-		-		-	
384	fdu-001	0.0347	831	0.0439	792	-		-		-		-		-		-	
385	fedu-001	-		-		0.0033	389	0.0047	427	0.0128	701	0.9816	1069	0.9216	1111	0.9999	730
386	fiberhome-nanjing-002	0.0217	758	0.0381	771	0.0874	1110	0.1770	1119	0.0271	897	0.0351	581	0.0188	615	-	
387	fiberhome-nanjing-003	0.0090	528	0.0139	537	0.0082	761	0.0144	804	0.0110	669	0.0174	411	0.0107	436	-	
388	fiberhome-nanjing-004	0.0037	258	0.0056	276	0.0031	351	0.0043	399	0.0043	354	0.0083	211	0.0061	223	-	
389	fincore-000	0.0309	815	0.0502	810	0.0281	1021	0.0510	1026	0.0521	988	0.0815	711	0.0522	804	0.3100	452
390	firstcreditkz-001	0.0024	146	0.0034	122	0.0024	142	0.0024	99	0.0034	256	1.0000	1222	1.0000	1313	1.0000	1023
391	firstcreditkz-002	0.0018	89	0.0026	77	0.0024	128	0.0024	87	0.0029	194	0.0056	100	0.0049	139	0.0624	101
392	firstcreditkz-003	-		-		0.0023	87	0.0024	92	0.0026	146	0.0104	287	0.0047	127	0.0910	231
393	firstcreditkz-004	-		-		0.0023	73	0.0024	79	0.0024	94	0.0360	590	0.0061	222	0.2315	416
394	foomobi-001	0.4827	1029	0.5795	1031	0.6823	1209	0.8132	1208	0.8217	1164	1.0000	1309	1.0000	1254	1.0000	1273
395	foomobi-002	0.4827	1028	0.5795	1030	0.6823	1208	0.8132	1207	0.8217	1163	1.0000	1336	1.0000	1259	1.0000	1213
396	fourthlinecom-001	-		-		0.0442	1066	0.0696	1054	0.0609	1000	0.8783	1011	0.7523	1072	0.9917	673

Table 61: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)																	
		CONSTRAINED, COOPERATIVE																LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER			
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06			
397	fpt-000	-		-		0.0213	987	0.0375	984	0.0364	941	0.9528	1046	0.8729	1096	0.9993	710		
398	fpt-001	-		-		0.0099	822	0.0148	813	0.8158	1161	0.9986	1125	0.9934	1152	1.0000	817		
399	fraudcom-000	0.0110	595	0.0173	597	0.0083	765	0.0139	792	0.0166	778	0.0258	508	0.0177	595	0.1488	345		
400	frpkauai-001	0.0023	128	0.0035	132	0.0026	195	0.0030	220	0.0040	327	0.0080	196	0.0072	286	0.0706	143		
401	frpkauai-002	0.0024	142	0.0035	124	0.0024	139	0.0024	95	0.0033	253	0.0065	142	0.0058	207	0.0599	87		
402	frpkauai-003	-		-		0.0023	81	0.0023	72	0.0024	87	0.0075	170	0.0039	75	0.0762	169		
403	frpkauai-004	-		-		0.0037	453	0.0036	326	0.0069	509	0.0226	479	0.0138	518	0.1354	321		
404	fujitsulab-000	0.0123	628	0.0212	654	0.0091	791	0.0133	773	0.0251	886	0.4200	890	0.0360	753	-			
405	fujitsulab-001	0.0059	401	0.0082	389	0.0132	908	0.0258	931	0.0140	731	0.0246	495	0.0142	529	-			
406	fujitsulab-002	0.0091	538	0.0124	512	0.0105	839	0.0156	825	0.0169	786	0.0345	577	0.0146	541	-			
407	fujitsulab-003	0.0045	306	0.0065	314	0.0057	641	0.0083	649	0.0080	556	0.0154	379	0.0101	410	0.5564	511		
408	g42-intellibrain-001	0.0006	8	0.0009	10	0.0037	457	0.0044	408	0.0030	213	0.0059	115	0.0053	174	0.0750	166		
409	g42-intellibrain-002	0.0006	11	0.0011	12	0.0029	303	0.0037	336	0.0028	170	0.0212	459	0.0091	375	0.1398	328		
410	geo-000	0.0543	866	0.0814	864	0.1042	1120	0.1592	1113	0.1637	1065	0.8533	1005	0.1800	930	-			
411	geo-001	0.0180	725	0.0198	642	0.0037	458	0.0055	494	0.0070	512	0.0129	338	0.0094	388	-			
412	geo-002	0.0171	713	0.0187	623	0.0035	422	0.0051	470	0.0064	489	0.0117	322	0.0083	351	0.0938	244		
413	geo-003	0.0180	724	0.0313	735	0.0239	1005	0.0552	1030	0.0319	927	0.0487	642	0.0222	658	0.1962	398		
414	geo-004	0.0030	188	0.0041	174	0.0025	178	0.0030	203	0.0035	277	0.0065	140	0.0053	173	0.0648	119		
415	gistouch-000	0.0296	808	0.0518	815	0.0342	1043	0.0609	1041	0.0493	980	1.0000	1201	1.0000	1213	1.0000	821		
416	gistouch-001	0.0176	720	0.0312	734	0.8931	1239	0.9735	1237	0.8625	1171	1.0000	1349	1.0000	1288	1.0000	1165		
417	glory-000	0.1094	925	0.1286	898	0.2179	1152	0.2656	1141	-		-		-		-			
418	glory-001	0.0902	910	0.1082	888	0.1642	1142	0.2065	1132	0.2186	1089	0.2669	835	0.2089	941	-			
419	glory-002	0.0241	769	0.0311	733	0.0116	878	0.0151	820	0.0157	760	0.0264	510	0.0188	617	-			
420	glory-003	0.0076	487	0.0125	514	0.0077	739	0.0103	706	0.0130	706	0.0205	452	0.0143	532	-			
421	glory-004	0.0077	488	0.0123	508	0.0074	729	0.0098	696	0.0122	694	0.0193	439	0.0134	507	0.1520	348		
422	glory-005	0.0056	376	0.0076	363	0.0054	620	0.0072	597	0.0075	534	0.9237	1031	0.7853	1078	0.9974	695		
423	glory-006	0.0050	332	0.0068	326	0.0051	598	0.0070	587	0.0069	511	0.7869	980	0.5076	1024	0.9719	641		
424	glory-007	0.0050	341	0.0068	330	0.0050	589	0.0069	584	0.0068	502	0.0126	336	0.0083	350	0.1066	264		
425	gorilla-000	0.0802	903	0.1409	908	-		-		-		-		-		-			
426	gorilla-001	0.0488	857	0.0756	855	0.1218	1130	0.2034	1130	-		-		-		-			
427	gorilla-002	0.0256	788	0.0413	779	0.0478	1071	0.0912	1080	-		-		-		-			
428	gorilla-003	0.0165	704	0.0291	720	0.0205	981	0.0437	1001	0.0297	917	0.9658	1056	0.0262	696	-			
429	gorilla-004	0.0138	662	0.0239	686	0.0243	1007	0.0444	1003	0.0275	903	0.0369	596	0.0204	641	-			
430	gorilla-005	-		-		0.0142	924	0.0267	941	0.0228	860	0.0358	584	0.0195	628	-			
431	gorilla-006	0.0105	587	0.0152	561	0.0106	842	0.0203	893	0.0155	753	0.0218	468	0.0136	511	-			
432	gorilla-007	0.0074	480	0.0111	487	0.0065	686	0.0126	751	0.0100	644	0.0151	372	0.0102	414	0.1450	339		
433	gorilla-008	0.0058	396	0.0091	421	0.0049	577	0.0079	637	0.0079	553	0.0126	335	0.0091	376	0.1217	300		
434	gorilla-009	0.0049	326	0.0072	344	0.0038	474	0.0056	504	0.0065	493	0.0104	283	0.0070	272	0.1103	272		
435	gpstechvn-000	0.0202	747	0.0355	760	0.0142	922	0.0248	925	0.0208	841	0.0495	644	0.0207	644	0.5098	503		
436	graymatics-001	0.1039	919	0.1620	918	0.1344	1134	0.1917	1124	0.1648	1066	0.5160	908	0.2689	963	0.9194	621		
437	griaule-000	0.0071	466	0.0099	451	0.0050	584	0.0072	593	0.0160	764	0.0304	537	0.0267	703	0.1480	343		
438	griaule-001	0.0057	384	0.0078	374	0.0045	550	0.0065	565	0.0070	515	0.7515	967	0.5106	1025	0.9747	645		
439	griaule-002	0.0021	114	0.0032	112	0.0025	189	0.0027	161	0.0034	266	0.0996	732	0.0201	635	0.3978	478		
440	gtelots-000	-		-		0.0059	648	0.0098	692	0.0090	596	0.9995	1140	0.9975	1164	1.0000	778		

Table 62: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
441	hertasecurity-000	0.0630	880	0.0780	861	0.0503	1077	0.0898	1075	0.0738	1015	0.0693	698	0.0420	774	-	
442	hertasecurity-001	0.0249	781	0.0309	732	0.0105	840	0.0161	838	0.0245	882	0.0447	624	0.0359	751	0.1850	387
443	hertasecurity-002	0.0206	750	0.0315	736	0.0060	655	0.0078	631	0.0253	889	0.0696	699	0.0457	785	0.4565	490
444	hertasecurity-003	0.0079	501	0.0104	468	0.0060	656	0.0078	627	0.0255	890	0.0732	702	0.0460	786	0.4731	493
445	hik-001	0.0096	555	0.0125	515	0.0093	799	0.0164	848	0.0108	663	0.0937	722	0.0127	491	-	
446	hisign-001	0.0036	251	0.0050	241	0.0034	406	0.0046	422	0.0079	552	0.0153	378	0.0133	504	0.1080	266
447	hisign-002	0.0029	183	0.0044	203	0.0027	269	0.0032	259	0.0028	180	0.0409	614	0.0132	502	0.2016	402
448	hisign-003	-		-		0.0030	323	0.0036	317	0.0036	287	0.0582	667	0.0201	636	0.2584	431
449	hyperverge-001	1.0000	1313	1.0000	1305	1.0000	1359	1.0000	1349	1.0000	1360	1.0000	1234	1.0000	1328	-	
450	hyperverge-002	0.0050	335	0.0066	320	0.0035	421	0.0051	464	0.0062	483	0.0107	294	0.0074	302	0.0921	237
451	hyperverge-003	0.0019	97	0.0030	100	0.0025	160	0.0029	193	0.0027	158	0.0049	84	0.0042	102	0.0576	76
452	hyperverge-004	0.0072	472	0.0116	499	0.0040	499	0.0071	592	0.0058	462	0.0080	194	0.0057	199	0.0621	99
453	hyperverge-005	0.0026	164	0.0039	164	0.0027	244	0.0031	240	0.0036	289	0.0066	144	0.0055	184	0.0658	126
454	hyperverge-006	-		-		0.0025	186	0.0030	208	0.0033	247	0.0060	121	0.0051	158	0.0601	88
455	hyundai-roboticslab-000	-		-		0.0037	455	0.0052	474	0.0063	487	1.0000	1240	0.0872	856	1.0000	943
456	hyundai-roboticslab-001	-		-		0.0048	575	0.0066	571	0.0193	826	0.8620	1006	0.6861	1054	0.9861	663
457	hyundai-roboticslab-002	-		-		0.0039	497	0.0054	489	0.0086	579	0.9589	1049	0.8817	1101	0.9986	701
458	hyundai-roboticslab-003	-		-		0.0024	104	0.0028	168	0.0027	166	0.6384	940	0.2934	972	0.8692	592
459	hzailu-001	0.0122	623	0.0164	584	0.0095	809	0.0196	885	0.0079	550	0.0118	323	0.0090	370	0.1173	288
460	hzailu-002	0.0051	344	0.0072	343	0.0038	484	0.0055	499	0.0040	324	0.0077	175	0.0062	228	0.0928	243
461	hzailu-003	0.0178	722	0.0291	719	0.0031	366	0.0042	395	0.0035	268	0.0061	126	0.0052	160	0.0799	187
462	hzailu-004	0.0175	718	0.0197	639	0.0031	368	0.0042	391	0.0034	264	0.0060	123	0.0051	151	0.0775	177
463	hzailu-005	0.0172	715	0.0197	638	0.0028	293	0.0036	322	0.0032	238	0.0058	106	0.0048	134	0.0751	167
464	hzailu-006	0.0161	699	0.0174	599	0.0024	132	0.0027	141	0.0026	147	0.0049	83	0.0044	116	0.0654	123
465	hzailu-007	-		-		0.0025	155	0.0027	157	0.0026	137	0.0048	74	0.0044	113	0.0653	122
466	hzailu-008	-		-		0.0024	149	0.0026	140	0.0025	131	0.0048	72	0.0044	111	0.0652	121
467	i2v-001	-		-		0.0946	1115	0.1369	1103	0.3989	1120	0.9998	1151	0.9966	1160	1.0000	777
468	i2v-002	-		-		0.0035	425	0.0044	412	0.0037	292	0.9355	1040	0.4823	1017	0.9960	685
469	icm-002	0.0143	670	0.0249	695	0.0144	929	0.0256	930	0.0236	874	0.0386	607	0.0263	700	-	
470	icm-003	0.0138	661	0.0222	666	0.0149	939	0.0282	947	0.0227	859	0.0384	605	0.0257	691	0.1938	393
471	icm-004	0.0079	500	0.0120	505	0.0074	726	0.0107	711	0.0091	601	0.0281	524	0.0128	495	0.2778	442
472	icm-005	0.0100	566	0.0140	539	0.0091	788	0.0108	713	0.0169	785	0.0319	551	0.0290	720	0.1775	379
473	icomm-000	0.0019	99	0.0033	119	0.0033	398	0.0044	409	0.0031	229	0.1350	764	0.0552	812	0.4196	483
474	icthtc-000	0.0260	790	0.0396	777	0.0207	982	0.0339	968	0.0291	913	0.0474	637	0.0346	742	-	
475	id3-001	0.1698	953	0.2499	953	-		-		-		-		-		-	
476	id3-002	0.1615	952	0.2393	950	-		-		-		-		-		-	
477	id3-003	0.0361	835	0.0757	857	0.0292	1027	0.0476	1015	0.0447	969	0.0674	690	0.0396	764	-	
478	id3-004	0.0198	744	0.0344	754	0.0238	1002	0.0423	999	0.0289	912	0.0416	616	0.0257	690	-	
479	id3-005	0.0104	578	0.0169	592	0.0080	754	0.0133	774	0.0194	829	0.0334	568	0.0262	697	-	
480	id3-006	0.0072	473	0.0103	466	0.0049	580	0.0074	607	0.0095	616	0.0165	400	0.0119	473	-	
481	id3-007	0.0056	377	0.0078	371	0.0060	659	0.0072	601	0.0275	901	0.1374	768	0.0519	803	-	
482	id3-008	0.0039	265	0.0055	271	0.0032	382	0.0042	388	0.0081	561	0.0155	381	0.0134	505	0.1186	291
483	idemia-003	0.0222	760	0.0316	737	0.0188	965	0.0325	965	0.0548	992	-		-		-	
484	idemia-004	0.0160	698	0.0244	690	0.0199	975	0.0354	974	0.0268	892	0.1489	773	0.0263	699	-	

Table 63: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
485	idemia-005	0.0132	650	0.0216	660	0.0121	888	0.0218	904	0.0215	848	0.0323	555	0.0188	616	-	
486	idemia-006	0.0046	319	0.0062	307	0.0047	562	0.0066	567	0.0073	525	0.2882	841	0.0094	393	-	
487	idemia-007	0.0024	139	0.0039	163	0.0032	387	0.0038	347	0.0046	379	0.0092	246	0.0070	279	-	
488	idemia-008	0.0023	130	0.0032	114	0.0023	91	0.0028	163	0.0034	267	0.0067	149	0.0056	194	0.0765	171
489	idemia-009	0.0022	124	0.0030	102	0.0022	49	0.0023	74	0.0023	74	0.0046	59	0.0039	70	0.0533	52
490	idemia-010	0.0015	63	0.0026	71	0.0022	53	0.0020	7	0.0020	45	0.0040	36	0.0033	33	0.0465	25
491	idemia-011	-		-		0.0021	22	0.0021	30	0.0018	31	0.0077	180	0.0038	63	0.0782	182
492	identy-000	0.0073	474	0.0095	438	0.0050	585	0.0067	572	0.0071	518	0.8257	995	0.4310	1009	0.9839	658
493	identy-001	-		-		0.0029	310	0.0034	278	0.0037	298	0.0066	145	0.0055	186	0.0748	165
494	identy-002	-		-		0.0027	252	0.0029	202	0.0030	197	0.0058	107	0.0051	153	0.0691	138
495	idrnd-000	-		-		0.0041	517	0.0053	485	0.0050	406	0.0094	252	0.0075	303	0.1026	257
496	idrnd-001	-		-		0.0025	190	0.0033	270	0.0032	234	0.0528	654	0.0173	590	0.2243	411
497	igearx-face-000	0.0091	532	0.0146	547	0.0163	954	0.0362	979	0.0399	952	0.6436	941	0.3305	984	0.7832	567
498	iit-000	0.1516	945	0.1981	935	0.0828	1108	0.1442	1108	0.2214	1090	0.2943	842	0.1877	933	-	
499	iit-001	0.0104	577	0.0179	610	0.0099	825	0.0142	801	0.1222	1048	0.2677	836	0.2171	946	-	
500	iit-002	0.0111	599	0.0177	609	0.0085	773	0.0140	795	0.0193	825	0.0332	565	0.0260	693	-	
501	iit-003	0.0082	510	0.0151	559	0.0053	609	0.0084	653	0.0122	693	0.0199	448	0.0137	516	-	
502	imds-software-001	0.0126	639	0.0228	672	0.0130	904	0.0221	906	0.0231	862	0.0469	635	0.0199	634	0.4260	485
503	imds-software-002	0.0048	324	0.0072	347	0.0036	439	0.0052	478	0.0047	390	0.9981	1120	0.0078	324	1.0000	779
504	imds-software-003	0.0032	205	0.0047	223	0.0028	275	0.0036	324	0.0036	288	0.9987	1126	0.0063	231	1.0000	771
505	imperial-000	0.0067	445	0.0108	480	0.0080	752	0.0134	778	0.0087	581	0.0581	666	0.0102	419	-	
506	imperial-001	0.0094	549	0.0154	566	0.0072	714	0.0120	737	0.0103	648	0.0190	435	0.0120	477	-	
507	imperial-002	0.0058	389	0.0081	385	0.0055	625	0.0085	656	0.0083	567	0.0157	383	0.0103	420	-	
508	incode-000	0.0766	896	0.1029	887	-		-		-		-		-		-	
509	incode-001	0.0550	869	0.0773	859	-		-		-		-		-		-	
510	incode-002	0.0293	805	0.0548	825	0.0436	1064	0.0785	1064	-		-		-		-	
511	incode-003	0.0142	669	0.0249	696	0.0448	1067	0.0869	1071	0.0354	936	0.0661	685	0.0320	732	-	
512	incode-004	0.0077	490	0.0132	524	0.0096	814	0.0160	835	0.0171	789	0.0281	522	0.0179	600	-	
513	incode-005	0.0111	600	0.0189	625	0.0156	949	0.0304	956	0.0195	832	0.0307	540	0.0172	586	-	
514	incode-006	0.0156	689	0.0273	712	0.0117	879	0.0238	921	0.0202	837	0.0339	574	0.0164	572	-	
515	incode-007	0.0109	592	0.0155	568	0.0056	634	0.0099	697	0.0107	658	0.0168	404	0.0102	415	-	
516	incode-008	0.0063	424	0.0101	458	0.0046	555	0.0086	662	0.0057	454	0.0104	284	0.0074	296	-	
517	incode-009	0.0044	300	0.0067	324	0.0034	411	0.0051	463	0.0049	404	0.0091	240	0.0067	255	0.0892	217
518	incode-010	0.0041	281	0.0063	310	0.0028	296	0.0043	397	0.0047	393	0.0077	182	0.0061	221	0.0770	175
519	incode-011	0.0032	204	0.0044	200	0.0026	227	0.0034	291	0.0032	230	0.0359	586	0.0140	524	0.1840	385
520	incode-012	0.0027	166	0.0043	189	0.0025	163	0.0035	305	0.0034	261	0.0966	730	0.0385	759	0.3387	459
521	incode-013	0.0035	240	0.0049	230	0.0032	373	0.0039	357	0.0051	413	0.0094	253	0.0081	340	0.0768	173
522	incode-014	-		-		0.0022	50	0.0023	69	0.0034	260	0.0066	147	0.0062	229	0.0569	73
523	incode-015	-		-		0.0021	10	0.0022	54	0.0020	48	0.0040	38	0.0037	55	0.0537	56
524	infocert-001	0.0105	585	0.0172	596	0.0078	741	0.0125	748	0.0159	762	0.1573	777	0.0565	816	0.5716	515
525	innefulabs-000	0.0122	626	0.0199	643	0.0112	863	0.0197	888	0.0222	854	0.0372	600	0.0271	705	-	
526	innominds-001	0.5569	1039	0.6541	1042	0.7642	1228	0.8665	1221	0.7629	1149	0.8200	991	0.6359	1047	0.9841	660
527	innov8tif-000	-		-		0.1842	1145	0.3028	1150	0.2056	1082	0.2348	821	0.1449	906	0.6142	528
528	innovativetechnologyltd-001	0.0578	873	0.0938	880	0.0501	1076	0.0981	1082	0.0592	999	0.0779	709	0.0422	775	-	

Table 64: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
529	innovativetechnologyltd-002	0.0451	851	0.0716	851	0.0541	1083	0.1009	1086	0.0506	983	0.0682	692	0.0371	756	-	
530	innovatrics-000	0.1105	926	0.1905	931	-		-		-		-		-		-	
531	innovatrics-001	0.1077	924	0.1828	928	-		-		-		-		-		-	
532	innovatrics-002	0.4049	1009	0.6142	1037	-		-		-		-		-		-	
533	innovatrics-003	0.0349	832	0.0483	806	-		-		-		-		-		-	
534	innovatrics-004	0.0194	740	0.0292	721	0.0344	1044	0.0617	1042	0.0562	994	0.0762	705	0.0412	770	-	
535	innovatrics-005	0.0230	766	0.0353	758	0.0398	1055	0.0721	1059	-		-		-		-	
536	innovatrics-006	0.0058	391	0.0089	417	0.0061	666	0.0096	686	0.0096	626	0.0165	401	0.0103	421	-	
537	innovatrics-007	0.0040	271	0.0054	265	0.0057	636	0.0078	626	0.0079	551	0.0123	328	0.0088	366	-	
538	innovatrics-008	0.0047	322	0.0064	312	0.0038	481	0.0052	476	0.0053	429	0.0088	232	0.0069	269	0.0899	223
539	innovatrics-009	0.0022	119	0.0031	111	0.0028	274	0.0032	256	0.0034	259	0.1165	748	0.0326	733	0.3866	474
540	innovatrics-010	0.0017	82	0.0031	110	0.0027	264	0.0028	167	0.0041	332	0.0078	184	0.0066	251	0.0744	158
541	innovatrics-011	-		-		0.0026	228	0.0027	144	0.0032	236	0.0060	118	0.0044	112	0.0615	97
542	innovatrics-012	-		-		0.0025	167	0.0026	125	0.0034	263	0.9309	1038	0.4977	1020	0.9960	684
543	innovatrics-013	-		-		0.0022	33	0.0021	32	0.0026	138	0.9984	1123	0.3780	997	1.0000	775
544	innovatrics-014	-		-		0.0021	18	0.0020	5	0.0017	19	0.0033	14	0.0029	12	0.0417	9
545	innovatrics-015	-		-		0.0021	9	0.0020	16	0.0019	39	0.0036	25	0.0031	25	0.0468	26
546	innovatrics-016	-		-		0.0021	12	0.0020	17	0.0018	24	0.0034	19	0.0029	15	0.0451	21
547	insightface-000	0.0018	90	0.0027	83	0.0029	304	0.0030	223	0.0038	303	0.0077	179	0.0068	259	0.0765	170
548	insightface-001	0.0009	18	0.0014	19	0.0027	247	0.0024	97	0.0035	276	0.0070	158	0.0065	241	0.0692	139
549	insightface-002	0.0011	35	0.0019	40	0.0027	263	0.0026	130	0.0036	286	0.0069	154	0.0065	240	0.0694	140
550	insightface-003	0.0015	59	0.0021	48	0.0045	548	0.0034	295	0.1298	1050	1.0000	1333	0.9407	1117	1.0000	1205
551	insightface-004	0.0015	64	0.0023	57	0.0052	604	0.0036	323	0.1403	1055	0.9923	1093	0.9128	1107	0.9989	702
552	inspur-000	0.0060	411	0.0078	369	0.7415	1223	0.9093	1230	0.2838	1102	0.9996	1141	0.9976	1165	1.0000	807
553	inspur-001	0.0035	238	0.0049	232	0.0025	166	0.0030	212	0.0029	192	0.9951	1101	0.9592	1127	1.0000	757
554	inspur-002	0.0025	149	0.0039	161	0.0024	102	0.0027	143	0.0031	217	0.0062	128	0.0047	128	0.1112	276
555	inspur-003	-		-		0.0023	77	0.0026	134	0.0031	219	0.0060	120	0.0046	123	0.0812	195
556	intellicloudai-001	0.0142	668	0.0234	680	0.0092	795	0.0145	807	0.0162	769	0.0371	599	0.0171	585	-	
557	intellicloudai-002	0.0059	400	0.0085	400	0.0060	657	0.0069	585	0.0108	661	0.2477	829	0.0171	584	-	
558	intellifusion-001	0.0072	469	0.0094	437	0.0056	635	0.0085	657	0.0111	672	0.0212	460	0.0143	531	-	
559	intellifusion-002	0.0059	398	0.0077	365	0.0040	500	0.0074	606	0.0085	575	0.5352	916	0.0104	428	-	
560	intellivision-001	0.1335	938	0.2205	945	0.1090	1122	0.1670	1115	0.1385	1052	0.1676	782	0.1170	884	-	
561	intellivision-002	0.1000	915	0.1775	922	0.0610	1090	0.1009	1085	0.0805	1024	0.1074	738	0.0682	831	-	
562	intellivision-003	0.1177	931	0.2006	937	0.0760	1102	0.1244	1100	0.1069	1044	0.1431	771	0.0839	850	0.4940	501
563	intellivision-004	0.0271	796	0.0559	826	0.0294	1031	0.0503	1025	0.0327	928	0.0461	631	0.0293	724	0.2860	446
564	intellivision-005	0.0105	586	0.0182	616	0.0093	801	0.0141	798	0.0146	743	0.0252	500	0.0172	588	0.1763	378
565	intellivision-006	0.0111	601	0.0174	601	0.0110	855	0.0162	840	0.0181	802	0.0313	542	0.0191	620	0.2416	422
566	intellivision-007	0.0086	519	0.0128	520	0.0098	820	0.0159	833	0.0133	714	0.0218	469	0.0154	554	0.1751	375
567	intellivix-001	0.0064	434	0.0087	413	0.0046	553	0.0063	557	0.0072	519	0.9233	1030	0.7856	1079	0.9977	697
568	intellivix-002	0.0062	419	0.0085	401	0.0039	489	0.0056	502	0.0060	475	0.3464	863	0.0857	854	0.8759	595
569	intellivix-003	0.0075	483	0.0125	516	0.0052	603	0.0091	672	0.0066	499	0.0297	532	0.0096	399	0.1907	390
570	intellivix-004	0.0032	212	0.0045	211	0.0025	183	0.0031	239	0.0040	321	0.0074	167	0.0063	232	0.0662	129
571	intellivix-005	0.0034	231	0.0048	225	0.0024	110	0.0027	159	0.0035	275	0.0067	148	0.0059	219	0.0609	93
572	intellivix-006	-		-		0.0024	148	0.0030	218	0.0026	139	0.0085	218	0.0040	83	0.0918	234

Table 65: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.			
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
573	intelresearch-000	0.0307	814	0.0578	830	0.0385	1049	0.0751	1061	0.0409	957	0.9870	1077	0.5380	1030	-	
574	intelresearch-001	0.0242	772	0.0595	834	0.0129	903	0.0292	952	0.0351	934	0.9993	1132	0.1854	932	-	
575	intelresearch-002	0.0058	395	0.0082	392	0.0050	592	0.0086	659	0.0136	722	0.0434	618	0.0216	653	-	
576	intelresearch-003	0.0046	317	0.0062	300	0.0038	477	0.0060	535	0.0088	586	0.0168	406	0.0136	512	-	
577	intelresearch-004	0.0025	150	0.0035	128	0.0032	376	0.0038	342	0.0049	405	0.0094	251	0.0072	284	-	
578	intelresearch-005	0.0016	68	0.0023	59	0.0028	273	0.0034	285	0.0042	344	0.0084	213	0.0066	249	0.1433	336
579	intelresearch-006	0.0010	30	0.0015	24	0.0026	242	0.0028	177	0.0032	235	0.8123	988	0.4742	1015	0.9907	669
580	intelresearch-007	0.0009	21	0.0013	15	0.0025	162	0.0025	104	0.0035	272	0.0069	155	0.0057	195	0.0746	159
581	intelresearch-008	0.0009	19	0.0013	14	0.0025	161	0.0025	103	0.0028	177	0.0304	538	0.0048	135	0.2375	419
582	intelresearch-009	-		-		0.0024	150	0.0025	109	0.0028	179	0.0058	110	0.0046	124	0.0665	130
583	intelresearch-010	-		-		0.0023	84	0.0024	81	0.0029	193	0.0058	111	0.0050	146	0.0683	137
584	intelresearch-011	-		-		0.0023	60	0.0023	57	0.0025	121	0.0049	81	0.0040	90	0.0549	62
585	intelresearch-012	-		-		0.0023	72	0.0023	63	0.0025	113	0.0048	75	0.0040	88	0.0549	61
586	intema-000	0.0012	43	0.0017	35	0.0023	55	0.0022	50	0.0022	67	0.0172	410	0.0061	220	0.0996	252
587	intema-001	0.0010	31	0.0014	21	0.0021	16	0.0020	18	0.0019	41	0.0037	27	0.0030	24	0.0457	23
588	interlinklabs-001	-		-		0.0102	831	0.0205	895	0.0195	831	0.0237	487	0.0115	462	0.1579	353
589	interlinklabs-002	-		-		0.0033	400	0.0049	450	0.0040	318	0.9968	1110	0.9807	1139	1.0000	747
590	interlinklabs-003	-		-		0.0029	314	0.0034	298	0.0046	380	0.0083	209	0.0074	295	0.0620	98
591	intozi-001	0.9982	1070	0.9998	1081	0.9998	1258	1.0000	1262	1.0000	1222	1.0000	1195	1.0000	1207	1.0000	1024
592	intsysmsu-000	0.0135	653	0.0204	644	0.0112	862	0.0161	837	0.0148	746	0.0244	493	0.0172	587	-	
593	intsysmsu-001	0.9543	1066	0.9888	1075	0.9923	1249	0.9948	1245	0.9977	1203	0.9955	1103	0.9892	1146	-	
594	intsysmsu-002	0.0130	645	0.0254	699	0.0137	916	0.0267	942	0.0160	765	0.0267	513	0.0145	538	-	
595	ionetworks-000	0.0060	412	0.0087	412	0.0044	535	0.0058	522	0.0080	560	0.0144	358	0.0112	449	0.1149	285
596	ionetworks-001	0.0254	785	0.0388	774	0.0435	1061	0.0662	1049	0.0426	962	0.8936	1017	0.7391	1069	0.9964	688
597	ionetworks-002	0.0045	304	0.0066	319	0.0033	394	0.0047	434	0.0544	990	0.9648	1054	0.8765	1098	0.9994	711
598	ionetworks-003	-		-		0.0034	417	0.0049	456	0.0043	350	0.0079	188	0.0056	191	0.0812	194
599	iqface-000	0.0091	537	0.0143	540	0.0075	730	0.0110	721	0.0171	791	0.2234	811	0.0359	750	-	
600	iqface-001	0.0088	524	0.0117	501	0.0177	960	0.0230	915	0.0165	775	0.5514	919	0.0286	715	-	
601	iqface-003	0.0058	393	0.0079	377	0.0051	597	0.0058	523	0.0104	651	0.0200	449	0.0193	624	-	
602	iqsec-001	-		-		0.7050	1216	0.8569	1217	0.7728	1151	0.9962	1109	0.9840	1140	1.0000	759
603	iqsec-002	-		-		0.7050	1215	0.8569	1216	0.7728	1152	0.9962	1108	0.9841	1141	1.0000	758
604	irex-000	0.0052	351	0.0099	449	0.0056	633	0.0083	650	0.0137	727	0.0163	398	0.0078	323	-	
605	isap-001	0.5092	1033	0.6588	1043	0.6899	1212	0.7978	1205	0.7200	1145	0.7253	959	0.5373	1029	-	
606	isap-002	0.0114	606	0.0186	622	0.0087	782	0.0151	819	0.0156	757	0.5134	907	0.0333	737	-	
607	isityou-000	0.5682	1041	0.7033	1050	1.0000	1327	0.9999	1256	1.0000	1318	1.0000	1239	1.0000	1338	-	
608	isystems-000	0.1267	935	0.1795	924	-		-		-		-		-		-	
609	isystems-001	0.0149	682	0.0245	692	0.0138	919	0.0210	898	0.0209	844	0.0332	564	0.0223	659	-	
610	isystems-002	0.0118	614	0.0182	615	0.0111	858	0.0162	843	0.0166	780	0.0284	526	0.0195	629	-	
611	itmo-001	-		0.4408	1001	-		-		-		-		-		-	
612	itmo-002	0.1607	950	0.2866	967	-		-		-		-		-		-	
613	itmo-003	0.0749	895	0.1398	906	-		-		-		-		-		-	
614	itmo-004	0.0255	786	0.0543	823	-		-		-		-		-		-	
615	itmo-005	0.0182	727	0.0345	755	0.0181	963	0.0348	973	0.0225	857	0.0378	603	0.0230	666	-	
616	itmo-006	0.0125	635	0.0220	664	0.0149	940	0.0266	938	0.0233	865	0.0383	604	0.0285	713	-	

Table 66: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)																	
	Algorithm	CONSTRAINED, COOPERATIVE																LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
617	itmo-007	0.0080	504	0.0125	513	0.0107	844	0.0185	872	0.0167	782	0.0222	474	0.0144	535	-	
618	itmo-008	0.0090	530	0.0150	556	0.0058	644	0.0059	530	0.0187	814	0.0355	583	0.0339	738	0.1758	377
619	ivacognitive-001	0.0189	734	0.0351	756	0.0123	891	0.0235	919	0.0198	834	0.0274	518	0.0155	555	-	
620	iws-000	0.4824	1027	0.5801	1032	0.6859	1211	0.8155	1210	0.8251	1165	0.7756	975	0.6400	1049	-	
621	jaakit-001	0.5830	1042	0.7146	1051	0.8173	1232	0.8893	1227	0.8950	1181	0.8387	1002	0.7091	1063	0.9733	644
622	jaakit-002	-		-		0.5729	1196	0.6951	1191	0.6495	1140	0.9894	1086	0.9721	1135	0.9999	732
623	kakao-001	0.4553	1022	0.5532	1027	0.6580	1206	0.8150	1209	0.4831	1127	1.0000	1361	1.0000	1298	-	
624	kakao-002	0.0625	879	0.1779	923	0.0791	1106	0.1381	1105	0.0636	1008	1.0000	1345	1.0000	1275	-	
625	kakao-003	0.0130	646	0.0185	620	0.0261	1014	0.0464	1012	0.0252	888	0.2380	823	0.0284	712	-	
626	kakao-004	0.0078	492	0.0103	467	0.0059	653	0.0102	703	0.0155	754	0.1182	750	0.0230	667	-	
627	kakao-005	0.0040	270	0.0059	287	0.0036	448	0.0057	511	0.0085	574	0.0239	489	0.0125	487	-	
628	kakao-007	0.0019	96	0.0028	87	0.0024	109	0.0026	132	0.0033	246	0.0061	124	0.0053	169	0.0580	77
629	kakao-008	0.0011	37	0.0018	39	0.0023	65	0.0023	66	0.0021	59	0.0041	41	0.0035	46	0.0475	30
630	kakao-009	0.0009	23	0.0013	17	0.0023	70	0.0023	67	0.0020	49	0.0039	33	0.0034	38	0.0468	27
631	kakaobank-000	0.0041	282	0.0058	279	0.0041	509	0.0058	525	0.0060	476	0.9988	1128	0.3243	981	1.0000	770
632	kakaobank-001	0.0030	192	0.0046	214	0.0032	385	0.0039	348	0.0049	402	0.9998	1157	0.9994	1176	1.0000	819
633	kakaobank-002	-		-		0.0026	217	0.0036	315	0.0038	300	0.3184	856	0.1174	886	0.6931	543
634	kakaobank-003	-		-		0.0023	88	0.0025	120	0.0029	189	0.0065	137	0.0052	164	0.0733	150
635	kakaopay-001	0.0152	686	0.0252	698	0.0145	930	0.0270	943	0.0232	863	0.0344	576	0.0194	625	0.2005	401
636	kasikornlabs-000	0.0112	602	0.0184	618	0.0086	778	0.0137	785	0.0130	709	0.0225	477	0.0148	544	0.1660	368
637	kasikornlabs-001	0.0138	660	0.0206	646	0.0087	781	0.0139	793	0.0142	733	0.0236	486	0.0171	583	0.1684	371
638	kasikornlabs-002	0.0069	453	0.0091	420	0.0048	570	0.0063	552	0.0076	537	0.0144	357	0.0110	445	0.1249	304
639	kasikornlabs-003	0.0057	379	0.0076	361	0.0042	524	0.0056	505	0.0059	466	0.0123	327	0.0098	401	0.1212	299
640	kasikornlabs-004	-		-		0.0041	515	0.0054	491	0.0057	451	0.0112	309	0.0095	394	0.1101	270
641	kasikornlabs-005	-		-		0.0037	450	0.0043	402	0.0054	431	0.0107	295	0.0093	384	0.1069	265
642	kbyai-000	-		-		0.0027	259	0.0032	254	0.0031	226	0.0079	190	0.0049	141	0.0655	124
643	kedacom-000	0.0055	370	0.0081	387	0.0111	861	0.0120	736	0.0415	958	0.0966	729	0.0686	832	-	
644	keyless-000	-		-		0.0025	179	0.0034	283	0.0031	225	0.1874	791	0.0568	817	0.5543	510
645	kiwitech-000	0.0076	485	0.0105	472	0.0081	757	0.0128	763	0.0096	621	0.0163	397	0.0101	412	-	
646	kloudspot-001	-		-		0.0140	920	0.0259	932	0.9999	1215	1.0000	1200	1.0000	1211	1.0000	782
647	kloudspot-002	-		-		0.0255	1009	0.0423	998	0.0192	824	0.8748	1009	0.7143	1065	0.9929	674
648	kneron-003	0.0542	865	0.0902	876	0.0346	1045	0.0562	1034	0.0919	1034	0.1251	756	0.0973	866	-	
649	kneron-005	0.0157	691	0.0259	703	0.0126	899	0.0212	899	0.0406	956	0.0693	697	0.0542	809	-	
650	knowutech-000	0.0039	267	0.0055	270	0.0028	300	0.0042	386	0.0042	337	0.0077	177	0.0059	213	0.0820	197
651	kogniza-001	-		-		0.0028	301	0.0031	244	0.0025	120	0.0048	71	0.0042	96	0.0557	64
652	kookmin-001	0.0462	855	0.0750	853	0.0489	1073	0.0842	1068	0.0659	1010	0.8380	1001	0.3212	980	-	
653	kookmin-002	0.0054	369	0.0077	368	0.0043	530	0.0065	564	0.0123	695	0.7591	969	0.0198	632	-	
654	koreaid-001	0.0031	198	0.0045	207	0.0026	218	0.0032	251	0.0043	349	0.0083	206	0.0068	263	0.0743	156
655	krungthai-002	0.0105	584	0.0161	578	0.0091	792	0.0141	799	0.7350	1147	0.9889	1084	0.9605	1128	0.9999	729
656	kuke3d-001	0.0058	386	0.0104	469	0.0083	766	0.0093	675	0.0270	895	0.9901	1087	0.8341	1087	1.0000	760
657	kuke3d-002	0.0077	489	0.0135	529	0.0069	701	0.0098	693	0.0111	671	1.0000	1199	1.0000	1206	1.0000	784
658	lebentech-000	0.5940	1043	0.7032	1049	0.8854	1237	0.9511	1233	0.9089	1185	0.9970	1111	0.9861	1144	0.9999	736
659	lebentech-001	0.0304	812	0.9032	1066	0.9998	1259	1.0000	1260	1.0000	1221	1.0000	1183	0.9999	1196	1.0000	814
660	lemalabs-001	0.0111	597	0.0175	603	0.0088	783	0.0142	800	0.0143	736	0.0228	481	0.0140	523	0.1646	365

Table 67: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
661	lightvision-000	-		-		0.0146	934	0.0232	917	0.0237	875	0.9638	1053	0.7768	1076	0.9986	700
662	lightvision-001	-		-		0.0068	696	0.0096	685	0.0084	572	0.9948	1100	0.9288	1113	1.0000	750
663	lineclova-000	0.0172	714	0.0236	683	0.0109	850	0.0194	884	0.0183	808	0.0291	531	0.0204	640	0.1936	392
664	lineclova-001	0.0025	148	0.0040	165	0.0026	241	0.0034	297	0.0045	376	0.4127	887	0.0080	331	0.9824	654
665	lineclova-002	0.0021	109	0.0035	125	0.0025	154	0.0027	151	0.0041	330	0.0086	224	0.0072	285	0.1595	357
666	lineclova-003	0.0018	92	0.0030	101	0.0028	297	0.0031	229	0.0041	331	0.0083	210	0.0075	309	0.1014	256
667	lookman-002	0.0297	809	0.0547	824	0.0339	1040	0.0562	1033	0.0614	1003	0.0960	728	0.0790	842	-	
668	lookman-004	0.0074	478	0.0099	452	0.0124	894	0.0149	815	0.0430	964	0.0866	717	0.0694	833	-	
669	luxand-000	0.2056	970	0.2814	965	0.4053	1176	0.5365	1174	0.3497	1111	0.3743	875	0.2605	960	-	
670	luxand-001	0.0116	608	0.0925	877	0.0144	928	0.0267	939	1.0000	1332	1.0000	1266	1.0000	1351	1.0000	877
671	luxand-003	-		-		0.9938	1251	0.9999	1253	0.2905	1103	0.2256	815	0.0849	853	0.4876	497
672	luxand-004	-		-		0.0031	363	0.0042	387	0.0110	668	0.9994	1137	0.9969	1162	1.0000	1074
673	mantra-000	0.0037	256	0.0052	257	0.0054	616	0.0056	507	0.0097	630	0.0181	422	0.0151	549	-	
674	matrixcomsec-000	-		-		0.1032	1119	0.0895	1074	1.0000	1239	1.0000	1335	1.0000	1260	1.0000	1219
675	matrixcomsec-001	-		-		0.0070	703	0.0136	779	0.8826	1179	1.0000	1244	1.0000	1340	1.0000	958
676	maverickresearch-000	-		-		0.0143	925	0.0192	880	0.0216	849	0.0362	592	0.0250	685	0.2293	412
677	maxvision-000	0.0078	494	0.0106	474	0.0110	854	0.0147	810	0.0368	944	1.0000	1284	0.1545	914	1.0000	1350
678	maxvision-001	0.0305	813	0.0528	819	0.1028	1117	0.1921	1125	0.0650	1009	0.3001	845	0.1553	916	0.6188	531
679	maxvision-002	0.0070	457	0.0107	475	0.0061	664	0.0093	674	0.0080	557	0.5726	923	0.2943	973	0.9160	617
680	maxvision-003	0.0056	374	0.0083	396	0.0038	482	0.0060	537	0.0061	479	0.2614	831	0.0650	827	0.5812	517
681	maxvision-004	0.0024	143	0.0038	155	0.0025	194	0.0029	196	0.0029	185	0.4732	900	0.1965	935	0.8141	577
682	maxvision-005	0.0014	55	0.0026	74	0.0024	117	0.0024	80	0.0025	110	0.1216	752	0.0332	735	0.3922	477
683	maxvision-006	0.0016	69	0.0026	72	0.0024	123	0.0024	84	0.0024	106	0.4012	885	0.1799	929	0.7634	557
684	mbbankvn-000	-		-		0.0030	322	0.0035	299	0.0026	135	0.3822	879	0.1130	880	0.7052	547
685	megvii-000	0.0159	696	0.0246	694	-		-		-		-		-		-	
686	megvii-001	0.0157	692	0.0244	689	0.0392	1054	0.0671	1050	0.0168	784	0.0455	628	0.0164	571	-	
687	megvii-002	0.0104	579	0.0145	545	0.0225	993	0.0345	971	0.0099	640	0.0286	527	0.0240	677	-	
688	megvii-003	0.0064	431	0.0094	432	0.0136	915	0.0260	934	0.0050	407	0.0080	195	0.0059	216	-	
689	megvii-004	0.0020	104	0.0033	118	0.0028	289	0.0035	311	0.0037	299	0.0074	168	0.0068	264	0.0736	154
690	megvii-005	0.0010	33	0.0015	23	0.0026	210	0.0031	234	0.0019	37	0.0500	645	0.0057	200	0.1991	399
691	megvii-006	0.0011	34	0.0016	27	0.0026	236	0.0033	271	0.0025	118	0.0050	85	0.0048	132	0.0588	86
692	megvii-007	0.0006	12	0.0016	26	0.0025	180	0.0028	169	0.0024	102	0.0048	76	0.0047	129	0.0586	80
693	megvii-008	0.0003	4	0.0008	8	0.0023	92	0.0021	38	0.0024	107	0.0049	79	0.0047	131	0.0541	58
694	megvii-009	0.0003	3	0.0008	7	0.0023	89	0.0021	37	0.0018	22	0.0149	368	0.0036	49	0.1096	269
695	meituan-000	0.0197	741	0.0424	785	0.0078	743	0.0074	605	0.0103	649	0.0193	442	0.0164	570	0.1133	282
696	meituan-001	0.0164	703	0.1886	930	0.0025	169	0.0026	127	0.0030	202	0.0074	166	0.0051	154	0.0791	184
697	meituan-002	0.0017	78	0.0025	65	0.0024	122	0.0023	64	0.0024	104	0.0067	151	0.0044	118	0.0773	176
698	meituan-003	0.0017	79	0.0021	51	0.0024	114	0.0023	75	0.0024	99	0.0084	214	0.0046	121	0.0883	213
699	meituan-004	0.0014	51	0.0021	46	0.0024	116	0.0024	93	0.0023	85	0.0070	157	0.0044	114	0.0813	196
700	meiya-001	0.0171	711	0.0275	715	0.0159	953	0.0261	937	0.0311	922	0.2250	814	0.0245	682	-	
701	mendaxiatech-000	0.0027	168	0.0036	137	0.0029	306	0.0036	327	0.0031	222	0.0057	104	0.0051	155	-	
702	metsakuurcompany-001	0.0068	452	0.0087	407	0.0068	699	0.0078	629	0.0095	617	0.8972	1021	0.5635	1033	0.9970	692
703	metsakuurcompany-002	0.0048	323	0.0071	338	0.0030	332	0.0043	404	0.0032	237	0.2059	803	0.0665	829	0.5374	506
704	metsakuurcompany-003	0.0034	227	0.0051	246	0.0026	215	0.0036	313	0.0028	172	0.2418	824	0.1001	868	0.5866	521

Table 68: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)																	
		CONSTRAINED, COOPERATIVE																LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER			
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06			
705	metsakuurcompany-004	-		-		0.0026	240	0.0032	246	0.0032	231	0.4488	897	0.2015	939	0.8129	576		
706	metsakuurcompany-005	-		-		0.0030	333	0.0041	376	0.0039	310	0.1725	784	0.0054	182	0.8274	579		
707	miaxis-001	0.0068	449	0.0099	450	0.0059	652	0.0097	690	0.0096	625	0.0231	484	0.0109	442	0.1592	354		
708	miaxis-002	0.0745	894	0.0774	860	0.3215	1166	0.4000	1158	0.1485	1059	0.2087	804	0.2058	940	0.3846	473		
709	miaxis-003	0.0045	302	0.0067	321	0.0037	466	0.0050	458	0.0061	481	0.0139	346	0.0088	364	0.1322	312		
710	miaxis-004	-		-		0.0037	449	0.0046	425	0.0057	455	0.0107	296	0.0084	356	0.1261	307		
711	microfocus-000	0.4656	1023	0.5624	1028	-		-		-		-		-		-			
712	microfocus-001	0.4482	1020	0.5524	1026	0.7256	1219	0.8416	1214	0.7301	1146	0.6926	951	0.5180	1026	-			
713	microfocus-002	0.3605	1001	0.5057	1016	0.5783	1197	0.7223	1193	0.5909	1134	0.5963	932	0.4160	1007	-			
714	microfocus-003	0.0416	842	0.0607	836	0.0652	1093	0.1025	1087	0.0793	1021	0.2248	813	0.0923	861	0.6153	529		
715	minivision-000	0.0033	214	0.0048	226	0.0038	478	0.0049	445	0.0055	438	0.0094	257	0.0079	328	-			
716	mitek-000	0.6882	1050	0.8192	1058	0.9568	1244	0.9788	1240	0.9545	1193	0.9437	1043	0.8494	1090	0.9931	676		
717	mitek-001	-		-		0.0050	588	0.0068	577	0.0053	427	0.0096	264	0.0077	319	0.1130	281		
718	mitek-002	-		-		0.0039	495	0.0054	487	0.0044	361	0.0085	221	0.0065	244	0.1112	277		
719	mobai-000	0.0360	834	0.0439	791	0.0372	1048	0.0700	1055	0.0367	943	0.0939	723	0.0795	844	-			
720	mobai-001	0.0199	745	0.0219	661	0.0047	561	0.0061	542	0.0093	613	0.0174	412	0.0138	520	-			
721	mobai-002	-		-		0.0048	571	0.0070	586	0.0088	592	0.5904	928	0.3167	979	0.8952	610		
722	mobbl-000	0.2938	989	0.3861	993	0.5391	1191	0.6888	1190	0.6545	1141	0.8027	984	0.6207	1043	-			
723	mobbl-001	0.3208	993	0.4375	1000	0.5680	1195	0.7193	1192	0.6282	1136	0.5783	924	0.3984	1002	0.8864	605		
724	mobbl-002	0.9914	1069	0.9970	1077	0.9355	1241	0.9923	1243	1.0000	1220	1.0000	1173	0.9999	1190	1.0000	791		
725	mobbl-003	0.0087	521	0.0134	528	0.0062	668	0.0087	663	0.0099	636	0.0197	445	0.0122	483	0.1618	364		
726	mobbl-004	-		-		0.0031	361	0.0043	401	0.0088	587	1.0000	1180	1.0000	1200	1.0000	794		
727	mobbl-005	-		-		0.0031	353	0.0044	415	0.0045	364	0.4420	895	0.1465	907	0.7973	573		
728	mobipintech-000	0.0090	531	0.0149	553	0.0039	498	0.0057	508	0.0115	680	0.0465	633	0.0182	604	0.6443	534		
729	momovn-001	0.1044	920	0.1694	920	0.3253	1168	0.5244	1171	0.3861	1117	0.9995	1139	0.9985	1167	1.0000	797		
730	momovn-002	-		-		0.0042	522	0.0060	539	0.0062	484	0.7672	971	0.5456	1031	0.9731	643		
731	momovn-003	-		-		0.0029	308	0.0033	264	0.0056	446	0.0093	248	0.0076	313	0.0612	95		
732	moredian-000	0.3874	1007	0.4912	1012	0.9988	1256	0.9999	1255	0.9990	1210	0.9999	1161	0.9998	1189	-			
733	morpho-000	0.1020	917	0.1343	903	-		-		-		-		-		-			
734	morpho-001	-		0.2772	962	-		-		-		-		-		-			
735	morpho-002	0.0377	836	0.0680	846	0.0368	1047	0.0716	1057	-		-		-		-			
736	mukh-001	0.0170	709	0.0285	717	0.0225	994	0.0405	992	0.0272	899	0.0950	725	0.0291	722	0.5846	520		
737	mukh-002	0.0269	795	0.0357	761	0.0435	1063	0.0799	1066	0.0143	737	0.0213	462	0.0122	482	0.1908	391		
738	mukh-003	0.0077	491	0.0113	494	0.0111	859	0.0224	908	0.0061	480	0.7813	978	0.4504	1012	0.9899	668		
739	mukh-004	0.0050	342	0.0069	335	0.0051	594	0.0099	699	0.0045	367	0.0083	208	0.0059	215	0.1030	259		
740	mukh-005	-		-		0.0023	63	0.0024	100	0.0056	445	0.0161	392	0.0067	254	0.1398	327		
741	multimodality-000	0.0034	229	0.0047	221	0.0036	444	0.0044	413	0.0077	543	0.9976	1116	0.4456	1011	1.0000	781		
742	multimodality-001	0.0029	182	0.0042	180	0.0031	345	0.0035	302	0.0038	301	0.0071	161	0.0059	212	0.0732	148		
743	mvision-001	0.0191	735	0.0233	677	0.0204	978	0.0356	975	0.0198	835	0.0337	571	0.0242	679	-			
744	nazhiai-000	0.0040	274	0.0059	291	0.0036	433	0.0048	442	0.0057	457	0.0125	332	0.0083	349	-			
745	ncsgroup-000	-		-		0.0126	898	0.0226	910	0.0179	799	0.1715	783	0.0287	717	0.6160	530		
746	ncssg-001	0.0207	751	0.1540	913	0.0045	543	0.0067	576	0.0056	450	0.1180	749	0.0301	725	0.3908	476		
747	ncssg-002	-		-		0.0032	381	0.0038	344	0.0033	242	0.3144	853	0.1061	873	0.7441	555		
748	ncssg-003	-		-		0.0033	397	0.0040	367	0.0033	254	0.2511	830	0.0959	865	0.6553	536		

Table 69: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
749	ncssg-004	-		-		0.0033	392	0.0041	385	0.0029	195	0.2454	826	0.0860	855	0.6010	523
750	neosystems-001	1.0000	1233	1.0000	1222	0.2987	1164	0.4382	1164	0.5173	1130	0.6570	944	0.4043	1005	-	
751	neosystems-002	0.2905	987	0.4077	996	0.2028	1150	0.3252	1151	0.4088	1122	0.5519	920	0.3331	985	0.9561	630
752	neosystems-003	0.2429	978	0.3349	981	0.1844	1146	0.2999	1148	0.5942	1135	0.3936	882	0.2292	949	0.8482	586
753	neosystems-004	0.0279	799	0.0495	809	0.0289	1025	0.0585	1040	0.0439	967	0.9621	1051	0.1296	893	0.9996	717
754	netbridgetech-001	0.4749	1025	0.6599	1044	0.4438	1182	0.5676	1177	0.4491	1125	1.0000	1166	0.9541	1123	-	
755	netbridgetech-002	0.0101	569	0.0166	586	0.0077	738	0.0127	758	0.0133	716	0.8215	993	0.0523	805	-	
756	neurotechnology-000	-		0.2371	949	-		-		-		-		-		-	
757	neurotechnology-001	0.1393	940	0.2218	946	-		-		-		-		-		-	
758	neurotechnology-002	0.1115	927	0.1663	919	-		-		-		-		-		-	
759	neurotechnology-003	0.0617	876	0.0880	872	-		-		-		-		-		-	
760	neurotechnology-004	0.0146	674	0.0297	725	0.0107	846	0.0164	847	-		-		-		-	
761	neurotechnology-005	0.0141	667	0.0300	728	0.0108	849	0.0163	846	0.0204	838	0.0875	718	0.0246	684	-	
762	neurotechnology-006	0.0098	558	0.0136	532	0.0105	841	0.0182	866	0.0164	773	0.0843	714	0.0214	650	-	
763	neurotechnology-008	0.0091	535	0.0184	617	0.0076	734	0.0116	730	0.0157	759	0.9973	1112	0.1803	931	-	
764	neurotechnology-009	0.0049	331	0.0087	408	0.0057	640	0.0094	677	0.0079	555	1.0000	1169	0.0101	411	-	
765	neurotechnology-010	0.0048	325	0.0085	402	0.0056	632	0.0090	669	0.0077	546	1.0000	1174	0.0113	452	-	
766	neurotechnology-011	0.0050	338	0.0087	405	0.0061	667	0.0097	689	0.0077	545	0.0404	613	0.0092	379	-	
767	neurotechnology-012	0.0051	347	0.0070	337	0.0038	470	0.0056	506	0.0066	498	0.0112	310	0.0075	306	0.1009	255
768	neurotechnology-013	0.0032	208	0.0045	206	0.0026	239	0.0036	314	0.0037	291	0.0068	152	0.0052	167	0.0747	161
769	neurotechnology-015	0.0022	123	0.0036	139	0.0024	108	0.0028	175	0.0030	199	0.0052	90	0.0041	95	0.0646	118
770	neurotechnology-016	0.0022	126	0.0032	115	0.0023	79	0.0027	152	0.0027	157	0.0049	80	0.0039	81	0.0613	96
771	neurotechnology-017	0.0017	81	0.0031	108	0.0023	61	0.0025	115	0.0025	126	0.0047	69	0.0038	67	0.0612	94
772	neurotechnology-018	0.0020	103	0.0029	95	0.0022	43	0.0024	88	0.0024	103	0.0046	60	0.0037	56	0.0586	81
773	neurotechnology-019	-		-		0.0022	41	0.0024	76	0.0022	64	0.0042	44	0.0034	35	0.0526	47
774	neurotechnology-020	-		-		0.0023	90	0.0028	190	0.0024	88	0.0043	51	0.0035	44	0.0562	68
775	nextmetalabs-001	-		-		0.1126	1125	0.1962	1127	0.1137	1045	1.0000	1179	0.9998	1186	1.0000	800
776	nextmetalabs-002	-		-		0.0066	690	0.0081	647	0.0097	628	0.9946	1099	0.9565	1125	1.0000	755
777	nextmetalabs-003	-		-		0.0023	98	0.0028	184	0.0028	168	0.9681	1058	0.8769	1099	0.9995	716
778	nhn-001	0.0066	442	0.0098	446	0.0053	610	0.0079	639	0.0093	609	0.0156	382	0.0109	440	-	
779	nhn-002	0.0068	451	0.0096	439	0.0057	642	0.0087	665	0.0136	726	0.0253	502	0.0186	614	0.1464	340
780	nhn-003	0.0033	215	0.0048	227	0.0027	258	0.0038	341	0.0036	283	0.0198	446	0.0071	281	0.1280	309
781	nhn-004	0.0030	187	0.0044	205	0.0025	182	0.0029	200	0.0030	214	0.0331	561	0.0113	455	0.1598	359
782	nhn-005	0.0028	172	0.0043	187	0.0023	83	0.0027	142	0.0025	111	0.0047	63	0.0038	66	0.0554	63
783	noblis-000	0.4424	1019	0.5415	1024	-		-		-		-		-		-	
784	nodeflux-000	1.0000	1225	1.0000	1214	1.0000	1294	-		0.9079	1184	-		-		-	
785	nodeflux-001	1.0000	1338	1.0000	1362	1.0000	1352	0.9998	1252	0.5169	1129	1.0000	1212	0.5654	1034	-	
786	nodeflux-002	0.0186	732	0.0340	748	0.0261	1013	0.0451	1005	0.0548	991	1.0000	1188	1.0000	1205	-	
787	nominder-000	0.0025	157	0.0036	142	0.0029	313	0.0033	269	0.0026	149	0.9919	1092	0.8877	1103	1.0000	764
788	nominder-001	0.0029	185	0.0042	185	0.0031	365	0.0038	343	0.0031	221	0.9975	1114	0.9180	1109	0.9999	738
789	nominder-002	0.0025	151	0.0037	145	0.0033	391	0.0037	332	0.0026	154	0.5785	925	0.1435	905	0.8381	582
790	nominder-003	-		-		0.0031	343	0.0034	287	0.0026	140	0.7010	955	0.2159	945	0.8909	608
791	nominder-004	-		-		0.0028	292	0.0033	265	0.0024	90	0.0316	547	0.0045	119	0.1348	318
792	nominder-005	-		-		0.0025	168	0.0029	195	0.0024	98	0.0046	61	0.0037	60	0.0537	57

Table 70: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)													
	Algorithm	CONSTRAINED, COOPERATIVE												LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
793	nominder-006	-		-		0.0027	260	0.0032	249	0.0030	211	0.0059	113	0.0052	161	0.0644	116
794	notiontag-000	0.6669	1048	0.7885	1056	0.3715	1173	0.4978	1170	0.8571	1170	0.8102	987	0.6460	1051	-	
795	notiontag-001	0.6846	1049	0.8006	1057	0.3955	1175	0.5247	1172	0.8669	1173	0.8313	999	0.6362	1048	-	
796	notiontag-002	0.0066	439	0.0089	415	0.0045	542	0.0061	543	0.0077	544	0.0137	345	0.0104	425	0.1106	274
797	nsensecorp-001	0.9909	1068	0.9994	1080	0.9987	1255	0.9999	1254	1.0000	1224	1.0000	1196	1.0000	1209	-	
798	nsensecorp-002	0.4277	1015	0.5375	1021	0.6734	1207	0.7924	1203	0.7194	1144	0.6937	953	0.5617	1032	0.9392	625
799	nsensecorp-003	0.0251	783	0.0295	724	0.0212	985	0.0305	958	0.0131	711	0.2139	807	0.0141	527	0.9968	691
800	nsensecorp-004	0.1370	939	0.1397	905	0.0066	689	0.0094	678	1.0000	1261	1.0000	1353	1.0000	1283	1.0000	1140
801	nsensecorp-005	0.0055	371	0.0080	382	0.0039	490	0.0058	524	0.2723	1100	0.9999	1160	0.9949	1154	1.0000	808
802	ntechlab-000	-		0.0862	870	-		-		-		-		-		-	
803	ntechlab-001	-		0.0825	866	-		-		-		-		-		-	
804	ntechlab-002	0.0558	871	0.0649	839	-		-		-		-		-		-	
805	ntechlab-003	0.0286	803	0.0390	775	-		-		-		-		-		-	
806	ntechlab-004	0.0090	529	0.0132	523	-		-		-		-		-		-	
807	ntechlab-005	0.0093	543	0.0145	546	0.0131	907	0.0275	945	-		-		-		-	
808	ntechlab-006	0.0078	496	0.0111	486	0.0112	865	0.0227	913	0.0108	660	0.0149	369	0.0098	403	-	
809	ntechlab-007	0.0056	375	0.0076	362	0.0073	724	0.0128	762	0.0079	554	0.0144	356	0.0102	413	-	
810	ntechlab-008	0.0041	284	0.0061	297	0.0056	629	0.0108	714	0.0042	343	0.0080	193	0.0063	235	-	
811	ntechlab-009	0.0039	268	0.0054	268	0.0042	526	0.0063	553	0.0275	902	0.0674	689	0.0532	806	-	
812	ntechlab-010	0.0013	50	0.0017	32	0.0024	141	0.0029	198	0.0031	223	0.0058	112	0.0050	147	0.0656	125
813	ntechlab-011	0.0012	45	0.0019	41	0.0024	133	0.0028	187	0.0029	191	0.0055	96	0.0047	126	0.0630	106
814	ntechlab-012	0.0011	39	0.0016	28	0.0023	96	0.0030	210	0.0026	143	0.0050	87	0.0043	103	0.0587	83
815	omface-000	0.2573	983	0.3835	992	0.3590	1171	0.4903	1168	0.3956	1119	0.5003	903	0.2595	959	0.9137	616
816	omface-001	0.0137	659	0.0212	653	0.0114	875	0.0187	876	0.0174	796	1.0000	1346	0.0214	652	1.0000	1180
817	omnigarde-000	0.0633	881	0.1002	885	0.1109	1123	0.2042	1131	0.1288	1049	0.5113	906	0.1227	891	0.9604	634
818	omnigarde-001	0.0168	707	0.0260	704	0.0203	977	0.0402	988	0.0243	880	0.0327	557	0.0177	596	0.2164	410
819	omnigarde-002	0.0033	226	0.0046	219	0.0027	271	0.0039	350	0.0041	333	0.0076	173	0.0059	218	0.0806	192
820	omnigarde-003	0.0024	140	0.0038	153	0.0024	147	0.0029	191	0.0032	239	0.0059	116	0.0049	143	0.0706	144
821	omnigarde-004	-		-		0.0022	38	0.0024	78	0.0023	76	0.0044	54	0.0038	68	0.0559	66
822	omnigarde-005	-		-		0.0022	48	0.0024	86	0.0024	95	0.0045	57	0.0039	79	0.0582	78
823	onfido-000	0.1472	944	0.2881	968	0.0335	1039	0.0731	1060	0.0515	985	0.9915	1090	0.9579	1126	1.0000	742
824	onfido-001	-		-		0.0146	933	0.0294	953	0.0190	819	0.0702	700	0.0352	745	0.3117	453
825	onfido-002	-		-		0.0067	691	0.0098	694	0.0062	486	0.0167	403	0.0091	377	0.1228	302
826	ooto-001	-		-		0.0193	970	0.0290	951	0.0529	989	0.0272	515	0.0255	688	0.1956	397
827	openedge-000	0.0045	305	0.0062	304	0.0049	576	0.0069	583	0.0049	401	0.9889	1085	0.7991	1083	0.9999	734
828	openface-001	0.1804	958	0.2921	970	0.2878	1161	0.3906	1157	0.2054	1081	0.2338	820	0.1549	915	0.6531	535
829	ovisionllc-001	-		-		0.0058	647	0.0081	641	0.8171	1162	1.0000	1197	1.0000	1201	1.0000	780
830	ovisionllc-002	-		-		0.1963	1147	0.2522	1137	1.0000	1225	1.0000	1203	1.0000	1212	1.0000	785
831	oz-001	0.0133	651	0.0215	659	0.0109	851	0.0160	836	0.0235	871	1.0000	1223	1.0000	1315	-	
832	oz-002	0.0071	467	0.0099	456	0.0099	826	0.0100	700	0.0139	729	0.0502	647	0.0202	637	-	
833	oz-003	0.0095	554	0.0143	541	0.0054	618	0.0077	622	0.0096	624	0.0175	416	0.0118	469	0.1404	329
834	oz-004	0.0033	220	0.0049	234	0.0038	485	0.0055	495	0.0081	563	0.0163	399	0.0142	530	-	
835	pa-002	0.1847	960	0.2859	966	-		-		-		-		-		-	
836	pa-003	0.0453	852	0.0679	845	-		-		-		-		-		-	

Table 71: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
837	palit-000	0.0062	416	0.0084	397	0.0039	488	0.0055	492	0.0055	440	0.4610	898	0.2468	951	0.8695	593
838	palit-001	0.0050	333	0.0068	328	0.0032	386	0.0047	435	0.0045	371	0.0110	302	0.0058	209	0.1446	337
839	pangiam-000	0.0031	201	0.0043	196	0.0026	200	0.0030	224	0.0038	302	0.0071	163	0.0061	225	0.0667	132
840	pangiam-001	0.0031	200	0.0044	198	0.0029	307	0.0040	370	0.0028	178	0.0362	591	0.0056	193	0.1711	373
841	pangiam-002	0.0030	191	0.0042	181	0.0026	232	0.0031	236	0.0030	208	0.1772	785	0.0385	758	0.6076	525
842	papago-001	0.0067	447	0.0096	442	0.0051	600	0.0077	620	0.0071	516	0.0126	333	0.0086	361	0.1033	261
843	papil11-000	0.0021	116	0.0030	104	0.0024	101	0.0024	96	0.0025	130	0.0047	66	0.0040	86	0.0536	54
844	papil11-001	-		-		0.0023	95	0.0024	94	0.0023	73	0.0185	429	0.0040	93	0.1449	338
845	papil11-002	-		-		0.0023	93	0.0024	89	0.0023	72	0.0130	339	0.0039	76	0.1112	278
846	papil11-003	-		-		0.0023	85	0.0024	90	0.0023	81	0.0042	46	0.0035	45	0.0529	49
847	papsav1923-001	0.0078	495	0.0130	522	0.0068	697	0.0105	708	0.0119	686	0.0221	472	0.0136	513	-	
848	papsav1923-002	0.0021	115	0.0034	121	0.0026	203	0.0030	222	0.0048	397	0.0093	247	0.0086	359	0.0630	105
849	papsav1923-003	0.0025	154	0.0035	126	0.0024	143	0.0025	105	0.0034	257	0.0066	143	0.0058	208	0.0603	89
850	paravision-004	0.0030	193	0.0046	215	0.0030	326	0.0036	318	0.0091	603	0.0188	433	0.0173	589	-	
851	paravision-006	0.0016	70	0.0025	67	0.0026	211	0.0026	139	0.0075	535	0.9933	1096	0.0142	528	-	
852	paravision-008	0.0018	85	0.0025	66	0.0024	121	0.0025	113	0.0036	282	0.0070	159	0.0063	234	0.0747	162
853	paravision-010	0.0012	46	0.0021	47	0.0022	37	0.0021	31	0.0027	164	0.0055	97	0.0050	149	0.0534	53
854	paravision-011	0.0008	14	0.0020	45	0.0021	25	0.0020	15	0.0026	144	0.0053	91	0.0049	142	0.0498	38
855	paravision-013	0.0010	32	0.0018	38	0.0021	17	0.0019	3	0.0019	43	0.0041	42	0.0036	51	0.0442	20
856	paravision-015	-		-		0.0021	23	0.0021	36	0.0021	51	0.0043	48	0.0039	72	0.0528	48
857	paravision-017	-		-		0.0021	14	0.0021	21	0.0019	33	0.0038	30	0.0035	41	0.0458	24
858	paravision-018	-		-		0.0020	5	0.0020	13	0.0016	11	0.0034	17	0.0029	16	0.0414	8
859	paravision-020	-		-		0.0020	1	0.0020	10	0.0015	7	0.0033	12	0.0028	10	0.0410	7
860	pensees-001	0.0087	523	0.0133	526	0.0071	708	0.0122	746	0.0145	741	0.0252	501	0.0195	630	-	
861	pentacomp-000	-		-		0.0041	516	0.0061	541	0.0047	388	0.3501	865	0.1211	889	0.7162	550
862	pixelall-002	0.0193	738	0.0340	750	0.0127	901	0.0209	896	0.0234	870	0.9182	1025	0.2728	965	-	
863	pixelall-003	0.0074	479	0.0118	502	0.0057	637	0.0079	634	0.0121	690	0.0390	609	0.0170	581	-	
864	pixelall-004	0.0040	276	0.0061	296	0.0055	624	0.0069	581	0.0100	642	0.5663	922	0.0371	755	-	
865	pixelall-005	0.0038	260	0.0052	254	0.0043	531	0.0051	467	0.0077	542	0.0839	713	0.0136	515	-	
866	pixelall-006	0.0032	207	0.0042	179	0.0032	375	0.0039	352	0.0063	488	0.9960	1106	0.0723	837	1.0000	767
867	pixelall-007	0.0036	252	0.0049	236	0.0039	486	0.0044	406	0.0068	503	0.9873	1079	0.0217	654	1.0000	749
868	pixelall-008	0.0015	57	0.0023	61	0.0034	418	0.0049	444	0.0031	220	0.0057	103	0.0052	159	0.0682	136
869	pixelall-009	0.0018	86	0.0025	68	0.0024	137	0.0026	133	0.0031	228	0.3475	864	0.0053	172	0.9006	613
870	pixelall-010	0.0020	101	0.0030	103	0.0025	174	0.0028	189	0.0031	224	0.3512	866	0.0054	176	0.8813	601
871	pnpsecure-000	-		-		0.0190	967	0.0274	944	0.9980	1205	0.9997	1148	0.9996	1181	0.9997	720
872	privid-001	0.3350	997	0.5013	1014	0.4327	1180	0.5880	1178	0.9790	1197	1.0000	1181	0.9998	1187	1.0000	815
873	privid-002	0.0460	854	0.0652	841	0.0524	1080	0.0882	1073	0.0671	1011	0.9769	1064	0.8960	1104	0.9999	728
874	privid-003	-		-		0.0030	329	0.0039	349	0.0045	373	0.9996	1144	0.9985	1168	1.0000	776
875	privid-004	-		-		0.0026	234	0.0028	173	0.0034	258	0.9939	1098	0.9657	1132	1.0000	756
876	psl-000	0.0216	755	0.0333	745	-		-		-		-		-		-	
877	psl-001	0.0549	868	0.0927	878	0.0096	812	0.0149	816	-		-		-		-	
878	psl-002	0.0107	589	0.0180	612	0.0089	786	0.0120	739	0.0790	1020	0.0270	514	0.0192	621	-	
879	psl-003	0.0065	438	0.0099	454	0.0055	621	0.0075	612	1.0000	1223	0.0188	434	0.0129	498	-	
880	psl-004	0.0064	432	0.0094	436	0.0035	423	0.0050	462	0.0084	570	0.0145	361	0.0106	433	-	

Table 72: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
881	psl-005	0.0060	407	0.0094	430	0.0034	419	0.0048	440	0.0081	562	0.0140	349	0.0103	422	-	
882	psl-006	0.0025	156	0.0039	162	0.0028	288	0.0030	217	0.0160	763	0.0482	640	0.0310	727	-	
883	psl-007	0.0026	160	0.0040	168	0.0027	250	0.0030	214	0.0054	430	0.0101	280	0.0081	338	-	
884	psl-008	0.0026	159	0.0040	167	0.0024	131	0.0028	183	0.0041	334	0.0077	176	0.0055	183	0.0719	146
885	psl-009	0.0161	700	0.0294	723	0.0023	75	0.0025	107	0.0036	285	0.0065	141	0.0048	137	0.0659	127
886	psl-010	0.0017	84	0.0035	130	0.0023	68	0.0025	101	0.0035	273	0.0104	285	0.0052	166	0.0994	251
887	psl-011	0.0013	48	0.0026	78	0.0021	7	0.0021	27	0.0024	93	0.0047	65	0.0035	47	0.0565	71
888	psl-012	0.0017	73	0.0027	81	0.0021	27	0.0023	58	0.0021	52	0.0039	32	0.0032	29	0.0494	36
889	psl-013	-		-		0.0022	32	0.0023	61	0.0021	58	0.0039	35	0.0033	31	0.0499	40
890	psl-014	-		-		0.0021	28	0.0023	59	0.0021	56	0.0039	34	0.0033	30	0.0498	39
891	ptakuratsatu-000	0.0060	409	0.0089	418	0.0070	705	0.0104	707	0.0096	627	0.0152	376	0.0100	408	-	
892	pxl-001	0.0488	858	0.0752	854	0.0586	1087	0.1087	1089	0.0946	1035	0.1065	737	0.0625	825	-	
893	pyramid-000	0.0136	656	0.0233	679	0.0117	880	0.0192	881	0.0185	811	0.0322	554	0.0206	643	-	
894	pyramid-001	-		-		0.0025	156	0.0030	219	0.0025	119	0.0099	271	0.0044	109	0.1031	260
895	qazbs-000	0.0058	387	0.0083	394	0.0046	556	0.0072	595	0.0130	708	0.0244	494	0.0196	631	0.7784	564
896	qazsmartvisionai-000	0.0008	16	0.0011	11	0.0021	8	0.0022	40	0.0018	29	0.0035	23	0.0030	19	0.0441	19
897	qazsmartvisionai-001	0.0003	2	0.0008	6	0.0020	6	0.0020	19	0.0015	6	0.0031	6	0.0027	6	0.0394	5
898	qazsmartvisionai-002	-		-		0.0020	2	0.0020	8	0.0014	2	0.0028	2	0.0025	2	0.0380	2
899	qazsmartvisionai-003	-		-		0.0020	3	0.0020	9	0.0015	3	0.0029	3	0.0025	3	0.0381	3
900	qazsmartvisionai-004	-		-		0.0020	4	0.0020	12	0.0014	1	0.0028	1	0.0025	1	0.0377	1
901	qluevision-001	0.0223	761	0.0419	781	0.0205	980	0.0343	970	0.0327	929	0.8762	1010	0.7413	1070	0.9908	670
902	qnap-000	0.0149	681	0.0228	673	0.0155	946	0.0267	940	0.0238	878	0.8329	1000	0.0396	763	0.9992	706
903	qnap-001	0.0148	677	0.0215	657	0.0103	834	0.0162	842	0.0183	810	0.0301	534	0.0186	613	0.1995	400
904	qnap-002	0.0122	624	0.0191	628	0.0075	733	0.0095	682	0.0146	742	0.0281	525	0.0184	606	0.1829	383
905	qnap-003	0.0637	882	0.0657	844	0.0058	645	0.0078	628	0.0082	565	0.9985	1124	0.9658	1133	1.0000	783
906	qnap-004	0.0046	316	0.0061	295	0.0038	473	0.0059	531	0.0042	341	0.9960	1105	0.9442	1118	1.0000	753
907	qnap-005	0.0033	222	0.0047	224	0.0068	695	0.0071	591	0.0096	623	0.0184	428	0.0163	568	0.0948	246
908	qnap-006	-		-		0.0030	335	0.0041	381	0.0044	360	0.0088	234	0.0065	246	0.0799	188
909	quantasoft-003	0.0081	507	0.0113	492	0.0056	631	0.0076	615	0.0091	602	0.0161	394	0.0107	437	0.1193	292
910	rankone-000	-		0.2760	960	-		-		-		-		-		-	
911	rankone-001	-		0.4198	998	-		-		-		-		-		-	
912	rankone-002	0.1547	948	0.2170	943	-		-		-		-		-		-	
913	rankone-003	0.1175	930	0.1838	929	-		-		-		-		-		-	
914	rankone-004	0.0548	867	0.1015	886	-		-		-		-		-		-	
915	rankone-005	0.0405	841	0.0757	856	0.0170	958	0.0299	955	-		-		-		-	
916	rankone-006	0.0242	770	0.0460	797	0.0119	884	0.0188	878	0.0315	925	0.0539	656	0.0385	760	-	
917	rankone-007	0.0197	742	0.0366	766	0.0113	868	0.0177	861	0.0286	909	0.0454	627	0.0333	736	-	
918	rankone-008	0.0124	631	0.0232	676	0.0082	760	0.0107	710	0.0188	816	0.0320	553	0.0244	681	-	
919	rankone-009	0.0087	522	0.0119	503	0.0065	684	0.0086	661	0.0088	588	0.0161	391	0.0121	480	-	
920	rankone-010	0.0079	497	0.0112	490	0.0061	662	0.0081	645	0.0088	585	0.0149	366	0.0117	467	-	
921	rankone-011	0.0049	327	0.0075	358	0.0038	469	0.0048	441	0.0060	474	0.0143	355	0.0080	334	0.1839	384
922	rankone-012	0.0043	295	0.0058	281	0.0031	369	0.0038	340	0.0047	387	0.0081	199	0.0065	242	0.0842	204
923	rankone-013	0.0028	174	0.0041	175	0.0026	204	0.0033	267	0.0028	182	0.0055	99	0.0040	85	0.0725	147
924	rankone-014	0.0016	72	0.0021	50	0.0024	105	0.0027	150	0.0022	69	0.0047	67	0.0035	43	0.0666	131

Table 73: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
925	rankone-015	0.0009	20	0.0014	20	0.0024	112	0.0026	129	0.0024	105	0.0044	56	0.0037	53	0.0635	111
926	realnetworks-000	0.0325	822	0.0463	798	-		-		-		-		-		-	
927	realnetworks-001	0.0315	820	0.0455	795	0.0920	1113	0.1938	1126	-		-		-		-	
928	realnetworks-002	0.0248	776	0.0358	762	0.0513	1078	0.1127	1095	0.0371	945	0.0614	676	0.0316	730	-	
929	realnetworks-003	0.0259	789	0.0372	769	0.0541	1084	0.1208	1099	0.0378	948	0.0578	665	0.0306	726	-	
930	realnetworks-004	0.0075	484	0.0101	459	0.0066	687	0.0097	691	0.0108	666	0.0187	431	0.0131	500	0.1430	334
931	realnetworks-005	0.0070	454	0.0093	428	0.0063	673	0.0089	668	0.0092	606	0.0161	395	0.0104	426	0.1249	305
932	realnetworks-006	0.0040	272	0.0056	273	0.8657	1236	0.9705	1235	0.0059	467	0.0112	307	0.0085	357	0.0911	232
933	realnetworks-007	0.0031	202	0.0051	249	0.0028	285	0.0035	306	0.0048	398	0.0091	239	0.0074	298	0.0945	245
934	realnetworks-008	0.0022	125	0.0039	158	0.0038	471	0.0045	416	0.0055	435	0.0100	278	0.0080	337	0.0889	215
935	realsense-001	-		-		0.0023	67	0.0025	117	0.0023	86	0.0046	62	0.0039	71	0.0537	55
936	rebs-000	0.0030	189	0.0043	194	0.0024	119	0.0032	248	0.0024	91	0.3069	847	0.1170	883	0.7667	559
937	rebs-001	0.0037	254	0.0049	235	0.0024	144	0.0033	263	0.0025	112	0.0257	507	0.0096	398	0.1487	344
938	recognito-000	0.0004	5	0.0006	2	0.0021	24	0.0022	51	0.0016	13	0.0555	658	0.0207	645	0.1943	394
939	recognito-001	0.0003	1	0.0007	4	0.0021	15	0.0022	44	0.0016	8	0.0663	686	0.0257	689	0.1825	382
940	regula-000	0.0184	729	0.0376	770	0.0103	835	0.0185	871	0.0120	688	0.9983	1121	0.0231	668	1.0000	788
941	regula-001	0.0072	470	0.0107	478	0.0102	832	0.0179	863	0.0123	696	0.0333	566	0.0174	591	0.3711	469
942	regula-002	-		-		0.0053	606	0.0058	521	0.0044	363	0.9999	1159	0.9995	1177	1.0000	787
943	remarkai-000	0.0147	676	0.0257	702	0.0102	829	0.0158	831	0.0163	772	0.0577	663	0.0185	608	-	
944	remarkai-001	0.0144	671	0.0256	700	0.0102	830	0.0159	834	0.0162	770	0.0582	668	0.0185	610	-	
945	remarkai-002	0.0151	685	0.0197	640	0.0075	731	0.0108	716	0.0119	687	0.0187	432	0.0127	490	-	
946	remarkai-003	0.0047	321	0.0063	309	0.0033	402	0.0049	448	0.0054	432	0.0100	277	0.0072	287	0.0908	229
947	rendip-000	0.0055	373	0.0077	366	0.0048	573	0.0060	538	0.0080	558	0.0142	354	0.0110	446	0.1027	258
948	revealmedia-005	0.0050	339	0.0074	354	0.0050	586	0.0068	580	0.0075	536	0.0124	329	0.0104	429	0.0895	220
949	revealmedia-006	0.0040	278	0.0067	322	0.0041	513	0.0056	501	0.0056	443	0.0085	223	0.0068	258	0.0872	210
950	roc-016	0.0009	22	0.0014	22	0.0023	71	0.0024	82	0.0024	96	0.0042	47	0.0035	42	0.0558	65
951	roc-017	-		-		0.0023	64	0.0025	119	0.0021	57	0.0039	31	0.0032	26	0.0542	59
952	roc-018	0.0007	13	0.0012	13	0.0022	39	0.0022	46	0.0018	30	0.0034	20	0.0029	13	0.0493	35
953	roc-019	-		-		0.0021	30	0.0021	26	0.0016	14	0.0032	8	0.0027	7	0.0439	17
954	rokid-000	0.0093	545	0.0145	544	0.0073	722	0.0102	705	0.0164	774	0.0280	521	0.0214	651	-	
955	rokid-001	0.0105	582	0.0162	579	0.0094	806	0.0163	844	0.0181	803	0.0276	520	0.0165	575	-	
956	s1-001	0.0314	819	0.0651	840	0.0252	1008	0.0357	976	0.0444	968	0.0653	683	0.0429	776	-	
957	s1-002	0.0095	552	0.0144	543	0.0112	864	0.0196	886	0.0234	868	0.0371	598	0.0282	711	-	
958	s1-003	0.0051	346	0.0073	350	0.0044	536	0.0063	555	0.0052	423	0.0096	263	0.0070	273	0.0870	209
959	s1-004	0.0053	359	0.0080	383	0.0038	472	0.0059	529	0.0057	453	0.0103	282	0.0073	293	0.0899	224
960	s1-005	0.0024	145	0.0036	140	0.0025	188	0.0029	199	0.0026	152	0.0048	77	0.0038	64	0.0638	113
961	s1-006	0.0029	184	0.0044	202	0.0028	276	0.0033	261	0.0035	271	0.0073	164	0.0044	117	0.7160	549
962	s1-007	0.0023	136	0.0056	275	0.0024	106	0.0028	164	0.0025	124	0.0048	73	0.0039	73	0.0608	91
963	s1-008	-		-		0.0093	800	0.0137	782	0.0179	801	0.9118	1023	0.0286	716	0.9999	731
964	s1-009	-		-		0.0023	97	0.0023	71	0.0022	63	0.0043	49	0.0037	54	0.0504	43
965	saffe-001	0.4339	1016	0.5261	1019	0.7539	1226	0.8736	1224	0.7977	1157	0.9810	1068	0.7435	1071	-	
966	saffe-002	0.0119	618	0.0206	645	0.0107	848	0.0177	859	0.0244	881	0.9998	1149	0.2785	967	-	
967	samsungsds-000	0.0046	314	0.0069	333	0.0132	909	0.0081	642	0.0099	637	0.0179	420	0.0162	567	0.1101	271
968	samsungsds-001	0.0015	61	0.0026	73	0.0023	76	0.0023	70	0.0024	97	0.1660	781	0.0536	807	0.4995	502

Table 74: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
969	samsungsds-002	0.0017	80	0.0027	79	0.0023	69	0.0022	41	0.0021	55	0.0043	50	0.0036	52	0.0586	82
970	samtech-000	0.3418	999	0.4425	1002	-		-		-		-		-		-	
971	samtech-001	0.0197	743	0.0365	764	0.0146	936	0.0241	922	0.0238	877	0.0394	610	0.0251	686	-	
972	samtech-002	0.0084	514	0.0127	519	0.0093	797	0.0158	829	0.0113	677	0.0442	621	0.0132	501	0.4110	482
973	scanovate-001	0.0175	716	0.0331	744	0.0163	956	0.0248	924	0.2476	1095	0.3801	877	0.3740	994	-	
974	scanovate-002	0.0175	717	0.0355	759	0.0146	932	0.0286	949	0.0269	893	0.0301	533	0.0178	599	-	
975	scanovate-003	0.0054	365	0.0080	384	0.0054	612	0.0072	600	0.0312	923	0.0599	672	0.0568	818	-	
976	sdc-000	0.0303	811	0.0526	817	0.0572	1086	0.1094	1091	0.0867	1030	0.6230	936	0.3682	993	0.8797	599
977	seamfix-001	-		-		0.1973	1148	0.2878	1144	0.2613	1098	0.3156	854	0.1976	937	0.8176	578
978	securifai-001	0.4538	1021	0.6142	1036	0.5844	1199	0.7428	1195	0.7051	1143	0.9961	1107	0.9558	1124	-	
979	securifai-002	0.7557	1054	0.8574	1059	0.4550	1184	0.5953	1179	0.9860	1199	0.9796	1067	0.9158	1108	-	
980	securifai-003	0.4086	1010	0.7577	1054	0.7233	1217	0.8070	1206	0.7787	1154	1.0000	1193	0.9988	1171	1.0000	799
981	securifai-004	0.0136	655	0.0192	629	0.0064	677	0.0099	698	0.0115	679	0.0272	516	0.0127	492	0.4881	498
982	securifai-005	0.0125	633	0.0190	626	0.0080	753	0.0126	752	0.0134	719	0.9861	1074	0.9205	1110	1.0000	748
983	securifai-006	0.0140	665	0.0196	636	0.0067	693	0.0102	702	0.0113	675	0.9888	1083	0.9239	1112	1.0000	751
984	securifai-007	0.0124	629	0.0175	604	0.0064	679	0.0105	709	0.0108	659	0.9999	1158	0.9966	1161	1.0000	804
985	securifai-008	-		-		0.0060	660	0.0102	704	0.2096	1085	0.9649	1055	0.8757	1097	0.9990	704
986	sensetime-001	0.0063	425	0.0092	426	0.0130	905	-		0.0252	887	0.0886	719	0.0886	859	-	
987	sensetime-002	0.0068	450	0.0098	447	0.0143	927	1.0000	1264	0.0278	906	0.0502	646	0.0502	799	-	
988	sensetime-003	0.0021	117	0.0027	86	0.0027	243	0.0027	158	0.0051	418	0.0100	276	0.0089	368	-	
989	sensetime-004	0.0026	161	0.0038	152	0.0022	45	0.0023	65	0.0042	338	0.0082	203	0.0078	322	-	
990	sensetime-005	0.0019	94	0.0029	94	0.0022	36	0.0021	28	0.0023	79	0.0044	52	0.0039	69	0.0564	69
991	sensetime-006	0.0014	53	0.0024	63	0.0021	26	0.0020	11	0.0021	50	0.0040	39	0.0036	50	0.0525	46
992	sensetime-007	0.0012	42	0.0022	52	0.0021	29	0.0020	14	0.0018	26	0.0034	15	0.0029	18	0.0479	33
993	sensetime-008	0.0008	15	0.0014	18	0.0021	11	0.0020	6	0.0018	32	0.0036	24	0.0033	32	0.0504	42
994	sensetime-010	-		-		0.0022	31	0.0021	25	0.0018	23	0.0034	18	0.0029	17	0.0437	16
995	serendipity-000	0.0046	310	0.0069	334	0.0042	527	0.0056	500	0.0073	526	0.9129	1024	0.7189	1067	0.9952	683
996	sertis-000	0.0118	617	0.0208	649	0.0080	749	0.0127	755	0.0110	670	0.0176	418	0.0114	456	-	
997	sertis-001	0.0113	603	0.0182	614	0.0204	979	0.0403	991	0.0216	850	0.0763	707	0.0282	710	-	
998	sertis-002	0.0049	328	0.0061	292	0.0039	496	0.0061	548	0.0055	437	0.0099	274	0.0070	275	0.0921	236
999	sertis-003	0.0049	330	0.0059	289	0.0037	460	0.0058	520	0.0055	442	0.0100	275	0.0072	288	0.0881	212
1000	seventhsense-000	0.0067	448	0.0099	457	0.0045	540	0.0065	566	0.0093	610	0.0169	408	0.0124	486	0.1325	314
1001	seventhsense-001	0.0034	230	0.0047	222	0.0025	187	0.0031	232	0.0029	190	0.0338	572	0.0109	441	0.2135	408
1002	seventhsense-002	0.0036	248	0.0050	243	0.0028	284	0.0036	316	0.0035	270	0.0811	710	0.0183	605	0.5444	508
1003	seventhsense-003	0.0035	239	0.0046	213	0.0026	226	0.0033	262	0.0062	482	0.0448	625	0.0175	593	0.2594	432
1004	seventhsense-005	0.0031	199	0.0045	208	0.0028	278	0.0030	204	0.0028	176	0.0466	634	0.0165	576	0.1949	395
1005	seventhsense-006	-		-		0.0029	309	0.0034	292	0.0035	279	0.2052	802	0.0802	846	0.4742	494
1006	shaman-000	0.9297	1065	0.9774	1073	0.9990	1257	0.9997	1251	0.9999	1214	1.0000	1176	0.9999	1194	-	
1007	shaman-001	0.3346	996	0.4616	1004	0.2368	1156	0.3723	1156	0.3574	1113	0.3527	867	0.2304	950	-	
1008	shu-001	0.0103	575	0.0140	538	0.0293	1030	0.0688	1053	0.0172	792	0.0182	424	0.0120	476	-	
1009	shu-002	-		0.0079	379	0.0146	935	0.0308	959	1.0000	1219	0.0183	425	0.0115	459	-	
1010	shu-003	0.0028	171	0.0041	176	0.0050	583	0.0088	666	0.0081	564	0.0133	340	0.0094	389	-	
1011	siat-002	0.0091	536	0.0126	518	0.0109	852	0.0190	879	0.0276	905	0.0516	650	0.0464	791	-	
1012	siat-004	0.0067	446	0.0099	453	0.0152	944	1.0000	1263	0.0275	900	0.4823	901	0.4823	1016	-	

Table 75: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1013	siat-005	0.0021	110	0.0038	148	0.0059	650	0.0049	451	0.0742	1016	0.9623	1052	0.6801	1053	0.9833	655
1014	sightropic-000	-		-		0.0028	299	0.0038	346	0.0029	186	0.2207	809	0.0810	848	0.5137	504
1015	sightropic-001	-		-		0.0052	605	0.0049	452	0.0050	410	0.0094	254	0.0081	341	0.0672	133
1016	sjtu-001	0.0051	345	0.0080	381	0.0211	983	0.0446	1004	0.0131	710	0.0175	414	0.0110	444	-	
1017	sjtu-002	0.0053	363	0.0078	372	0.0138	917	0.0296	954	0.0084	571	0.0136	343	0.0095	395	-	
1018	sjtu-003	0.0017	75	0.0033	117	0.0030	330	0.0037	330	0.0058	459	0.0104	286	0.0081	339	-	
1019	sjtu-004	0.0014	52	0.0025	64	0.0027	249	0.0028	188	0.0046	378	0.0086	227	0.0073	292	0.0906	227
1020	sjtu-005	0.0029	180	0.0036	141	0.0025	192	0.0027	153	0.0044	356	0.0120	326	0.0072	283	0.1325	313
1021	sjtu-006	-		-		0.0027	256	0.0028	170	0.0044	362	0.0081	202	0.0071	282	0.0715	145
1022	sjtu-007	-		-		0.0023	94	0.0023	56	0.0040	320	0.0251	499	0.0126	489	0.1694	372
1023	sjtu-008	-		-		0.0022	35	0.0023	60	0.0029	183	0.0078	187	0.0055	188	0.0748	163
1024	sktelecom-000	0.0038	263	0.0054	267	0.0031	341	0.0051	469	0.0042	336	0.3418	861	0.0061	224	0.9499	628
1025	smartbiometrik-001	0.5485	1037	0.6442	1039	0.7550	1227	0.8611	1220	0.8677	1174	0.8270	997	0.7030	1058	0.9752	646
1026	smartengines-000	0.6240	1044	0.7562	1053	0.9552	1243	0.9784	1239	0.9515	1192	0.9288	1036	0.8200	1085	0.9930	675
1027	smartengines-001	0.6434	1046	0.7666	1055	0.9446	1242	0.9750	1238	0.9387	1190	0.9556	1047	0.8647	1092	0.9972	694
1028	smartvist-000	0.0912	911	0.1587	915	0.1163	1128	0.1841	1122	0.1397	1054	0.9372	1041	0.7107	1064	0.9990	705
1029	smartvist-001	0.0137	658	0.0244	688	0.0099	824	0.0158	830	0.0151	749	0.1349	763	0.0419	772	0.5589	513
1030	smilart-001	0.6476	1047	0.8779	1061	-		-		-		-		-		-	
1031	smilart-002	0.2440	979	0.3532	986	-		-		0.3785	1114	0.4145	889	0.2611	961	-	
1032	smilart-003	0.6944	1051	0.8836	1062	0.0695	1098	0.1193	1097	0.0894	1032	0.1221	753	0.0737	838	-	
1033	sodec-000	0.0033	221	0.0044	204	0.0040	502	0.0053	483	0.0054	433	0.0096	261	0.0080	330	0.0915	233
1034	sparktek-000	-		-		0.0025	152	0.0025	111	0.0031	227	0.0058	109	0.0053	170	0.0643	115
1035	sparsh-001	0.0018	93	0.0029	99	0.0026	213	0.0028	180	0.0027	159	0.8806	1012	0.6313	1045	0.9963	686
1036	sqisoft-001	0.1220	933	0.2088	939	0.1978	1149	0.3386	1152	0.2111	1086	0.2798	840	0.1474	909	0.7820	566
1037	sqisoft-002	0.0082	509	0.0124	509	0.0051	593	0.0086	660	0.0102	646	0.0183	426	0.0122	481	0.1498	346
1038	sqisoft-003	0.0041	287	0.0055	272	0.0026	199	0.0032	258	0.0039	315	1.0000	1219	1.0000	1318	1.0000	1045
1039	staqu-000	0.0139	663	0.0208	648	0.0104	836	0.0145	809	0.0156	755	0.8063	985	0.1408	904	-	
1040	starhybrid-001	0.0108	590	0.0138	534	0.0081	755	0.0113	726	0.0152	750	0.0265	512	0.0189	618	-	
1041	stcon-000	0.0040	273	0.0056	274	0.0031	356	0.0047	430	0.0048	399	0.9863	1075	0.3562	991	0.9999	733
1042	stcon-001	0.0040	269	0.0053	263	0.0030	336	0.0045	417	0.0047	386	0.8632	1008	0.1788	928	0.9892	666
1043	stcon-002	0.0031	197	0.0043	193	0.0025	159	0.0034	286	0.0030	207	0.9988	1127	0.9855	1143	1.0000	762
1044	stcon-003	0.0038	261	0.0050	242	0.0024	107	0.0032	255	0.0023	78	0.1082	741	0.0350	744	0.3982	479
1045	stcon-004	-		-		0.0022	47	0.0025	118	0.0020	46	0.0519	651	0.0145	536	0.2564	430
1046	stcon-005	-		-		0.0021	20	0.0021	22	0.0017	17	0.0336	569	0.0115	461	0.1725	374
1047	stcon-006	-		-		0.0021	21	0.0021	23	0.0017	16	0.0034	16	0.0028	9	0.0425	12
1048	stcon-007	-		-		0.0021	19	0.0021	20	0.0017	15	0.0033	13	0.0028	8	0.0424	11
1049	stcon-008	-		-		0.0021	13	0.0020	4	0.0015	4	0.0029	5	0.0026	4	0.0390	4
1050	stengg-000	0.0059	403	0.0082	391	0.0037	463	0.0060	536	0.0050	408	0.5065	905	0.0792	843	0.9348	624
1051	sukshi-000	0.5409	1035	0.6612	1045	0.4556	1185	0.6567	1186	0.9296	1189	0.8898	1016	0.7384	1068	0.9899	667
1052	sumsub-000	-		-		0.0041	512	0.0043	403	0.0038	304	0.5301	915	0.2536	955	0.9068	614
1053	suprema-000	0.0064	428	0.0092	423	0.0081	758	0.0096	687	0.0139	730	0.0254	505	0.0220	656	-	
1054	suprema-001	0.0041	285	0.0053	261	0.0038	480	0.0047	431	0.0060	471	0.0111	304	0.0095	397	0.0907	228
1055	suprema-002	0.0030	194	0.0041	178	0.0034	409	0.0040	363	0.0045	365	0.0085	220	0.0072	289	0.0781	181
1056	suprema-003	0.0028	176	0.0041	177	0.0034	407	0.0039	351	0.0030	210	0.3095	851	0.0580	820	0.6672	537

Table 76: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1057	suprema-004	0.0024	141	0.0035	129	0.0032	378	0.0036	320	0.0028	167	0.0053	92	0.0045	120	0.0625	102
1058	suprema-005	0.0022	118	0.0036	134	0.0034	420	0.0031	238	0.0026	153	0.0050	86	0.0044	108	0.0588	85
1059	supremaid-001	0.0053	364	0.0073	353	0.0045	541	0.0066	569	0.0099	639	0.0186	430	0.0148	543	0.1040	262
1060	supremaid-002	0.0063	427	0.0094	435	0.0044	534	0.0062	550	0.0072	524	0.0229	483	0.0095	396	0.2986	449
1061	surrey-cvssp-000	0.9084	1062	0.9909	1076	0.9923	1250	0.9950	1246	0.9981	1208	0.9994	1135	0.9979	1166	0.9998	724
1062	surrey-cvssp-001	1.0000	1242	1.0000	1257	0.0077	740	0.0079	636	0.0266	891	0.3822	880	0.0551	811	0.7285	552
1063	surrey-cvssp-002	0.0019	95	0.0028	90	0.0027	267	0.0028	171	0.0024	100	0.5978	933	0.1206	888	0.8488	587
1064	surrey-cvssp-003	0.0016	71	0.0028	89	0.0022	46	0.0024	83	0.0022	71	0.3048	846	0.0539	808	0.5830	519
1065	surrey-cvssp-004	-		-		0.0029	315	0.0025	124	0.0025	129	0.0690	694	0.0076	316	0.2741	441
1066	swsam-001	0.0268	793	0.0476	803	0.0271	1017	0.0460	1008	0.0584	998	0.7745	974	0.5013	1022	0.9642	636
1067	synesis-000	0.1752	955	0.3241	979	-		-		-		-		-		-	
1068	synesis-001	0.1777	956	1.0000	1252	1.0000	1337	-		-		-		-		-	
1069	synesis-003	0.8375	1057	0.8857	1063	0.8548	1235	0.9178	1231	-		-		-		-	
1070	synesis-004	0.0310	816	0.0480	805	0.0476	1070	0.0443	1002	0.0764	1018	-		-		-	
1071	synesis-005	0.0147	675	0.0226	671	0.0153	945	0.0226	911	0.0213	847	0.0375	602	0.0262	698	-	
1072	synesis-006	0.0070	460	0.0096	440	0.0107	845	0.0166	851	-		0.0128	337	0.0089	367	-	
1073	synesis-007	0.0050	337	0.0073	351	0.0062	672	0.0076	614	-		0.0105	288	0.0080	335	-	
1074	synology-000	0.0149	679	0.0238	685	0.0148	937	0.0261	935	0.0221	853	0.0331	562	0.0209	648	-	
1075	synology-001	0.0214	753	0.0307	730	0.0266	1016	0.0513	1027	0.0283	907	0.8884	1014	0.2589	958	-	
1076	synology-002	0.0104	580	0.0153	563	0.0107	847	0.0184	868	0.0189	818	0.2032	800	0.0180	601	-	
1077	syscake-000	-		-		0.0091	789	0.0155	824	0.0142	734	0.0287	528	0.0145	539	0.1682	370
1078	szpu-000	-		-		0.0034	410	0.0037	331	0.0039	311	0.8444	1003	0.3886	1000	0.8849	603
1079	sztu-000	0.0092	541	0.0139	536	0.0091	790	0.0201	892	0.0136	724	0.0685	693	0.0118	471	-	
1080	sztu-001	0.0031	196	0.0043	197	0.0025	173	0.0028	181	0.0051	412	0.0113	313	0.0089	369	0.9963	687
1081	t4isb-000	0.0058	385	0.0087	406	0.0041	520	0.0064	563	0.0083	568	0.0157	384	0.0103	423	0.1196	294
1082	tahakom-001	-		-		0.0223	991	0.0364	980	0.0361	940	1.0000	1177	0.9998	1188	1.0000	796
1083	taiwanmobile-001	-		-		0.2136	1151	0.3014	1149	0.3408	1109	0.9439	1044	0.7559	1073	0.9966	690
1084	taiwanmobile-002	-		-		0.0088	784	0.0114	727	0.0108	664	0.9776	1065	0.8683	1094	0.9998	723
1085	tcv-001	-		-		0.0301	1034	0.0556	1031	0.0570	996	0.1222	754	0.0786	840	0.3172	455
1086	tech5-000	0.0114	605	0.0160	576	-		-		-		-		-		-	
1087	tech5-001	0.0130	644	0.0176	607	0.0218	989	0.0419	996	0.0156	756	-		-		-	
1088	tech5-002	0.0046	315	0.0063	311	0.0113	870	0.0216	902	0.0233	866	0.9609	1050	0.7704	1075	-	
1089	tech5-003	0.0053	360	0.0070	336	0.0099	823	0.0185	870	0.0095	619	0.6670	948	0.1024	870	-	
1090	tech5-004	0.0123	627	0.0234	681	0.0086	779	0.0162	841	0.0065	495	0.0112	308	0.0082	345	-	
1091	tech5-005	0.0054	366	0.0072	341	0.0069	700	0.0122	745	0.0060	470	0.0094	256	0.0066	248	-	
1092	tech5-007	0.0020	105	0.0029	96	0.0024	120	0.0028	165	0.0034	265	0.8622	1007	0.5335	1028	0.9867	664
1093	tech5-008	0.0020	100	0.0031	107	0.0026	212	0.0028	176	0.0026	145	0.9238	1032	0.7170	1066	0.9984	698
1094	tech5-009	-		-		0.0041	514	0.0040	362	0.0045	369	0.0087	231	0.0080	332	0.0821	198
1095	techainer-001	0.0061	413	0.0092	425	0.0046	552	0.0073	603	0.0060	472	0.9575	1048	0.8567	1091	0.9995	714
1096	techainer-002	-		-		0.0058	643	0.0121	742	0.0136	725	0.0853	716	0.0313	728	0.1610	361
1097	techbiometricid-001	-		-		0.0877	1112	0.1663	1114	0.1000	1042	0.5946	931	0.3065	975	0.9792	652
1098	techsign-000	0.0325	823	0.0511	813	0.0435	1062	0.0710	1056	0.0746	1017	0.1104	742	0.0841	851	0.4288	486
1099	techsign-001	0.0110	594	0.0196	637	0.0067	692	0.0120	738	0.0087	583	0.2475	827	0.0883	858	0.6767	540
1100	telexper-000	-		-		0.0056	628	0.0077	619	0.0104	650	0.9976	1117	0.8691	1095	0.9999	735

Table 77: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1101	tevian-000	0.0871	908	0.1289	900	-		-		-		-		-		-	
1102	tevian-001	0.0813	907	0.1266	897	-		-		-		-		-		-	
1103	tevian-002	0.0279	800	0.0392	776	-		-		-		-		-		-	
1104	tevian-003	0.0217	756	0.0298	726	0.0230	999	0.0484	1019	-		-		-		-	
1105	tevian-004	0.0228	764	0.0304	729	0.0226	997	0.0478	1016	0.0128	703	0.0228	480	0.0138	522	-	
1106	tevian-005	0.0043	297	0.0062	299	0.0057	638	0.0085	658	0.0070	513	0.0135	342	0.0119	472	-	
1107	tevian-006	0.0045	307	0.0061	294	0.0045	547	0.0066	568	0.0046	384	0.0091	238	0.0075	308	-	
1108	tevian-007	0.0019	98	0.0027	80	0.0032	383	0.0041	374	0.0045	370	0.0086	225	0.0078	325	0.0925	240
1109	tevian-008	0.0012	40	0.0017	33	0.0033	388	0.0042	394	0.0042	339	0.0081	198	0.0068	260	0.0909	230
1110	tiger-001	0.3120	992	0.3974	994	-		-		-		-		-		-	
1111	tiger-002	0.0658	884	0.0889	874	0.1083	1121	0.1766	1118	0.0952	1037	0.1568	776	0.0661	828	-	
1112	tiger-003	0.0313	818	0.0602	835	0.0188	966	0.0359	978	0.0344	931	-		-		-	
1113	tiger-004	0.0779	899	0.1393	904	0.0488	1072	0.0905	1078	0.0800	1022	0.1640	779	0.0617	823	-	
1114	tiger-005	0.0624	878	0.2450	952	0.0292	1028	0.0556	1032	0.0430	963	1.0000	1163	0.9964	1158	1.0000	763
1115	tiger-006	0.0066	440	0.0101	463	0.0050	591	0.0075	613	0.0089	594	0.0158	387	0.0117	466	0.1466	341
1116	tiger-007	-		-		0.0041	519	0.0063	551	0.0088	589	0.7340	961	0.3935	1001	0.9464	627
1117	tinkoff-001	0.0145	672	0.0244	691	0.0318	1037	0.0636	1044	0.0236	873	1.0000	1348	0.0339	739	1.0000	1159
1118	tngd-001	-		-		0.0827	1107	0.1404	1106	0.0981	1041	0.1409	769	0.0808	847	0.7653	558
1119	tnitech-000	0.0025	153	0.0037	144	0.0033	393	0.0035	307	0.0025	116	0.8893	1015	0.6283	1044	0.9883	665
1120	tongyi-004	0.0428	846	0.0540	820	-		-		-		-		-		-	
1121	tongyi-005	0.0073	476	0.0146	548	0.0187	964	0.0421	997	0.0161	768	0.0215	463	0.0149	546	-	
1122	tongyitrans-001	0.0617	877	0.0715	850	-		-		-		-		-		-	
1123	tongyitrans-002	0.0437	849	0.0657	843	-		-		-		-		-		-	
1124	tongyitrans-003	0.0249	780	0.0474	801	-		-		-		-		-		-	
1125	toppanidgate-000	0.0021	112	0.0033	116	0.0026	206	0.0028	174	0.0039	316	0.0075	169	0.0068	256	0.0631	107
1126	toshiba-000	0.1906	962	0.2896	969	-		-		-		-		-		-	
1127	toshiba-001	0.1063	923	0.1926	933	-		-		-		-		-		-	
1128	toshiba-002	0.0134	652	0.0222	669	0.0097	817	0.0154	823	-		0.0327	558	0.0158	560	-	
1129	toshiba-003	0.0125	634	0.0214	656	0.0085	776	0.0131	767	-		0.0241	490	0.0151	551	-	
1130	toshiba-004	0.0030	186	0.0042	182	0.0025	172	0.0027	162	0.0034	262	0.0063	132	0.0053	175	0.0700	142
1131	toshiba-005	0.0023	133	0.0037	146	0.0024	126	0.0026	135	0.0072	522	0.0141	351	0.0130	499	0.0918	235
1132	toshiba-006	0.0022	127	0.0035	127	0.0024	138	0.0025	116	0.0027	160	0.7425	963	0.3070	976	0.9691	639
1133	toshiba-007	0.0016	66	0.0023	60	0.0024	145	0.0023	62	0.0021	53	0.0629	680	0.0056	190	0.2301	413
1134	toshiba-008	0.0012	44	0.0017	36	0.0024	130	0.0022	48	0.0019	40	0.0108	297	0.0039	80	0.0899	222
1135	toshiba-009	-		-		0.0024	118	0.0021	39	0.0019	38	0.0256	506	0.0055	189	0.1500	347
1136	toshiba-010	-		-		0.0024	103	0.0021	33	0.0017	20	0.0316	545	0.0053	171	0.1331	315
1137	toshiba-011	-		-		0.0024	129	0.0022	43	0.0019	35	0.0037	29	0.0033	34	0.0453	22
1138	toshiba-012	-		-		0.0022	52	0.0022	42	0.0019	34	0.0040	37	0.0034	36	0.0503	41
1139	toss-000	-		-		0.0023	56	0.0022	45	0.0021	54	0.0041	40	0.0035	40	0.0474	28
1140	touchlessid-000	0.3296	995	0.4804	1009	0.4111	1178	0.6026	1181	0.5324	1132	0.9996	1142	0.9964	1159	1.0000	774
1141	touchlessid-001	0.0076	486	0.0104	470	0.0680	1096	0.0842	1069	0.1358	1051	1.0000	1165	0.9995	1178	1.0000	820
1142	touchlessid-002	0.0070	461	0.0096	443	0.0407	1057	0.0469	1013	0.4234	1124	0.9991	1129	0.9953	1156	1.0000	766
1143	touchlessid-003	0.0061	414	0.0081	386	0.0040	506	0.0053	484	0.0056	447	0.0155	380	0.0082	344	0.1370	323
1144	touchlessid-004	-		-		0.0035	424	0.0049	443	0.0043	351	0.0077	178	0.0058	205	0.0793	185

Table 78: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1145	transmitsecurity-001	-		-		0.0051	599	0.0078	630	0.0089	595	0.0151	371	0.0111	448	0.1181	290
1146	trueface-000	0.0249	778	0.4321	999	0.0119	885	0.0180	864	0.0297	918	0.7467	965	0.1602	921	-	
1147	trueface-001	0.0204	749	0.0438	790	0.0095	811	0.0138	790	0.0154	752	0.0253	503	0.0169	580	-	
1148	trueface-002	0.0060	408	0.0096	441	0.0048	572	0.0061	544	0.0112	674	0.0198	447	0.0155	556	-	
1149	trueface-003	0.0070	458	0.0094	434	0.0053	608	0.0081	646	0.0122	692	0.0217	467	0.0159	562	0.1204	297
1150	trueidvng-001	0.0063	423	0.0077	367	0.0033	401	0.0044	410	0.0046	381	0.0086	228	0.0069	266	0.0809	193
1151	truststamp-001	0.0242	771	0.0484	807	0.0194	971	0.0359	977	0.0381	949	0.8808	1013	0.6898	1055	0.9948	679
1152	truststamp-002	-		-		0.0080	748	0.0138	791	0.0128	702	0.9718	1059	0.8779	1100	0.9998	722
1153	truststamp-003	-		-		0.0047	565	0.0070	589	0.0073	527	0.7132	957	0.4538	1013	0.9578	631
1154	ttigroup-000	-		-		0.0028	286	0.0034	281	0.0043	355	0.9208	1027	0.7608	1074	0.9975	696
1155	tuputech-000	0.3218	994	0.3696	989	-		-		0.3237	1107	0.4304	893	0.2973	974	-	
1156	turingtechvip-001	0.0330	827	0.0540	821	0.0458	1069	0.1007	1083	0.4715	1126	0.9286	1035	0.8448	1089	0.9964	689
1157	turingtechvip-002	0.0126	641	0.0163	581	0.0092	796	0.0118	732	0.2264	1092	1.0000	1256	0.9925	1150	0.9999	737
1158	turkcell-000	0.1134	928	0.1288	899	0.0770	1104	0.1112	1094	0.2570	1096	1.0000	1162	0.9999	1193	1.0000	792
1159	turkcell-001	0.0043	293	0.0066	318	0.0037	468	0.0055	498	0.0043	346	0.0440	620	0.0082	346	0.3148	454
1160	turkcell-002	-		-		0.0036	438	0.0053	482	0.0044	357	0.0371	597	0.0075	304	0.2871	447
1161	twface-000	0.0051	343	0.0072	346	0.0041	511	0.0058	515	0.0071	517	0.0153	377	0.0100	405	0.1595	356
1162	twface-001	0.0036	245	0.0051	248	0.0031	358	0.0038	339	0.0049	400	0.0091	243	0.0075	307	0.0831	200
1163	ulsee-001	0.0151	684	0.0246	693	0.0113	867	0.0185	873	0.0187	815	0.6766	949	0.0181	603	-	
1164	ultinous-000	0.2343	975	0.3484	984	-		-		-		-		-		-	
1165	ultinous-001	0.2485	980	0.4003	995	-		-		-		-		-		-	
1166	uluface-002	0.0081	505	0.0123	507	0.0071	707	0.0095	684	0.0107	657	1.0000	1242	0.0140	525	-	
1167	uluface-003	0.0100	565	0.0150	555	0.0079	744	0.0128	760	-		-		-		-	
1168	unicc-001	0.5101	1034	0.6167	1038	0.6577	1205	0.7894	1202	0.9208	1187	0.9866	1076	0.9386	1116	0.9999	740
1169	unicc-002	0.2153	972	0.2190	944	0.0417	1059	0.0526	1029	0.0891	1031	0.1321	762	0.1125	878	0.3813	472
1170	unicc-003	0.0217	757	0.0260	705	0.0093	802	0.0136	781	0.0129	705	0.0216	465	0.0143	533	0.2091	404
1171	unicc-004	-		-		0.0055	623	0.0077	621	0.0076	540	0.0147	364	0.0102	416	0.1421	333
1172	unissey-001	0.0095	551	0.0160	577	0.0134	912	0.0150	817	0.0147	744	0.0253	504	0.0163	569	0.1651	367
1173	unissey-002	0.0094	547	0.0151	557	0.0079	746	0.0110	719	0.0114	678	0.4424	896	0.1914	934	0.8051	575
1174	unissey-003	0.0057	378	0.0082	388	0.0047	563	0.0082	648	0.0067	500	0.5179	909	0.2863	970	0.8684	591
1175	unissey-004	0.0043	292	0.0066	317	0.0037	452	0.0052	473	0.0048	396	0.5272	914	0.2903	971	0.8777	597
1176	unissey-005	-		-		0.0037	451	0.0052	472	0.0086	578	0.0161	393	0.0134	506	0.1006	254
1177	unissey-006	-		-		0.0073	717	0.0121	743	0.0288	910	0.0529	655	0.0464	790	0.2808	443
1178	upc-001	0.0234	767	0.0519	816	0.0291	1026	0.0490	1023	0.0294	915	0.2316	818	0.0389	762	-	
1179	urielsoft-000	-		-		0.0026	219	0.0032	252	0.0043	348	0.0083	207	0.0068	262	0.0744	157
1180	useb-000	0.0158	693	0.0222	668	0.0123	893	0.0168	855	0.0182	805	0.0289	530	0.0167	578	0.1614	362
1181	useb-001	0.0035	242	0.0053	260	0.0027	257	0.0033	273	0.0027	162	0.0085	222	0.0044	107	0.0806	190
1182	useb-002	0.0028	177	0.0039	160	0.0027	255	0.0031	237	0.0025	114	0.0090	235	0.0042	98	0.0867	206
1183	useb-003	-		-		0.0026	197	0.0030	205	0.0025	109	0.0091	242	0.0042	99	0.0901	225
1184	useb-004	-		-		0.0025	185	0.0028	186	0.0022	61	0.5197	912	0.2232	947	0.8470	585
1185	uxlabs-001	0.0534	861	0.0570	828	0.0118	881	0.0131	766	0.0237	876	0.0399	612	0.0288	718	0.2097	406
1186	uxlabs-003	0.2133	971	0.2143	940	0.0386	1050	0.0457	1006	0.0374	947	0.3343	858	0.1554	917	0.6941	544
1187	uzinfocom-000	-		-		0.0070	704	0.0120	740	0.0086	577	0.9874	1080	0.9469	1119	0.9999	727
1188	vaidio-001	-		-		0.0135	913	0.0166	850	0.0079	549	0.6587	945	0.4279	1008	0.9123	615

Table 79: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)																	
		CONSTRAINED, COOPERATIVE																LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1189	vcog-002	0.7522	1053	0.9033	1067	-		-		-		-		-		-	
1190	vcortex-001	0.0131	649	0.0207	647	0.0192	969	0.0315	962	0.2238	1091	0.3586	870	0.3536	990	0.3569	462
1191	vd-000	0.3790	1005	0.4973	1013	-		-		-		-		-		-	
1192	vd-001	0.0243	773	0.0452	794	0.0271	1019	0.0402	990	0.0424	961	-		-		-	
1193	vd-002	0.0429	847	0.0704	848	0.0569	1085	0.0844	1070	0.0801	1023	0.0937	721	0.0577	819	-	
1194	vd-003	0.0199	746	0.0222	667	0.0115	876	0.0130	765	0.0138	728	0.0239	488	0.0177	597	0.1647	366
1195	veridas-001	0.1998	969	0.2724	959	0.2987	1163	0.4587	1166	0.2599	1097	0.2454	825	0.1357	899	-	
1196	veridas-002	0.1733	954	0.2257	947	0.2617	1160	0.4147	1160	0.2073	1083	0.2028	799	0.1112	877	-	
1197	veridas-003	0.0557	870	0.0983	883	0.0734	1100	0.1267	1102	0.0694	1014	0.0951	727	0.0480	794	-	
1198	veridas-004	0.0281	801	0.0467	800	0.0353	1046	0.0643	1047	0.0424	960	0.0644	681	0.0342	740	-	
1199	veridas-005	0.0599	874	0.1110	891	0.0294	1032	0.0639	1045	0.0811	1026	0.1130	744	0.0548	810	-	
1200	veridas-006	0.0098	557	0.0167	590	0.0079	747	0.0127	754	0.0127	699	0.0217	466	0.0151	550	0.1573	352
1201	veridas-007	0.0063	426	0.0083	395	0.0044	537	0.0058	519	0.0080	559	0.0152	375	0.0120	478	0.1199	296
1202	veridas-008	0.0032	209	0.0045	210	0.0030	324	0.0033	268	0.0085	576	0.0206	453	0.0143	534	0.1228	301
1203	veridas-009	0.0031	195	0.0043	188	0.0030	337	0.0035	301	0.0055	434	0.0106	292	0.0100	406	0.0959	248
1204	veridas-010	-		-		0.0027	266	0.0033	272	0.0042	340	0.0080	197	0.0073	290	0.0649	120
1205	veridium-000	0.0726	892	0.1248	896	0.5226	1189	0.6652	1188	0.6425	1139	0.8150	990	0.7989	1082	0.8772	596
1206	veridium-001	0.0274	797	0.0368	767	0.0292	1029	0.0475	1014	0.0488	977	0.0673	688	0.0463	788	0.3691	468
1207	veridium-002	0.0343	829	0.0427	786	0.0283	1023	0.0460	1009	0.0489	978	0.0673	687	0.0464	789	0.3658	464
1208	veridium-003	-		-		0.0286	1024	0.0462	1010	0.0492	979	0.0679	691	0.0470	792	0.3672	465
1209	verigram-000	0.0032	206	0.0043	190	0.0031	344	0.0034	284	0.0093	612	0.0175	415	0.0164	573	0.1158	287
1210	verigram-001	0.0032	211	0.0044	201	0.0027	253	0.0032	253	0.0030	200	0.9995	1138	0.9953	1155	1.0000	813
1211	verigram-002	0.0079	499	0.0089	416	0.0038	475	0.0040	365	0.0060	473	0.0113	314	0.0107	435	0.0634	109
1212	verigram-003	0.0101	568	0.0109	481	0.0034	412	0.0039	354	0.0037	294	0.0070	160	0.0063	233	0.0559	67
1213	verihubs-inteligensia-000	0.0070	459	0.0098	448	0.0048	574	0.0076	618	0.0092	605	0.0160	390	0.0117	464	0.1348	319
1214	verihubs-inteligensia-001	0.0071	462	0.0114	496	0.0050	587	0.0076	617	0.0096	622	0.0165	402	0.0114	457	0.1409	331
1215	verihubs-inteligensia-002	0.0028	173	0.0043	191	0.0025	193	0.0030	207	0.0047	389	0.0092	244	0.0083	352	0.0983	250
1216	verijelas-000	0.2488	981	0.3431	982	0.4861	1187	0.6004	1180	0.0811	1025	0.1148	746	0.0440	780	0.4077	481
1217	via-000	0.0216	754	0.0365	765	0.0177	961	0.0287	950	0.0296	916	0.0572	661	0.0290	721	-	
1218	via-001	0.0149	680	0.0229	675	0.0114	874	0.0177	862	0.0183	809	0.4056	886	0.0176	594	-	
1219	via-004	0.0099	562	0.0135	531	0.0031	364	0.0044	411	0.0055	439	0.4009	884	0.0080	336	0.9840	659
1220	via-005	0.0063	422	0.0082	390	0.0031	346	0.0037	337	0.0032	232	0.3659	872	0.0068	257	0.8709	594
1221	via-006	-		-		0.0025	151	0.0027	148	0.0025	132	0.5904	929	0.0315	729	0.9455	626
1222	viante-000	0.0004	6	0.0007	5	0.0026	224	0.0026	138	0.0017	18	0.0033	11	0.0029	14	0.0475	31
1223	viante-001	-		-		0.0025	191	0.0025	108	0.0016	9	0.0031	7	0.0028	11	0.0432	14
1224	viante-002	-		-		0.0025	158	0.0024	85	0.0015	5	0.0029	4	0.0027	5	0.0399	6
1225	videmo-000	0.0298	810	0.0423	783	0.0155	948	0.0260	933	0.0246	883	0.0397	611	0.0239	676	-	
1226	videmo-001	0.0295	807	0.0417	780	0.0164	957	0.0261	936	0.0355	937	0.0603	674	0.0442	782	0.2428	423
1227	videmo-002	0.0158	695	0.0288	718	0.0149	942	0.0249	926	0.0230	861	0.3429	862	0.1468	908	0.8393	583
1228	videmo-003	-		-		0.0082	762	0.0138	789	0.0133	715	0.0220	471	0.0119	475	0.1596	358
1229	videonetics-001	0.5483	1036	0.6446	1041	0.7517	1225	0.8607	1219	0.8664	1172	0.8255	994	0.6956	1057	-	
1230	videonetics-002	0.4274	1013	0.5329	1020	0.6081	1201	0.7438	1196	0.7775	1153	0.7297	960	0.5756	1035	-	
1231	viettelai-004	-		-		0.0023	86	0.0028	179	0.0023	80	0.0044	53	0.0034	37	0.0566	72
1232	viettelhightech-000	0.0117	613	0.0166	587	0.0110	856	0.0198	890	0.0167	783	0.0249	497	0.0158	559	0.1604	360

Table 80: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1233	viettelhightech-001	-		-		0.0031	359	0.0040	369	0.0032	240	0.0063	131	0.0051	152	0.0781	180
1234	viettelhightech-002	-		-		0.0031	342	0.0042	396	0.0033	244	0.0061	127	0.0051	150	0.0758	168
1235	vigilantsolutions-000	-		0.6881	1047	-		-		-		-		-		-	
1236	vigilantsolutions-001	-		0.3475	983	-		-		-		-		-		-	
1237	vigilantsolutions-002	0.2290	974	0.3214	977	-		-		-		-		-		-	
1238	vigilantsolutions-003	0.1878	961	0.2673	958	-		-		-		-		-		-	
1239	vigilantsolutions-004	0.1780	957	0.2598	956	-		-		-		-		-		-	
1240	vigilantsolutions-005	0.1613	951	0.4702	1007	0.0163	955	0.0279	946	-		-		-		-	
1241	vigilantsolutions-006	0.1264	934	0.3221	978	0.0150	943	0.0254	927	0.0493	981	0.2991	843	0.0403	767	-	
1242	vigilantsolutions-007	0.0202	748	0.0307	731	0.0136	914	0.0227	912	0.0356	939	1.0000	1205	1.0000	1312	-	
1243	vigilantsolutions-008	0.0156	690	0.0233	678	0.0101	827	0.0147	811	0.0355	938	0.0492	643	0.0293	723	-	
1244	vigilantsolutions-009	0.0117	612	0.0165	585	0.0075	732	0.0101	701	0.0219	852	0.0385	606	0.0238	675	-	
1245	vigilantsolutions-010	0.0109	591	0.0164	582	0.0074	727	0.0095	681	0.0209	843	0.0365	595	0.0233	670	0.2465	424
1246	vigilantsolutions-011	0.0124	632	0.0176	606	0.0073	718	0.0095	680	0.0196	833	0.0360	587	0.0221	657	0.2633	436
1247	vinai-000	0.0081	506	0.0124	511	0.0045	539	0.0072	598	0.0089	593	0.1814	787	0.0112	450	-	
1248	vinbigdata-001	0.2576	984	0.2763	961	0.1404	1136	0.1988	1129	0.1407	1056	0.1150	747	0.0703	835	0.3688	467
1249	vinbigdata-002	0.0102	573	0.0175	602	0.0071	711	0.0084	654	0.0090	597	0.8017	983	0.3134	978	0.9936	677
1250	vinbigdata-003	0.0771	897	0.0992	884	0.1202	1129	0.1756	1117	0.2762	1101	0.2369	822	0.0100	407	0.8914	609
1251	vinbigdata-004	-		-		0.0031	348	0.0046	420	0.0037	296	0.1476	772	0.0063	236	0.4917	500
1252	vinbigdata-005	-		-		0.0023	58	0.0024	91	0.0022	60	0.0068	153	0.0038	65	0.0699	141
1253	vinbigdata-006	-		-		0.0022	51	0.0023	73	0.0019	44	0.0037	28	0.0032	28	0.0479	32
1254	vinbigdata-007	-		-		0.0022	34	0.0021	34	0.0019	42	0.0036	26	0.0032	27	0.0475	29
1255	vion-000	0.0419	843	0.0590	832	0.0422	1060	0.0478	1017	0.0581	997	0.0968	731	0.0847	852	-	
1256	visage-000	0.0933	912	0.1441	911	0.1316	1133	0.2416	1135	0.1395	1053	0.1920	793	0.1001	867	-	
1257	visica-001	-		-		0.2293	1154	0.3588	1154	0.2936	1104	0.3564	869	0.1967	936	0.7795	565
1258	visica-002	-		-		0.0520	1079	0.0898	1076	0.2960	1105	0.8202	992	0.5956	1040	0.9838	657
1259	visionbox-000	0.0293	804	0.0541	822	0.0197	973	0.0339	966	0.0349	933	0.0593	670	0.0329	734	-	
1260	visionbox-001	0.0159	697	0.0270	711	0.0111	860	0.0173	857	0.0190	820	0.0315	543	0.0205	642	-	
1261	visionbox-002	0.0058	388	0.0079	376	0.0060	654	0.0074	604	0.0084	573	0.0149	367	0.0113	454	0.0979	249
1262	visionbox-003	0.0057	381	0.0075	357	0.0062	670	0.0083	651	0.0100	643	0.9915	1089	0.9625	1129	1.0000	746
1263	visionbox-004	0.0046	318	0.0075	359	0.0060	658	0.0075	611	0.0056	444	0.0316	544	0.0070	276	0.2528	427
1264	visionbox-005	-		-		0.0041	508	0.0057	509	0.0046	385	0.0109	299	0.0088	365	0.0767	172
1265	visionbox-006	-		-		0.0063	674	0.0075	608	0.0048	394	0.0116	319	0.0094	390	0.0789	183
1266	visionlabs-001	0.1049	922	0.1803	925	-		-		-		-		-		-	
1267	visionlabs-002	0.0326	824	0.0507	812	-		-		-		-		-		-	
1268	visionlabs-003	0.0178	723	0.0293	722	-		-		-		-		-		-	
1269	visionlabs-004	0.0219	759	0.0457	796	-		-		-		-		-		-	
1270	visionlabs-005	0.0088	525	0.0156	571	0.0048	569	0.0070	590	-		-		-		-	
1271	visionlabs-006	0.0037	255	0.0066	316	0.0041	518	0.0060	533	0.0061	478	0.0106	293	0.0076	317	-	
1272	visionlabs-007	0.0038	262	0.0048	228	0.0036	442	0.0048	436	0.0057	452	0.0097	266	0.0071	280	-	
1273	visionlabs-008	0.0026	158	0.0036	138	0.0031	367	0.0040	368	0.0045	372	0.0079	191	0.0064	237	-	
1274	visionlabs-009	0.0018	87	0.0025	69	0.0026	205	0.0029	201	0.0035	269	0.0064	134	0.0054	181	-	
1275	visionlabs-010	0.0017	74	0.0024	62	0.0026	223	0.0030	216	0.0033	252	0.0061	125	0.0052	163	-	
1276	visionlabs-011	0.0012	41	0.0022	54	0.0024	140	0.0026	136	0.0028	169	0.0053	93	0.0046	125	0.0635	110

Table 81: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1277	visteam-000	0.9200	1064	0.9489	1071	0.9959	1252	0.9984	1247	0.9994	1212	0.9978	1118	0.9914	1149	-	
1278	visteam-001	0.4417	1018	0.5385	1023	0.6410	1204	0.7788	1201	0.6386	1138	0.5904	927	0.4023	1004	-	
1279	visteam-002	0.1564	949	0.2789	963	0.1581	1141	0.2567	1140	0.1776	1071	0.2090	805	0.1021	869	0.5820	518
1280	visteam-003	0.0804	905	0.2166	941	0.0613	1091	0.1204	1098	0.0963	1038	0.1269	759	0.0441	781	0.6049	524
1281	visteam-004	0.0541	864	0.5202	1017	0.0406	1056	0.0827	1067	0.1879	1074	0.1795	786	0.0347	743	0.9673	638
1282	visteam-005	0.0235	768	0.0333	746	0.0265	1015	0.0583	1039	0.0341	930	0.0524	653	0.0259	692	0.2413	421
1283	visteam-006	0.0188	733	0.0256	701	0.0158	952	0.0365	981	0.0198	836	0.0340	575	0.0174	592	0.1904	389
1284	visteam-007	0.0312	817	0.0448	793	0.0416	1058	0.1008	1084	0.0466	973	0.0602	673	0.0281	709	0.2601	433
1285	visteam-008	0.0378	837	0.0515	814	0.0391	1053	0.0937	1081	0.0437	966	0.0567	660	0.0260	694	0.2533	428
1286	visteam-009	-		-		0.0138	918	0.0304	957	0.0166	779	0.9993	1134	0.9719	1134	0.9997	718
1287	visteam-010	-		-		0.0156	950	0.0347	972	0.0189	817	1.0000	1182	0.9996	1180	1.0000	745
1288	vivotek-001	-		-		0.9982	1254	0.9994	1249	1.0000	1218	1.0000	1184	0.9999	1195	1.0000	772
1289	vivotek-002	-		-		0.0761	1103	0.1380	1104	0.9587	1194	1.0000	1186	1.0000	1202	1.0000	805
1290	vixvizion-000	0.0642	883	0.0882	873	0.0497	1075	0.0905	1077	0.0848	1028	0.1026	733	0.0618	824	-	
1291	vixvizion-001	0.0245	775	0.0407	778	0.0257	1011	0.0497	1024	0.0514	984	0.0656	684	0.0400	766	-	
1292	vixvizion-002	0.0062	420	0.0086	404	0.0053	611	0.0075	609	0.0121	689	0.0207	454	0.0161	565	-	
1293	vixvizion-003	0.0059	404	0.0084	399	0.0059	649	0.0081	643	0.0119	685	0.0209	456	0.0162	566	-	
1294	vixvizion-004	0.0063	421	0.0094	433	0.0055	626	0.0081	644	0.0098	635	0.0157	385	0.0111	447	0.1417	332
1295	vixvizion-005	0.0276	798	0.0420	782	0.0302	1035	0.0629	1043	0.0288	911	0.0447	623	0.0235	672	0.2304	414
1296	vixvizion-006	0.0082	511	0.0122	506	0.0093	798	0.0194	883	0.0099	638	0.0169	407	0.0108	439	0.1338	317
1297	vixvizion-007	0.0110	596	0.0191	627	0.0080	751	0.0157	826	0.0101	645	0.0190	436	0.0118	470	0.1407	330
1298	vnis-000	0.1397	942	0.1608	917	0.2184	1153	0.2976	1147	0.5277	1131	0.3603	871	0.2714	964	0.6929	542
1299	vnpay-000	0.2380	977	0.2614	957	0.4054	1177	0.4968	1169	0.3993	1121	0.4389	894	0.4006	1003	0.7693	561
1300	vnpay-001	-		-		0.0026	225	0.0030	209	0.0065	494	0.0124	330	0.0116	463	0.0826	199
1301	vnpt-001	0.3117	991	0.3523	985	0.3474	1170	0.2747	1142	0.3405	1108	0.5015	904	0.4827	1018	-	
1302	vnpt-002	0.0351	833	0.0424	784	0.0220	990	0.0316	963	0.0471	974	0.0817	712	0.0698	834	0.2610	434
1303	vnpt-003	0.0117	611	0.0138	535	0.0040	503	0.0058	526	0.0087	582	0.0161	396	0.0126	488	0.1110	275
1304	vnpt-004	0.0058	392	0.0078	373	0.0037	462	0.0053	480	0.0051	414	0.4640	899	0.1384	901	0.7753	563
1305	vnpt-005	0.0036	244	0.0052	252	0.0027	254	0.0031	230	0.0036	280	0.0066	146	0.0056	192	0.0621	100
1306	vnpt-006	0.0034	235	0.0050	240	0.0027	245	0.0035	312	0.0026	148	0.0049	82	0.0040	91	0.0585	79
1307	vnpt-007	-		-		0.0025	184	0.0029	194	0.0025	128	0.0047	64	0.0039	78	0.0564	70
1308	vnpt-008	-		-		0.0026	202	0.0029	192	0.0025	133	0.0047	70	0.0040	82	0.0570	74
1309	vnpt-009	-		-		0.0030	317	0.0042	390	0.0030	206	0.0053	94	0.0042	100	0.0628	103
1310	vocalize-001	-		-		0.7356	1220	0.8750	1226	0.7830	1156	0.7067	956	0.5268	1027	0.9164	619
1311	vocord-001	-		0.1415	910	-		-		-		-		-		-	
1312	vocord-002	0.0228	765	0.0341	751	-		-		-		-		-		-	
1313	vocord-003	0.1003	916	0.1092	889	-		-		-		-		-		-	
1314	vocord-004	0.0101	570	0.0174	600	0.0196	972	0.0384	986	-		-		-		-	
1315	vocord-005	0.0089	526	0.0155	569	0.0216	988	0.0414	995	-		-		-		-	
1316	vocord-006	0.0062	418	0.0102	465	0.0082	759	0.0151	818	0.0475	975	0.0852	715	0.0788	841	-	
1317	vocord-007	0.0039	266	0.0053	262	0.0061	663	0.0094	679	0.0520	987	0.0939	724	0.0910	860	-	
1318	vocord-008	0.0029	179	0.0038	156	0.0042	523	0.0055	493	0.0045	375	0.0086	229	0.0073	294	-	
1319	vocord-009	0.0022	122	0.0029	97	0.0036	434	0.0046	426	0.0052	422	0.0098	269	0.0086	362	-	
1320	vocord-010	0.0024	144	0.0031	106	0.0036	435	0.0049	455	0.0025	134	0.0065	138	0.0040	84	0.0679	135

Table 82: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	FALSE NON-MATCH RATE (FNMR)															
		CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1321	vsoft-001	-		-		0.0707	1099	0.0877	1072	0.8390	1167	0.9519	1045	0.9506	1121	0.9655	637
1322	vsoft-002	-		-		0.0451	1068	0.0679	1052	0.0550	993	0.3671	874	0.1633	924	0.8586	588
1323	vtcc-000	0.0051	348	0.0068	329	0.0054	613	0.0064	560	0.9451	1191	1.0000	1272	1.0000	1367	1.0000	859
1324	vtcc-001	0.0054	367	0.0076	364	0.0049	582	0.0079	635	0.0064	491	0.0225	476	0.0083	348	1.0000	937
1325	vtcc-002	-		-		0.0029	312	0.0041	378	0.0069	506	0.0126	334	0.0074	299	0.1095	268
1326	vtcc-003	-		-		0.0034	414	0.0041	382	0.2038	1079	0.3193	857	0.1067	874	0.8681	590
1327	vts-000	0.0103	574	0.0174	598	0.0080	750	0.0129	764	0.0250	885	0.0450	626	0.0372	757	-	
1328	vts-001	0.0033	216	0.0048	229	0.0027	261	0.0036	321	0.0032	233	0.6519	943	0.3563	992	0.9218	622
1329	vts-002	-		-		0.0025	153	0.0032	257	0.0030	201	0.0113	311	0.0042	101	0.1593	355
1330	wicket-000	0.0018	91	0.0028	88	0.0024	134	0.0027	149	0.0031	216	0.7968	982	0.4340	1010	0.9788	650
1331	winsense-000	0.0140	666	0.0228	674	0.0125	896	0.0215	901	0.0226	858	0.8091	986	0.0461	787	-	
1332	winsense-001	0.0062	417	0.0099	455	0.0092	794	0.0210	897	0.0093	611	0.0144	360	0.0098	402	-	
1333	winsense-002	0.0050	340	0.0073	352	0.0038	476	0.0059	528	0.0064	490	0.0118	324	0.0084	353	-	
1334	wiseai-001	0.0658	885	0.0964	882	0.7743	1230	0.8956	1228	0.1967	1077	0.7526	968	0.3419	987	0.9695	640
1335	wuhantianyu-001	0.0163	702	0.0262	707	0.0281	1022	0.0569	1036	0.0316	926	0.0486	641	0.0344	741	0.2097	405
1336	x-laboratory-000	0.0071	464	0.0106	473	0.0123	892	0.0138	788	0.0419	959	0.5629	921	0.2852	969	-	
1337	x-laboratory-001	0.0059	399	0.0110	484	0.0054	615	0.0078	632	0.0094	615	0.0142	353	0.0100	409	-	
1338	xforwardai-000	0.0050	336	0.0072	342	0.0036	445	0.0051	471	0.0074	531	0.0136	344	0.0105	430	-	
1339	xforwardai-001	0.0021	108	0.0034	120	0.0027	268	0.0028	178	0.0046	383	0.0088	233	0.0079	327	-	
1340	xforwardai-002	0.0016	65	0.0023	56	0.0026	238	0.0025	110	0.0040	326	0.0081	201	0.0074	297	-	
1341	xm-000	0.0015	56	0.0026	76	0.0031	354	0.0038	345	0.0058	460	0.0105	290	0.0082	347	-	
1342	yisheng-000	0.1215	932	0.1990	936	-		-		-		-		-		-	
1343	yisheng-001	0.0892	909	0.1600	916	-		-		-		-		-		-	
1344	yisheng-002	0.2241	973	0.3795	991	-		-		-		-		-		-	
1345	yisheng-004	0.1988	967	0.3329	980	0.1147	1126	0.1849	1123	0.2044	1080	-		-		-	
1346	yitu-000	0.0284	802	0.0330	743	-		-		-		-		-		-	
1347	yitu-001	0.0050	334	0.0074	356	-		-		-		-		-		-	
1348	yitu-002	0.0025	155	0.0043	195	-		-		-		-		-		-	
1349	yitu-003	0.0015	58	0.0026	70	0.0066	688	0.0085	655	0.0064	492	0.0114	316	0.0103	424	-	
1350	yoonik-000	0.0070	456	0.0112	488	0.0074	725	0.0118	734	0.0564	995	0.2013	797	0.1160	881	-	
1351	yoonik-001	0.0057	380	0.0079	375	0.0043	532	0.0061	540	0.0307	921	0.0762	706	0.0556	814	-	
1352	yoonik-002	0.0052	355	0.0062	305	0.0029	316	0.0034	289	0.0615	1004	0.1279	760	0.1166	882	0.2329	417
1353	yoonik-003	0.0034	228	0.0047	220	0.0032	377	0.0037	328	0.0816	1027	0.2033	801	0.1601	920	0.3210	457
1354	yoonik-004	0.0041	286	0.0059	285	0.0033	390	0.0052	475	0.0040	328	0.0071	162	0.0051	157	0.0732	149
1355	yoti-001	0.0139	664	0.0195	634	0.0110	857	0.0187	877	0.0191	821	0.1255	757	0.0415	771	0.5578	512
1356	yoti-002	-		-		0.0076	735	0.0137	784	0.0106	654	0.3375	859	0.1599	919	0.7672	560
1357	ytu-000	0.0057	382	0.0087	410	0.0121	889	0.0238	920	0.0047	391	0.0078	185	0.0059	214	-	
1358	yuan-000	0.0101	571	0.0168	591	0.0077	737	0.0127	757	0.0178	798	0.5189	911	0.0245	683	-	
1359	yuan-001	0.0116	609	0.0220	663	0.0114	872	0.0184	869	0.0149	747	0.0574	662	0.0160	564	-	
1360	yuan-002	0.0094	548	0.0154	567	0.0071	709	0.0110	722	0.0108	665	0.0348	578	0.0127	493	0.5738	516
1361	yuan-003	0.0078	493	0.0111	485	0.0062	671	0.0091	671	0.0106	655	0.0511	648	0.0123	485	0.7337	553
1362	yuan-004	0.0058	397	0.0078	370	0.0039	493	0.0055	497	0.0234	867	0.0442	622	0.0353	746	0.1673	369
1363	yuan-005	0.0037	257	0.0046	217	0.0027	270	0.0035	309	0.0033	245	0.2706	838	0.0876	857	0.6695	538
1364	yuan-006	0.0045	303	0.0062	303	0.0032	371	0.0049	447	0.0038	306	0.0084	215	0.0049	138	0.1211	298

Table 83: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

		FALSE NON-MATCH RATE (FNMR)															
	Algorithm	CONSTRAINED, COOPERATIVE														LESS CONSTRAINED, NON-COOP.	
	Name	VISAMC		VISA		MUGSHOT		MUGSHOT12+YRS		VISABORDER		BORDER		BORDER		KIOSKBORDER	
	FMR	0.0001		1E-06		1E-05		1E-05		1E-06		1E-06		1E-05		1E-06	
1365	yuan-007	0.0046	311	0.0069	332	0.0045	544	0.0075	610	0.0072	520	0.0144	359	0.0076	310	0.1081	267
1366	yuan-008	0.0032	213	0.0043	192	0.0026	216	0.0034	280	0.0028	175	0.0059	114	0.0039	77	0.0891	216
1367	yuan-009	-		-		0.0028	283	0.0042	393	0.0030	204	0.0057	101	0.0040	87	0.0733	151
1368	yuan-010	-		-		0.0028	280	0.0041	373	0.0030	215	0.0058	108	0.0041	94	0.0748	164

Table 84: FNMR is the proportion of mated comparisons below a threshold set to achieve the FMR given in the header on the fourth row. FMR is the proportion of impostor comparisons at or above that threshold. The light grey values give rank over all algorithms in that column. The pink columns use only same-sex impostors; others are selected regardless of demographics. The exception, in the green column, uses "matched-covariates" i.e. impostors of the same sex, age group, and country of birth. The second pink column includes effects of extended ageing. Missing entries for border, visa, mugshot and wild images generally mean the algorithm did not run to completion. The VISA *columns compare images described in section 2.1. The* MUGSHOT *columns compare images described in section 2.5. The* VISA-BORDER *column compare images described in section 2.2 with those of section 2.4. The* BORDER *column compares images described in section 2.4. The* KIOSK-BORDER *columns compare images described in section 2.6 with those of section 2.4.*

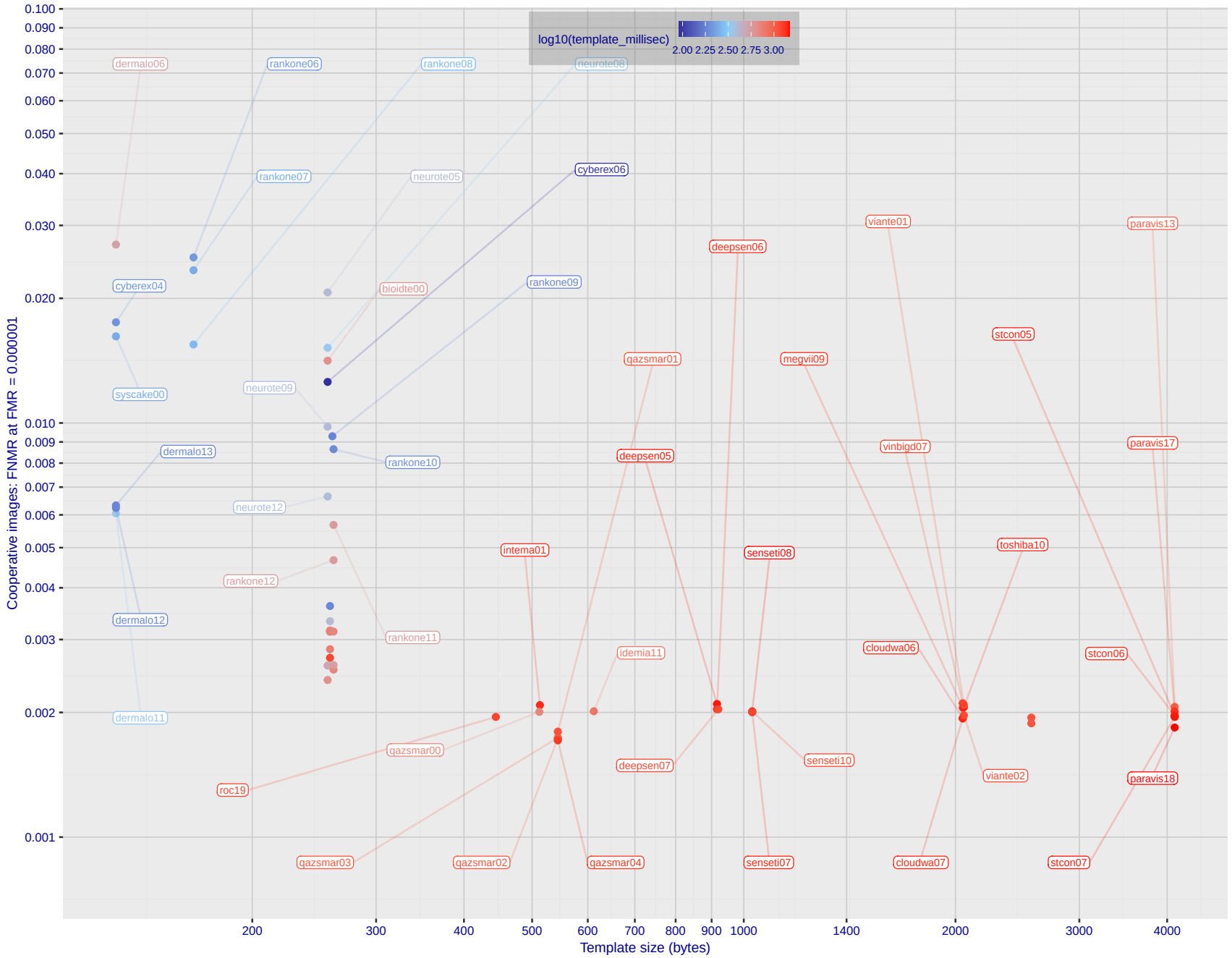


Figure 1: The points show false non-match rates (FNMR) versus the size of the encoded template. FNMR is the geometric mean of FNMR values for visa-border and mugshot images (from Figs. 214 and 278) at the false match rate (FMR) given in the y-axis label. The color of the points encodes template generation time - which spans at least one order of magnitude. Durations are measured on a single core of a c. 2016 Intel Xeon CPU E5-2630 v4 running at 2.20GHz. Algorithms with poor FNMR are omitted.

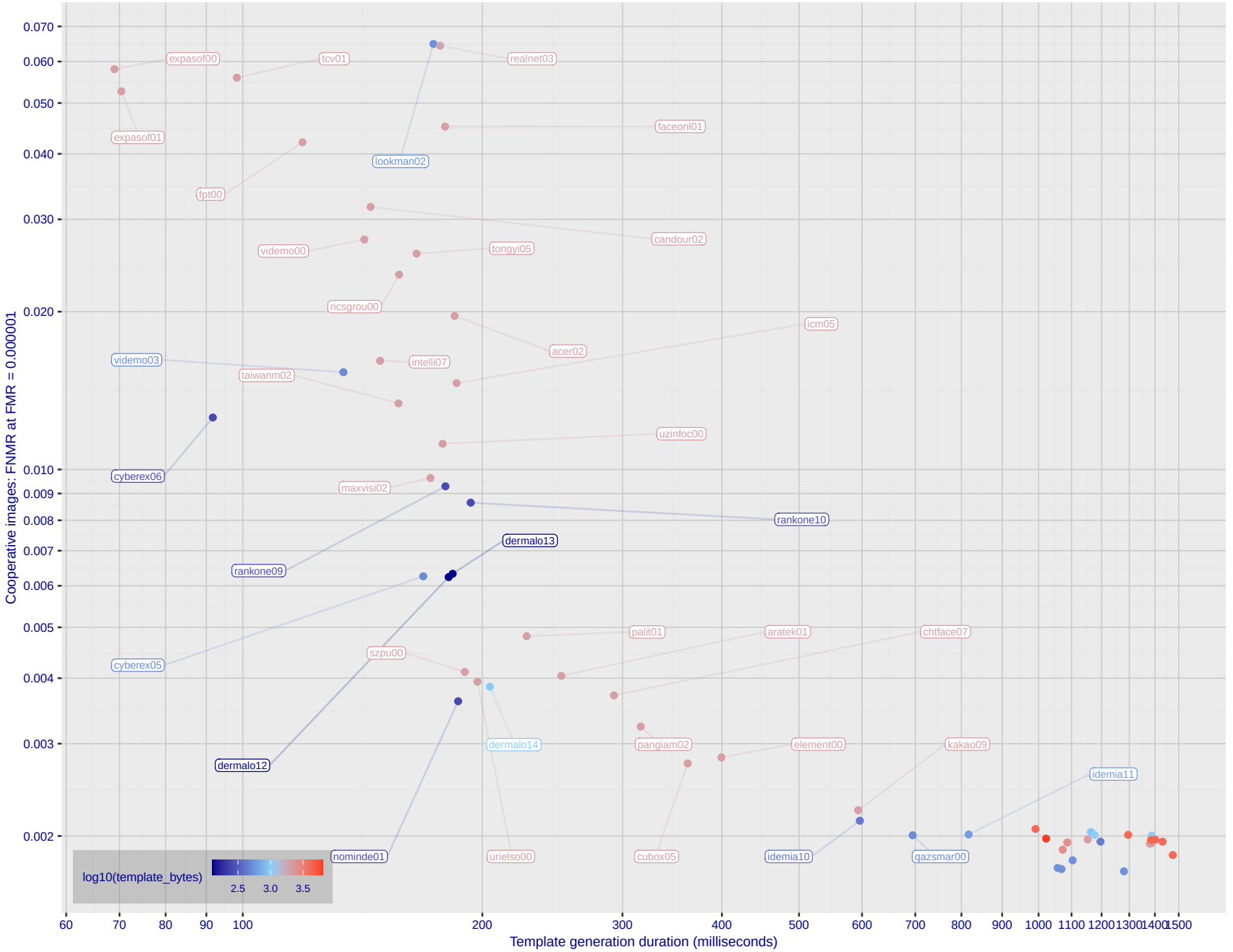


Figure 2: The points show false non-match rates (FNMR) versus the duration of the template generation operation. FNMR is the geometric mean of FNMR values for visa-border and mugshot images (from Figs. 214 and 278) at a false match rate (FMR) given in the y-axis label. Template generation time is a median estimated over 640 x 480 pixel portraits. It is measured on a single core of a c. 2016 Intel Xeon CPU E5-2630 v4 running at 2.20GHz. The color of the points encodes template size - which spans two orders of magnitude. Algorithms with poor FNMR are omitted.

1 Metrics

1.1 Core accuracy

Given a vector of N genuine scores, u, the false non-match rate (FNMR) is computed as the proportion below some threshold, T:

$$\text{FNMR}(T) = 1 - \frac{1}{N}\sum_{i=1}^{N} H(u_i - T) \tag{1}$$

where $H(x)$ is the unit step function, and $H(0)$ taken to be 1.

Similarly, given a vector of N impostor scores, v, the false match rate (FMR) is computed as the proportion above T:

$$\text{FMR}(T) = \frac{1}{N}\sum_{i=1}^{N} H(v_i - T) \tag{2}$$

The threshold, T, can take on any value. We typically generate a set of thresholds from quantiles of the observed impostor scores, v, as follows. Given some interesting false match rate range, $[\text{FMR}_L, \text{FMR}_U]$, we form a vector of K thresholds corresponding to FMR measurements evenly spaced on a logarithmic scale

$$T_k = Q_v(1 - \text{FMR}_k) \tag{3}$$

where Q is the quantile function, and FMR_k comes from

$$\log_{10}\text{FMR}_k = \log_{10}\text{FMR}_L + \frac{k}{K}\ [\log_{10}\text{FMR}_U - \log_{10}\text{FMR}_L] \tag{4}$$

Error tradeoff characteristics are plots of FNMR(T) vs. FMR(T). These are plotted with $\text{FMR}_U \to 1$ and FMR_L as low as is sustained by the number of impostor comparisons, N. This is somewhat higher than the "rule of three" limit $3/N$ because samples are not independent, due to re-use of images.

1.2 Multi-template scoring methodology

There are some scenarios when one or more people exist and are detected in an image, and some of the proposed test images include K $>$ 1 persons for some images and situations where the subject of interest may or may not be the foreground face (largest face in the image). The NIST FRTE 1:1 API supports this by allowing generation of multiple templates representing each person detected in an image. When this occurs, NIST will match all templates generated from the enrollment image with all templates generated from the verification image and use the **maximum** similarity score across all template comparisons. This scoring approach will be used in our calculation of FMR and FNMR (this applies to both genuine and imposter comparisons).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

2 Datasets

2.1 Visa images

- The number of images is on the order of 10^5.
- The number of subjects is on the order of 10^5.
- The number of subjects with two images is on the order of 10^4.
- The images have geometry in reasonable conformance with the ISO/IEC 19794-5 Full Frontal image type. Pose is generally excellent.
- The images are of size 252x300 pixels. The mean interocular distance (IOD) is 69 pixels.
- The images are of subjects from greater than 100 countries, with significant imbalance due to visa issuance patterns.
- The images are of subjects of all ages, including children, again with imbalance due to visa issuance demand.
- Many of the images are live capture. A substantial number of the images are photographs of paper photographs.
- When these images are input to the algorithm, they are labelled as being of type "ISO" - see Table 4 of the FRTE API.

2.2 Application images

- The number of images is on the order of 10^6.
- The number of subjects is on the order of 10^6.
- The number of subjects with two images is on the order of 10^6.
- The images have geometry in good conformance with the ISO/IEC 19794-5 Full Frontal image type. Pose is generally excellent.
- The images are of size 300x300 pixels. The mean interocular distance (IOD) is 61 pixels.
- The images are of subjects from greater than 100 countries, with significant imbalance due to population and immigration patterns.
- The images are of subjects of adults.
- All of the images are live capture.
- When these images are input to the algorithm, they are labelled as being of type "ISO" - see Table 4 of the FRTE API.

2.3 Application images with head yaw

- The number of images is on the order of 10^5.
- The number of subjects is on the order of 10^5.
- The number of subjects with two images is on the order of 10^5.
- The images have geometry in good conformance with the ISO/IEC 19794-5 Full Frontal image type *except* the yaw angle is between 25 and 85 degrees. Our pose estimates are approximate, with an angular error that increases with yaw. The angular estimates will be improved over time.
- The images are of size 300x300 pixels. The mean interocular distance (IOD), if frontal, would be about pixels, but reduces with cosine of yaw.
- The images are of subjects from greater than 100 countries, with significant imbalance due to population and immigration patterns.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- ▷ The images are of subjects of adults.
- ▷ All of the images are live capture.
- ▷ When these images are input to the algorithm, they are labelled as being of type ”WILD” - see Table 4 of the FRTE API.

2.4 Border crossing images

- ▷ The number of images is on the order of 10^6.
- ▷ The number of subjects is on the order of 10^6.
- ▷ The number of subjects with two images is on the order of 10^6.
- ▷ The images are taken with at camera oriented by an attendant toward a cooperating subject. This is done under time constraints so there are role, pitch and yaw angle variations. Also background illumination is sometimes strong, so the face is under-exposed. There is some perspective distortion due to close range images. Some faces are partially cropped.
- ▷ The images have mean IOD of 38 pixels.
- ▷ The images are of subjects of adults and childen aged 12 or above.
- ▷ The images are of subjects from greater than 100 countries, with significant imbalance due to population and immigration patterns.
- ▷ The images are all live capture.
- ▷ When these images are input to the algorithm, they are labelled as being of type ”WILD” - see Table 4 of the FRTE API.

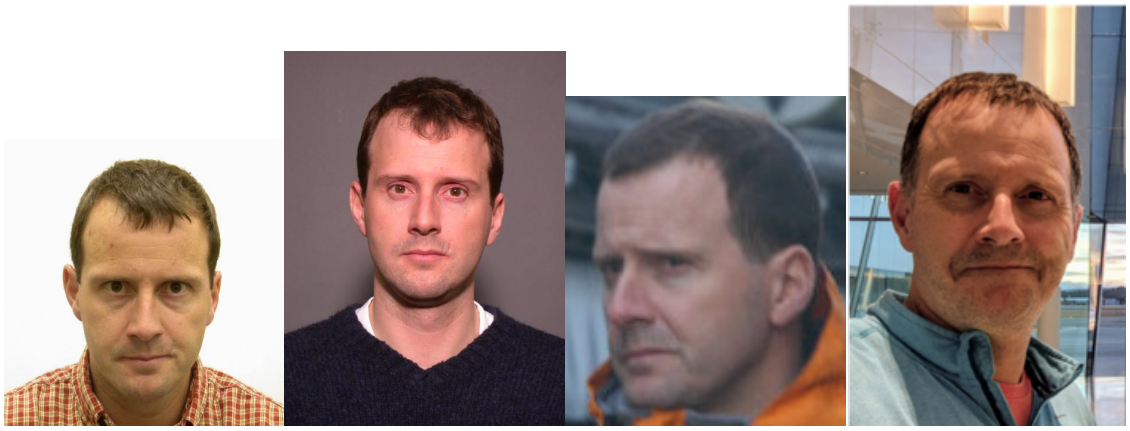
2.5 Mugshot images

- ▷ The number of images is on the order of 10^6.
- ▷ The number of subjects is on the order of 10^6.
- ▷ The number of subjects with two images is on the order of 10^6.
- ▷ The images have geometry in reasonable conformance with the ISO/IEC 19794-5 Full Frontal image type.
- ▷ The images are of variable sizes. The median IOD is 105 pixels. The mean IOD is 113 pixels. The 1-st, 5-th, 10-th, 25-th, 75-th, 90-th and 99-th percentiles are 34, 58, 70, 87, 121, 161 and 297 pixels.
- ▷ The images are of subjects from the United States.
- ▷ The images are of adults.
- ▷ The images are all live capture.
- ▷ When these images are input to the algorithm, they are labelled as being of type ”mugshot” - see Table 4 of the FRTE API.

2.6 Kiosk images

- ▷ The number of images is on the order of 10^6.
- ▷ The number of subjects is on the order of 10^5.
- ▷ The number of subjects with multiple images is the order of 10^5.

FNMR(T) “False non-match rate”
FMR(T) “False match rate”



(a) Visa (b) Mugshot (c) Wild (d) Border

Figure 3: The figure gives simulated samples of image types used in this report.

- The images are taken at kiosk equipped with a camera intended to capture a centered face. However the images have specific quality defects arising from the camera triggering before the subject looks at it. These are downward pitch of the face relative to the optical axis; cropping of the forehead; and cropping of left or right part of the face. Partial cropping affects perhaps 10% of the images. Resolution does not vary widely.
- The images are of adults.
- The images have mean IOD of 44 pixels, with maximum below 75, and minimum when both eyes are present above 25 pixels.
- All of the images are live capture, none are scanned.
- When these images are input to the algorithm, they are labelled as being of type ”WILD” - see Table 4 of the FRTE API.

2.7 Wild images

- The number of images is on the order of 10^5.
- The number of subjects is on the order of 10^4.
- The number of subjects with two images on the order of 10^4.
- The images include many photojournalism-style images. Images are given to the algorithm using a variable but generally tight crop of the head. Resolution varies very widely. The images are very unconstrained, with wide yaw and pitch pose variation. Faces can be occluded, including hair and hands.
- The images are of adults.
- All of the images are live capture, none are scanned.
- When these images are input to the algorithm, they are labelled as being of type ”WILD” - see Table 4 of the FRTE API.

3 Results

3.1 Test goals

- To state absolute accuracy for different kinds of images, including those with and without subject cooperation.

FNMR(T) “False non-match rate”
FMR(T) “False match rate”

▷ To state comparative accuracy, across algorithms.

3.2 Test design

Method: For visa images:

▷ The comparisons are of visa photos against visa photos.
▷ The number of genuine comparisons is on the order of 10^4.
▷ The number of impostor comparisons is on the order of 10^{10}.
▷ The comparisons are fully zero-effort, meaning impostors are paired without attention to sex, age or other covariates. However, later analysis is conducted on subsets.
▷ The number of persons is on the order of 10^5.
▷ The number of images used to make a template is one.
▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.

Method: For mugshot images:

▷ The comparisons are of mugshot photos against mugshot photos.
▷ The number of genuine comparisons is on the order of 10^6.
▷ The number of impostor comparisons is on the order of 10^8.
▷ The impostors are paired by sex, but not by age or other covariates.
▷ The number of persons is on the order of 10^6.
▷ The number of images used to make a template is one.
▷ The number of templates used to make each comparison score is two, corresponding to simple one-to-one verification.

Method: For visa-border comparisons:

▷ The comparisons are of visa-like frontals against border crossing webcam photos.
▷ The number of genuine comparisons is on the order of 10^6.
▷ The number of impostor comparisons is on the order of 10^8.
▷ The impostors are paired by sex, but not by age or other covariates.
▷ The number of persons is on the order of 10^6.
▷ The number of images used to make a template is one.
▷ The number of templates used to make each comparison score is two, corresponding to simple one-to-one verification.

Method: For visa-border non-frontal yaw comparisons:

▷ The comparisons are of visa-like images with yaw 25 to 85 degrees against border crossing webcam photos.
▷ The number of genuine comparisons is on the order of 10^5.
▷ The number of impostor comparisons is on the order of 10^8.
▷ The impostors are paired by sex, but not by age or other covariates.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- ▷ The number of persons is on the order of 10^5.
- ▷ The number of images used to make a template is one.
- ▷ The number of templates used to make each comparison score is two, corresponding to simple one-to-one verification.

Method: For kiosk-border comparisons:

- ▷ The comparisons are of visa-like frontals against kiosk-style photos.
- ▷ The number of genuine comparisons is on the order of 10^6.
- ▷ The number of impostor comparisons is on the order of 10^8.
- ▷ The impostors are paired by sex, but not by age or other covariates.
- ▷ The number of persons is on the order of 10^5.
- ▷ The number of images used to make a template is one.
- ▷ The number of templates used to make each comparison score is two, corresponding to simple one-to-one verification.

Method: For border-border comparisons:

- ▷ The comparisons are of border crossing webcam photos.
- ▷ The number of genuine comparisons is on the order of 10^6.
- ▷ The number of impostor comparisons is on the order of 10^8.
- ▷ The impostors are paired by sex, but not by age or other covariates.
- ▷ The number of persons is on the order of 10^6.
- ▷ The number of images used to make a template is one.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.

Method: For wild images:

- ▷ The comparisons are of wild photos against wild photos.
- ▷ The number of genuine comparisons is on the order of 10^6.
- ▷ The number of impostor comparisons is on the order of 10^8.
- ▷ The comparisons are fully zero-effort, meaning impostors are paired without attention to sex, age or other covariates.
- ▷ The number of persons is on the order of 10^4.
- ▷ The number of images used to make a template is one.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.

Method: For child exploitation images:

- ▷ The comparisons are of unconstrained child exploitation photos against others of the same type.
- ▷ The number of genuine comparisons is on the order of 10^4.
- ▷ The number of impostor comparisons is on the order of 10^7.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

- ▷ The comparisons are fully zero-effort, meaning impostors are paired without attention to sex, age or other covariates.
- ▷ The number of persons is on the order of 10^3.
- ▷ The number of images used to make 1 template is 1.
- ▷ The number of templates used to make each comparison score is two corresponding to simple one-to-one verification.
- ▷ We produce two performance statements. First, is a DET as used for visa and mugshot images. The second is a cumulative match characteristic (CMC) summarizing a simulated one-to-many search process. This is done as follows.
  - We regard M enrollment templates as items in a gallery.
  - These M templates come from $M > N$ individuals, because multiple images of a subject are present in the gallery under separate identifiers.
  - We regard the verification templates as search templates.
  - For each search we compute the rank of the highest scoring mate.
  - This process should properly be conducted with a 1:N algorithm, such as those tested in NIST IR 8009. We use the 1:1 algorithms in a simulated 1:N mode here to a) better reflect what a child exploitation analyst does, and b) to show algorithm efficacy is better than that revealed in the verification DETs.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.3 Failure to enroll

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
1	2060io-001	0.0160	1205	0.0998	1206	0.4698	848	0.0193	1265	-	1147
2	2060io-002	0.0000	949	0.0015	865	0.0238	558	0.0028	1223	-	1155
3	20face-000	0.0000	606	0.0008	622	0.0217	510	0.0000	333	0.0004	616
4	20face-001	0.0000	779	0.0008	623	0.0000	16	0.0000	343	0.0004	609
5	3divi-000	-	1307	-	1332	-	997	-	1338	0.0008	933
6	3divi-001	-	1327	-	1362	-	1048	-	1344	0.0007	923
7	3divi-002	-	1304	-	1338	-	1000	-	1333	0.0010	952
8	3divi-003	0.0001	1119	0.0059	1109	-	1343	0.0007	1111	0.0006	893
9	3divi-004	0.0001	1120	0.0059	1110	-	1052	0.0008	1126	0.0006	899
10	3divi-005	0.0000	815	0.0008	597	-	1293	0.0000	455	0.0002	272
11	3divi-006	0.0000	539	0.0007	546	0.0214	507	0.0001	652	0.0002	279
12	3divi-007	0.0000	803	0.0007	548	0.0214	506	0.0001	656	0.0002	277
13	accurascan-001	0.0001	1111	0.0060	1113	0.0838	810	0.0006	1100	0.0022	1030
14	accurascan-002	0.0001	1112	0.0060	1114	0.0838	811	0.0006	1101	0.0022	1031
15	accurascan-003	0.0000	553	0.0009	705	0.0226	528	0.0000	456	0.0003	402
16	acer-000	0.0000	979	0.0024	973	-	887	0.0002	831	0.0004	735
17	acer-001	0.0000	595	0.0011	776	-	1178	0.0001	578	0.0004	656
18	acer-002	0.0000	1028	0.0008	606	0.0191	450	0.0003	920	0.0004	642
19	acisw-003	0.0000	72	0.0000	94	-	1334	0.0000	71	0.0000	167
20	acisw-006	0.0000	78	0.0000	93	-	1327	0.0000	67	0.0000	166
21	acisw-007	0.0000	432	0.0000	139	0.0000	23	0.0000	268	0.0000	105
22	acisw-008	0.0000	594	0.0009	685	0.0173	401	0.0004	1013	0.0004	445
23	adera-001	0.0000	975	0.0034	1041	-	1112	0.0003	938	0.0005	860
24	adera-002	0.0000	977	0.0034	1042	-	1160	0.0003	939	0.0005	862
25	adera-003	0.0000	978	0.0034	1043	0.0403	722	0.0003	940	0.0005	858
26	adera-004	0.0000	557	0.0008	602	0.0202	467	0.0003	968	0.0004	572
27	adera-005	0.0000	799	0.0008	603	0.0202	466	0.0003	969	0.0004	562
28	advance-002	0.0000	718	0.0013	839	-	1072	0.0000	544	0.0004	640
29	advance-003	0.0000	938	0.0012	799	0.0247	571	0.0001	715	0.0004	744
30	advance-004	0.0001	1117	0.0010	750	0.0157	373	0.0008	1136	0.0006	900
31	advance-005	0.0000	791	0.0003	295	0.0074	212	0.0002	823	0.0003	290
32	affinsys-ai-000	0.0000	1038	0.0068	1117	0.0641	773	0.0016	1188	-	1114
33	afisbiometrics-000	0.0000	622	0.0008	582	0.0213	504	0.0000	332	0.0004	654
34	afrengine-000	0.0000	688	0.0015	869	0.0254	591	0.0008	1133	0.0004	507
35	afrengine-001	0.0000	787	0.0007	565	0.0183	420	0.0005	1046	0.0004	741
36	afrengine-002	0.0000	617	0.0007	564	0.0183	421	0.0005	1045	0.0004	745
37	afrengine-003	0.0000	764	0.0099	1143	0.0384	707	0.0005	1047	-	1226
38	afrengine-004	0.0000	485	0.1602	1209	0.0528	749	0.0005	1044	-	1254
39	afrengine-005	0.0000	540	0.0012	810	0.0232	550	0.0006	1085	-	1269
40	aifirst-001	0.0000	219	0.0000	37	-	1157	0.0000	135	0.0000	223
41	aigen-001	0.0000	9	0.0000	62	-	1258	0.0000	28	0.0000	130
42	aigen-002	0.0000	88	0.0000	100	0.0000	122	0.0000	59	0.0000	155
43	aigroup-000	0.0000	115	0.0005	389	0.0103	260	0.0000	40	-	1273
44	aigroup-001	0.0000	832	0.0005	404	0.0104	263	0.0001	763	-	1274
45	ailabs-001	0.0000	652	0.0090	1140	-	963	0.0007	1124	0.0005	797
46	aimall-001	0.0000	8	0.0000	63	-	1257	0.0000	26	0.0000	131
47	aimall-002	0.0000	981	0.0043	1074	-	1224	0.0012	1165	0.0005	848
48	aimall-003	0.0000	913	0.0012	813	-	1170	0.0004	989	0.0005	786
49	aiseemu-001	0.0000	214	0.0000	39	0.0000	91	0.0000	139	0.0000	226
50	aiseemu-002	0.0000	93	0.0000	98	0.0000	119	0.0000	62	0.0000	162
51	aiunionface-000	0.0000	41	0.0000	75	-	1290	0.0000	14	0.0000	119
52	aize-001	0.0001	1118	0.0040	1059	0.0652	775	0.0026	1219	0.0022	1029
53	aize-002	0.0000	60	0.0014	857	0.0230	545	0.0005	1082	0.0004	610
54	aize-003	0.0000	354	0.0000	240	0.0001	142	0.0000	180	0.0000	241
55	ajou-001	0.0000	781	0.0020	939	-	909	0.0001	663	0.0004	749
56	alchera-000	0.0000	1080	0.0041	1071	-	1024	0.0004	1010	0.0014	1006
57	alchera-001	0.0000	1081	0.0041	1070	-	1012	0.0004	1011	0.0014	1007
58	alchera-002	0.0000	753	0.0008	633	-	877	0.0001	741	0.0004	482

Table 85: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
59	alchera-003	0.0001	1139	0.0013	835	0.0317	646	0.0002	857	0.0004	669
60	alchera-004	0.0000	749	0.0009	679	0.0228	531	0.0001	740	0.0004	510
61	alchera-005	0.0000	662	0.0009	682	0.0228	534	0.0001	737	0.0004	502
62	alchera-006	0.0000	564	0.0009	675	0.0228	536	0.0001	735	0.0004	523
63	alchera-007	0.0000	700	0.0009	683	0.0228	535	0.0001	739	0.0004	505
64	alchera-008	0.0000	623	0.0009	677	0.0228	538	0.0001	736	-	1345
65	alchera-009	0.0000	798	0.0004	378	0.0112	287	0.0002	841	-	1208
66	alfabeta-001	0.0005	1164	0.0650	1197	0.2142	839	0.0024	1212	0.0018	1020
67	alice-000	0.0000	321	0.0006	454	0.0133	320	0.0000	411	0.0004	479
68	alice-001	0.0000	280	0.0006	453	0.0133	319	0.0000	406	0.0004	478
69	alleyes-000	0.0000	668	0.0010	730	-	1021	0.0002	768	0.0004	686
70	allgovision-000	0.0007	1171	0.0062	1115	-	1216	0.0026	1217	0.0052	1069
71	alphaface-001	0.0000	808	0.0012	791	-	934	0.0000	553	0.0004	692
72	alphaface-002	0.0000	613	0.0012	788	-	1199	0.0000	548	0.0004	703
73	alttekglobal-000	0.0000	800	0.0020	933	0.0471	735	0.0000	557	-	1197
74	amplifiedgroup-001	0.0114	1201	0.1023	1207	-	880	0.0189	1264	0.0279	1084
75	androvideo-000	0.0000	449	0.0000	163	-	953	0.0000	242	0.0000	85
76	anke-000	-	1325	-	1355	-	1017	-	1325	0.0021	1025
77	anke-001	-	1238	-	1278	-	1325	-	1295	0.0047	1068
78	anke-002	-	1364	-	1323	-	948	0.0004	997	0.0009	939
79	anke-003	-	1275	-	1233	-	1152	0.0001	681	0.0004	580
80	anke-004	0.0000	739	0.0011	771	-	901	0.0001	687	0.0004	710
81	anke-005	0.0000	660	0.0012	796	-	1035	0.0001	721	0.0004	731
82	antheus-000	0.0000	286	0.0000	195	-	1038	0.0000	154	0.0000	10
83	antheus-001	0.0000	300	0.0000	191	-	1025	0.0000	156	0.0000	14
84	antheus-002	0.0000	1067	0.0015	867	0.0213	498	0.0044	1240	-	1173
85	anyvision-001	-	1319	-	1341	-	960	-	1330	0.0091	1077
86	anyvision-002	0.0060	1192	0.0230	1168	-	1240	0.0070	1253	0.0090	1076
87	anyvision-004	0.0000	945	0.0017	901	-	1200	0.0001	720	0.0004	633
88	anyvision-005	0.0000	562	0.0013	821	-	1105	0.0000	471	0.0004	496
89	aratek-001	0.0000	435	0.0000	154	0.0000	18	0.0000	252	0.0000	92
90	armatura-001	0.0000	1003	0.0021	951	0.0257	596	0.0005	1066	0.0005	818
91	armatura-002	0.0000	936	0.0018	908	0.0206	477	0.0003	970	0.0004	742
92	armatura-003	0.0000	645	0.0012	801	0.0333	671	0.0004	1005	0.0004	583
93	arvis-000	0.0008	1175	0.0014	850	0.0195	458	0.0083	1255	-	1096
94	asr-000	0.0000	890	0.0007	550	0.0152	358	0.0002	886	-	1216
95	asr-001	0.0000	859	0.0006	494	0.0138	325	0.0002	902	-	1118
96	asusaics-000	0.0000	75	0.0000	91	-	1330	0.0000	70	0.0000	164
97	asusaics-001	0.0000	317	0.0000	211	-	1059	0.0000	199	0.0000	52
98	autentika-000	0.0000	57	0.0000	83	0.0000	117	0.0000	5	0.0000	111
99	autentika-001	0.0000	133	0.0000	7	0.0000	81	0.0000	105	0.0000	195
100	autentika-002	0.0000	374	0.0000	131	0.0000	7	0.0000	218	0.0000	66
101	autentika-003	0.0000	180	0.0000	22	0.0000	89	0.0000	83	-	1312
102	authenmetric-002	0.0000	277	0.0000	183	-	977	0.0000	165	0.0000	18
103	authenmetric-003	0.0000	116	0.0000	115	0.0000	131	0.0000	41	0.0000	144
104	authenmetric-004	0.0000	239	0.0000	55	0.0000	99	0.0000	115	0.0000	207
105	authme-001	0.0000	1035	0.0009	695	0.0245	569	0.0003	960	0.0005	782
106	authme-002	0.0000	845	0.0007	571	0.0179	410	0.0001	714	-	1319
107	aware-000	-	1253	-	1290	-	1363	-	1287	0.0005	802
108	aware-001	-	1235	-	1267	-	1271	-	1272	0.0002	261
109	aware-002	-	1254	-	1289	-	1360	-	1290	0.0006	872
110	aware-003	-	1315	-	1343	-	967	0.0016	1186	0.0013	996
111	aware-004	0.0000	819	0.0023	963	-	1270	0.0002	798	0.0005	779
112	aware-005	0.0000	870	0.0020	937	-	1053	0.0001	767	0.0004	709
113	aware-006	0.0000	653	0.0009	665	0.0249	576	0.0000	483	0.0004	620
114	aware-007	0.0000	566	0.0012	802	0.0325	658	0.0000	491	0.0004	672
115	aware-008	0.0000	736	0.0012	808	0.0327	660	0.0000	494	-	1185
116	awiros-001	0.0039	1184	0.0369	1185	-	1321	0.0386	1268	0.0872	1089

Table 86: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
117	awiros-002	0.0000	1031	0.0038	1055	-	1312	0.0007	1120	0.0012	995
118	awiros-003	0.0000	132	0.0000	6	0.0000	82	0.0000	104	-	1335
119	awiros-004	0.0000	471	0.0000	168	0.0000	29	0.0000	240	-	1201
120	aximetria-001	0.0000	852	0.0010	755	0.0217	511	0.0001	765	0.0004	617
121	ayftech-001	0.0002	1147	0.0046	1081	-	896	0.0043	1239	0.0011	961
122	ayftech-003	0.0000	218	0.0006	504	0.0123	303	0.0000	136	0.0000	224
123	ayonix-000	0.0053	1189	0.0341	1181	-	944	0.0113	1259	0.0137	1079
124	beethedata-000	0.0005	1160	0.0042	1072	0.0366	693	0.0002	804	0.0010	948
125	betaface-000	-	1326	-	1361	-	1050	-	1345	0.0011	965
126	betaface-002	-	1292	-	1245	-	1163	-	1319	0.0010	950
127	beyneai-000	0.0000	252	0.0000	51	0.0000	96	0.0000	117	0.0000	210
128	biocube-001	0.0006	1166	0.0391	1186	0.1207	820	0.0015	1180	0.0020	1024
129	biocube-002	0.0000	644	0.0046	1084	0.0721	799	0.0008	1132	0.0012	985
130	bioid-001	0.0005	1162	0.0019	928	0.0324	657	0.0005	1057	-	1224
131	bioid-002	0.0000	378	0.0000	128	0.0000	4	0.0000	214	-	1175
132	bioid-003	0.0000	224	0.0000	45	0.0000	104	0.0000	126	-	1348
133	bioidtechswiss-000	0.0000	579	0.0008	587	-	1142	0.0003	931	0.0004	755
134	bioidtechswiss-001	0.0000	629	0.0007	538	-	1007	0.0000	431	0.0004	675
135	bioidtechswiss-002	0.0000	490	0.0007	545	-	1229	0.0000	439	0.0004	663
136	bioidtechswiss-003	0.0000	909	0.0202	1163	0.0980	815	0.0005	1060	-	1310
137	biometric-vision-000	0.0000	743	0.0005	401	0.0107	278	0.0002	888	0.0004	538
138	biometrik-001	0.0000	65	0.0000	81	0.0000	115	0.0000	13	-	1241
139	bm-001	0.0000	269	0.0000	171	-	987	0.0000	282	0.0000	29
140	boetech-001	0.0087	1197	0.0272	1173	0.2117	837	0.0032	1227	0.0160	1080
141	boetech-002	0.0087	1198	0.0272	1172	0.2117	836	0.0032	1228	0.0160	1081
142	bresee-000	0.0000	773	0.0010	742	-	918	0.0002	807	0.0003	361
143	bresee-001	0.0000	600	0.0010	741	-	1169	0.0002	805	0.0003	368
144	bresee-002	0.0000	963	0.0020	944	0.0219	518	0.0008	1125	0.0004	581
145	btsdigital-001	0.0000	10	0.0009	662	0.0265	606	0.0000	378	-	1256
146	cakevn-001	0.0000	373	0.0007	554	0.0130	315	0.0000	229	-	1190
147	camvi-001	-	1311	-	1349	-	980	-	1327	0.0010	955
148	camvi-002	0.0000	314	0.0000	212	-	1061	0.0000	202	0.0000	53
149	camvi-003	-	1232	-	1271	-	1279	0.0000	7	0.0000	114
150	camvi-004	0.0000	271	0.0000	237	-	982	0.0000	167	0.0000	23
151	candour-001	0.0000	316	0.0000	210	0.0000	59	0.0000	200	0.0000	51
152	candour-002	0.0000	411	0.0000	146	0.0000	27	0.0000	263	-	1228
153	candour-003	0.0000	69	0.0000	80	0.0000	113	0.0000	9	-	1240
154	candour-004	0.0000	428	0.0000	142	0.0000	20	0.0000	266	-	1231
155	canon-002	0.0000	179	0.0000	23	-	1148	0.0000	84	0.0000	179
156	canon-003	0.0000	776	0.0008	584	0.0234	552	0.0000	532	0.0004	647
157	canon-004	0.0000	620	0.0008	583	0.0234	553	0.0000	530	0.0004	652
158	canon-005	0.0000	359	0.0044	1076	0.0269	611	0.0000	436	0.0004	540
159	cchonolulu-000	0.0054	1190	0.0395	1188	0.2802	844	0.0036	1231	0.0012	983
160	cchonolulu-001	0.0056	1191	0.0414	1189	0.2894	846	0.0038	1236	0.0012	987
161	cdachyd-001	0.0005	1161	0.0639	1193	0.2112	835	0.0023	1207	-	1322
162	ceiec-001	-	1322	-	1351	-	1031	0.0029	1225	0.0023	1035
163	ceiec-002	0.0002	1146	0.0056	1106	-	1070	0.0036	1232	0.0031	1051
164	ceiec-003	0.0000	15	0.0013	842	-	1250	0.0001	599	0.0004	681
165	ceiec-004	0.0000	293	0.0008	620	-	1028	0.0000	460	0.0004	501
166	celloscope-001	0.0000	1011	0.0056	1105	0.0540	752	0.0022	1204	-	1267
167	chosun-000	0.0000	70	0.0000	79	-	1264	0.0000	8	0.0000	117
168	chosun-001	0.0000	311	0.0000	198	-	1014	0.0000	150	0.0000	5
169	chosun-002	0.0000	288	0.0000	194	-	1036	0.0000	152	0.0000	9
170	chtface-001	0.0000	134	0.0000	10	-	1115	0.0000	101	0.0000	200
171	chtface-002	0.0000	1026	0.0021	953	-	1254	0.0002	910	0.0007	915
172	chtface-003	0.0000	974	0.0018	912	-	939	0.0001	620	0.0006	873
173	chtface-004	0.0000	17	0.0017	894	0.0320	651	0.0000	498	0.0004	697
174	chtface-005	0.0000	161	0.0017	892	0.0320	649	0.0000	503	0.0004	702

Table 87: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
175	chtface-006	0.0000	298	0.0017	895	0.0320	648	0.0000	506	0.0004	687
176	chtface-007	0.0000	217	0.0017	893	0.0320	650	0.0000	504	-	1358
177	chtface-008	0.0000	676	0.0009	649	0.0221	520	0.0000	451	-	1151
178	chtface-009	0.0000	521	0.0009	648	0.0221	521	0.0000	443	-	1291
179	cib-000	0.0000	228	0.0000	47	-	1208	0.0001	743	0.0000	214
180	cib-001	0.0000	56	0.0000	85	-	1277	0.0000	4	0.0000	109
181	cist-001	0.0000	104	0.0005	436	0.0087	246	0.0000	47	0.0000	149
182	cist-002	0.0000	431	0.0048	1086	0.0128	309	0.0000	265	0.0000	106
183	cist-003	0.0000	131	0.0011	768	0.0343	682	0.0000	106	0.0000	196
184	cist-004	0.0000	362	0.0005	405	0.0108	280	0.0000	226	0.0000	73
185	clearviewai-000	0.0000	504	0.0003	301	0.0081	228	0.0000	508	0.0003	315
186	clearviewai-001	0.0000	719	0.0006	475	0.0174	403	0.0001	560	0.0004	450
187	clearviewai-002	0.0000	836	0.0009	702	0.0244	564	0.0001	586	-	1327
188	clearviewai-003	0.0000	864	0.0009	703	0.0244	563	0.0001	591	-	1105
189	closeli-001	0.0000	371	0.0000	119	0.0000	8	0.0000	228	0.0000	77
190	cloudmatrix-000	0.0000	810	0.0012	803	-	1259	0.0001	583	0.0004	464
191	cloudmatrix-001	0.0000	869	0.0028	992	0.0225	524	0.0001	594	0.0004	453
192	cloudmatrix-002	0.0000	841	0.0028	991	0.0225	525	0.0001	585	0.0004	471
193	cloudwalk-hr-000	-	1314	-	1346	-	974	0.0003	954	0.0008	929
194	cloudwalk-hr-001	0.0000	488	0.0007	561	-	1231	0.0001	565	0.0004	567
195	cloudwalk-hr-002	0.0000	705	0.0007	559	-	1076	0.0002	846	0.0004	707
196	cloudwalk-hr-003	0.0000	480	0.0008	625	-	1251	0.0001	617	0.0004	486
197	cloudwalk-hr-004	0.0000	560	0.0011	785	-	1110	0.0004	999	0.0003	416
198	cloudwalk-mt-000	0.0000	491	0.0008	596	-	1226	0.0002	847	0.0004	711
199	cloudwalk-mt-002	0.0000	533	0.0003	294	-	1365	0.0001	566	0.0004	466
200	cloudwalk-mt-003	0.0000	630	0.0007	527	-	1009	0.0002	836	0.0004	705
201	cloudwalk-mt-004	0.0000	727	0.0009	638	0.0191	448	0.0002	863	0.0004	739
202	cloudwalk-mt-005	0.0000	671	0.0005	417	0.0130	316	0.0003	914	0.0004	704
203	cloudwalk-mt-006	0.0000	725	0.0006	462	0.0158	374	0.0002	837	0.0004	706
204	cloudwalk-mt-007	0.0000	591	0.0006	457	0.0158	375	0.0002	833	0.0004	716
205	clova-000	0.0000	1006	0.0022	960	-	1235	0.0006	1098	0.0005	789
206	cmcuni-001	0.0000	455	0.0005	424	0.0119	299	0.0000	246	0.0000	90
207	codeline-000	0.0000	26	0.0000	57	0.0000	109	0.0000	34	0.0000	136
208	cogent-000	-	1302	-	1335	-	1005	-	1336	0.0005	834
209	cogent-001	-	1219	-	1257	-	1253	-	1279	0.0004	761
210	cogent-002	-	1226	-	1260	-	1219	0.0002	777	0.0004	760
211	cogent-003	0.0000	962	0.0018	913	-	1166	0.0001	619	0.0004	618
212	cogent-004	0.0000	404	0.0000	137	-	888	0.0000	206	0.0000	57
213	cogent-005	0.0000	368	0.0000	121	-	864	0.0000	232	0.0000	79
214	cogent-006	0.0000	156	0.0000	18	0.0000	76	0.0000	94	0.0000	189
215	cogent-007	0.0000	957	0.0000	234	0.0000	138	0.0000	466	0.0000	247
216	cogent-008	0.0000	211	0.0010	756	0.0304	637	0.0000	521	0.0004	443
217	cognitec-000	0.0005	1157	0.0112	1149	-	1153	0.0007	1116	0.0007	922
218	cognitec-001	0.0003	1153	0.0110	1148	-	907	0.0008	1134	0.0010	944
219	cognitec-002	0.0001	1099	0.0069	1119	-	1040	0.0003	965	0.0005	800
220	cognitec-003	0.0001	1100	0.0194	1162	0.0820	808	0.0003	956	0.0005	813
221	cognitec-004	0.0001	1101	0.0037	1053	0.0580	759	0.0003	957	0.0005	814
222	cognitec-005	0.0000	1024	0.0026	977	0.0550	754	0.0002	792	0.0005	794
223	cognitec-006	0.0000	1023	0.0016	886	0.0511	740	0.0002	769	-	1198
224	cognitec-007	0.0000	1092	0.0025	976	0.0736	801	0.0002	813	-	1130
225	compal-000	0.0000	178	0.0000	24	0.0000	88	0.0000	82	-	1314
226	compal-001	0.0000	926	0.0060	1112	0.0320	652	0.0012	1163	-	1169
227	cor-001	0.0000	484	0.0006	472	-	1236	0.0002	890	0.0004	626
228	coretech-000	0.0000	267	0.0000	172	0.0000	44	0.0000	175	0.0000	30
229	coretech-001	0.0000	1073	0.0033	1035	0.0677	783	0.0005	1078	0.0011	974
230	coretech-002	0.0000	145	0.0013	845	0.0301	632	0.0000	329	0.0004	651
231	coretech-003	0.0000	425	0.0012	814	0.0282	615	0.0000	454	-	1233
232	coretech-004	0.0000	391	0.0013	846	0.0301	631	0.0000	340	-	1172

Table 88: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
233	corsight-001	0.0000	730	0.0006	493	-	863	0.0001	751	0.0004	576
234	corsight-002	0.0000	640	0.0005	442	0.0152	360	0.0001	691	0.0004	585
235	corsight-003	0.0000	514	0.0006	495	0.0175	405	0.0001	665	0.0004	614
236	csc-001	0.0000	1052	0.0030	1014	-	1068	0.0002	794	0.0005	787
237	csc-002	0.0015	1179	0.0033	1028	-	1175	0.0006	1105	0.0006	906
238	csc-003	0.0015	1180	0.0033	1029	0.0445	733	0.0006	1104	0.0006	905
239	ctbcbank-000	0.0001	1105	0.0051	1094	-	943	0.0011	1154	0.0019	1021
240	ctbcbank-001	0.0000	1033	0.0036	1051	-	1196	0.0005	1073	0.0010	945
241	ctbcbank-002	0.0000	117	0.0006	445	0.0150	353	0.0000	367	-	1272
242	cu-face-002	0.0000	182	0.0000	21	0.0000	86	0.0000	87	0.0000	183
243	cu-face-003	0.0000	968	0.0009	697	0.0245	568	0.0003	923	0.0004	708
244	cu-face-004	0.0000	839	0.0007	572	0.0179	411	0.0001	713	-	1313
245	cubox-001	0.0000	441	0.0000	152	-	908	0.0000	255	0.0000	98
246	cubox-002	0.0000	880	0.0006	482	0.0159	378	0.0002	891	0.0005	853
247	cubox-003	0.0000	249	0.0010	748	0.0210	492	0.0002	790	0.0004	684
248	cubox-004	0.0000	955	0.0009	696	0.0193	453	0.0003	980	-	1219
249	cubox-005	0.0000	939	0.0009	694	0.0193	454	0.0003	977	-	1320
250	cudocommunication-001	0.0000	430	0.0000	140	0.0000	22	0.0000	264	0.0000	107
251	cuhkee-001	0.0000	626	0.0011	781	-	1186	0.0000	331	0.0004	600
252	cybercore-000	0.0000	797	0.0073	1123	-	946	0.0001	651	0.0005	801
253	cybercore-001	0.0000	995	0.0001	254	0.0014	150	0.0002	784	0.0002	266
254	cybercore-002	0.0000	984	0.0001	253	0.0014	151	0.0002	780	0.0002	268
255	cybercore-003	0.0000	724	0.0003	305	0.0060	182	0.0005	1081	0.0003	324
256	cyberextruder-001	0.0029	1183	0.0293	1174	-	1193	0.0024	1210	0.0029	1048
257	cyberextruder-002	0.0013	1176	0.0840	1204	-	1195	0.0027	1220	0.0028	1044
258	cyberextruder-003	0.0000	985	0.0077	1127	0.0887	813	0.0001	753	0.0006	894
259	cyberextruder-004	0.0000	976	0.0097	1142	0.1025	818	0.0001	727	0.0007	907
260	cyberextruder-005	0.0000	363	0.0000	123	0.0000	11	0.0000	227	-	1188
261	cyberextruder-006	0.0000	283	0.0000	181	0.0000	38	0.0000	169	-	1115
262	cyberlink-000	-	1248	-	1280	-	1301	0.0006	1102	0.0008	927
263	cyberlink-001	-	1298	-	1246	-	1205	0.0073	1254	0.0005	792
264	cyberlink-002	-	1365	-	1328	-	941	0.0004	987	0.0004	770
265	cyberlink-003	0.0000	210	0.0007	552	-	1167	0.0001	579	0.0004	529
266	cyberlink-004	0.0000	647	0.0010	764	-	966	0.0004	990	0.0003	406
267	cyberlink-005	0.0000	722	0.0009	664	-	1071	0.0003	972	0.0003	407
268	cyberlink-006	0.0000	272	0.0005	392	-	985	0.0000	311	0.0003	353
269	cyberlink-007	0.0000	42	0.0003	274	0.0067	200	0.0000	291	0.0003	363
270	cyberlink-008	0.0000	209	0.0004	362	0.0106	271	0.0000	307	0.0003	369
271	cyberlink-009	0.0000	7	0.0004	364	0.0106	274	0.0000	294	0.0003	365
272	cyberlink-010	0.0000	337	0.0004	370	0.0106	270	0.0000	313	0.0003	357
273	cyberlink-011	0.0000	456	0.0004	369	0.0106	269	0.0000	317	0.0003	359
274	cyberlink-012	0.0000	246	0.0004	363	0.0106	272	0.0000	302	0.0003	367
275	cyberlink-013	0.0000	427	0.0004	368	0.0106	268	0.0000	320	0.0003	360
276	cyberlink-014	0.0000	33	0.0004	365	0.0106	273	0.0000	293	-	1255
277	cyberlink-015	0.0000	124	0.0004	367	0.0106	275	0.0000	297	-	1278
278	dahua-000	-	1305	-	1337	-	1001	-	1334	0.0000	25
279	dahua-001	-	1329	-	1357	-	1046	0.0000	198	0.0000	48
280	dahua-002	-	1306	-	1333	-	995	0.0024	1213	0.0022	1032
281	dahua-003	0.0000	123	0.0019	919	-	1341	0.0002	848	0.0003	312
282	dahua-004	0.0000	334	0.0009	701	-	1043	0.0001	716	0.0003	287
283	dahua-005	0.0000	49	0.0000	227	-	1284	0.0000	467	0.0003	364
284	dahua-006	0.0000	130	0.0000	229	-	1336	0.0000	518	0.0003	414
285	dahua-007	0.0000	466	0.0000	231	0.0000	139	0.0000	527	0.0003	409
286	daon-000	0.0000	1041	0.0028	1000	0.0577	758	0.0014	1175	0.0015	1010
287	daon-001	0.0000	204	0.0009	645	0.0206	476	0.0000	446	-	1366
288	daon-002	0.0000	341	0.0004	382	0.0094	252	0.0000	186	-	1133
289	datech-000	0.0000	686	0.0004	327	0.0089	247	0.0000	473	0.0003	295
290	datech-001	0.0000	524	0.0004	326	0.0089	248	0.0000	468	-	1289

Table 89: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
291	datech-002	0.0000	517	0.0004	325	0.0089	249	0.0000	469	-	1299
292	decatur-000	0.0000	875	0.0020	936	-	1066	0.0004	1027	0.0005	777
293	decatur-001	0.0000	715	0.0009	690	0.0194	455	0.0001	624	0.0004	558
294	decloakface-001	0.0000	476	0.0016	884	0.0392	712	0.0001	670	0.0005	864
295	decloakface-002	0.0000	459	0.0011	772	0.0218	515	0.0001	569	-	1205
296	deepglint-001	0.0000	129	0.0000	111	-	1335	0.0000	43	0.0000	146
297	deepglint-002	0.0000	707	0.0004	371	-	1077	0.0002	862	0.0004	535
298	deepglint-003	0.0000	525	0.0004	366	-	1306	0.0002	861	0.0004	547
299	deepglint-004	0.0000	731	0.0005	395	0.0130	311	0.0002	885	0.0004	514
300	deepglint-005	0.0000	933	0.0019	922	0.0438	732	0.0006	1096	0.0006	903
301	deepsea-001	0.0000	229	0.0000	46	-	1209	0.0000	125	0.0000	213
302	deepsense-000	0.0000	20	0.0006	497	-	1246	0.0000	379	0.0004	426
303	deepsense-001	0.0000	199	0.0006	503	0.0191	444	0.0000	402	0.0004	439
304	deepsense-002	0.0000	399	0.0006	505	0.0191	443	0.0000	413	0.0004	433
305	deepsense-003	0.0000	167	0.0004	352	0.0110	282	0.0000	328	0.0003	328
306	deepsense-004	0.0000	685	0.0007	540	0.0179	412	0.0001	637	-	1159
307	deepsense-005	0.0000	299	0.0005	441	0.0144	341	0.0001	602	-	1107
308	deepsense-006	0.0000	318	0.0005	396	0.0113	289	0.0000	412	-	1154
309	deepsense-007	0.0000	118	0.0005	394	0.0113	291	0.0000	399	-	1271
310	deepsense-008	0.0000	163	0.0005	393	0.0113	290	0.0000	403	-	1331
311	dermalog-001	-	1363	-	1325	-	956	-	1365	0.0013	998
312	dermalog-002	-	1332	-	1365	-	1088	-	1341	0.0013	997
313	dermalog-003	-	1229	-	1264	-	1291	-	1273	0.0025	1038
314	dermalog-004	-	1237	-	1277	-	1329	-	1296	0.0090	1075
315	dermalog-005	-	1357	0.0031	1018	-	920	0.0013	1172	0.0041	1062
316	dermalog-006	0.0005	1159	0.0031	1022	-	919	0.0013	1170	0.0041	1063
317	dermalog-007	0.0000	677	0.0006	456	-	1060	0.0000	507	0.0002	274
318	dermalog-008	0.0000	1015	0.0031	1021	-	1210	0.0006	1087	0.0003	301
319	dermalog-009	0.0000	1014	0.0031	1019	0.0148	348	0.0006	1086	0.0003	300
320	dermalog-010	0.0000	1016	0.0031	1020	0.0148	347	0.0006	1088	0.0003	302
321	dermalog-011	0.0000	1066	0.0005	398	0.0116	295	0.0001	582	0.0003	314
322	dermalog-012	0.0000	709	0.0003	315	0.0068	204	0.0003	927	0.0005	868
323	dermalog-013	0.0000	497	0.0002	271	0.0051	170	0.0002	776	-	1250
324	dermalog-014	0.0000	515	0.0003	313	0.0068	205	0.0003	926	-	1301
325	dermalog-015	0.0000	763	0.0003	314	0.0068	203	0.0003	928	-	1222
326	dicio-001	0.0005	1165	0.0649	1194	0.2136	838	0.0024	1209	0.0012	984
327	dicio-002	0.0000	181	0.0007	531	0.0185	428	0.0000	382	-	1324
328	didiglobalface-001	0.0000	516	0.0012	789	-	1315	0.0000	546	0.0004	700
329	didiglobalface-002	0.0000	689	0.0012	792	0.0247	573	0.0000	550	0.0004	689
330	didiglobalface-003	0.0000	801	0.0012	794	0.0247	574	0.0000	551	-	1193
331	digidata-000	0.0000	589	0.0023	964	0.0375	704	0.0004	1036	0.0006	889
332	digidata-001	0.0000	752	0.0023	966	0.0375	702	0.0004	1037	0.0006	887
333	digitalbarriers-000	-	1288	-	1243	-	1180	-	1321	0.0019	1022
334	digitalbarriers-001	-	1352	-	1308	-	881	-	1355	0.0018	1019
335	digitalbarriers-002	0.0001	1128	0.0045	1078	-	1221	0.0028	1222	0.0027	1041
336	dps-000	0.0000	338	0.0000	213	0.0000	53	0.0000	196	0.0000	46
337	dsk-000	0.0000	96	0.0000	95	-	1303	0.0000	63	0.0000	159
338	einetworks-000	0.0000	1032	0.0017	899	-	1359	0.0002	842	0.0005	840
339	einetworksindia-000	0.0000	1005	0.0018	911	0.0516	742	0.0002	909	0.0005	845
340	einetworksindia-001	0.0000	1000	0.0018	910	0.0516	744	0.0002	906	0.0005	846
341	einetworksindia-002	0.0000	646	0.0006	460	0.0159	380	0.0000	554	-	1109
342	ekin-002	0.0000	215	0.0000	236	0.0004	146	0.0000	306	0.0000	240
343	element-000	0.0000	612	0.0008	630	0.0192	451	0.0000	458	0.0003	375
344	enface-000	0.0000	361	0.0012	811	0.0305	639	0.0000	495	0.0004	606
345	enface-001	0.0000	135	0.0012	809	0.0304	638	0.0000	423	0.0004	598
346	enface-002	0.0000	569	0.0004	338	0.0084	241	0.0000	369	0.0004	440
347	enqura-001	0.0003	1148	0.0203	1165	0.1737	831	0.0023	1206	-	1145
348	eocortex-000	0.0095	1199	0.0602	1192	-	1266	0.0094	1256	0.0059	1070

Table 90: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
349	ercacat-001	0.0000	417	0.0005	426	-	930	0.0000	497	0.0003	373
350	euronovate-001	0.0255	1212	0.0102	1145	0.0517	745	0.0021	1200	0.0004	763
351	euronovate-002	0.0000	503	0.0010	713	0.0265	604	0.0000	392	0.0004	693
352	euronovate-003	0.0000	682	0.0006	467	0.0159	377	0.0002	840	0.0004	690
353	euronovate-004	0.0000	1008	0.0016	879	0.0236	554	0.0015	1181	0.0006	891
354	everai-000	-	1295	-	1248	-	1218	-	1318	0.0004	473
355	everai-001	-	1362	-	1326	-	955	0.0004	1015	0.0004	759
356	everai-002	-	1366	-	1330	-	937	0.0002	852	0.0004	458
357	everai-paravision-003	0.0000	888	0.0008	632	-	879	0.0002	787	0.0004	511
358	expasoft-000	0.0000	255	0.0000	180	-	1008	0.0000	172	0.0000	28
359	expasoft-001	0.0000	5	0.0000	64	-	1262	0.0000	33	0.0000	132
360	expasoft-002	0.0000	136	0.0000	9	0.0000	79	0.0000	102	0.0000	199
361	f8-001	0.0003	1150	0.0059	1108	-	1239	0.0035	1230	0.0030	1050
362	f8-002	0.0000	1083	0.0150	1157	0.0685	787	0.0005	1041	0.0013	1002
363	facehawk-000	0.0000	958	0.0357	1182	0.0720	798	0.0021	1201	0.0009	938
364	facelocate-001	0.0000	40	0.0019	925	0.0329	663	0.0000	509	-	1246
365	faceonlive-001	0.0000	1057	0.0029	1006	0.0481	737	0.0013	1173	0.0011	960
366	faceonlive-002	0.0002	1144	0.0009	692	0.0075	217	0.0008	1129	0.0008	935
367	faceonlive-003	0.0000	904	0.0202	1164	0.0980	816	0.0005	1059	-	1275
368	facephi-000	0.0000	303	0.0004	328	0.0090	250	0.0001	690	0.0004	446
369	facephi-001	0.0000	867	0.0034	1040	0.0499	739	0.0003	942	-	1099
370	facephi-002	0.0000	756	0.0016	882	0.0286	621	0.0002	859	-	1167
371	facesoft-000	0.0000	222	0.0000	38	-	1154	0.0000	134	0.0000	225
372	facetag-000	0.0000	350	0.0000	217	0.0000	64	0.0000	190	0.0000	41
373	facetag-001	0.0000	343	0.0000	223	0.0000	67	0.0000	187	0.0000	39
374	facetag-002	0.0000	452	0.0000	164	0.0000	36	0.0000	241	0.0000	86
375	facex-001	0.0001	1138	0.0360	1184	-	936	0.0047	1243	0.0027	1043
376	facex-002	0.0001	1137	0.0360	1183	0.2663	842	0.0047	1242	0.0027	1042
377	facia-001	0.0000	402	0.0005	391	0.0122	302	0.0001	562	0.0004	481
378	facia-002	0.0000	931	0.0017	897	0.0185	427	0.0002	900	-	1204
379	faicetech-000	0.0000	691	0.0007	543	0.0130	314	0.0002	899	-	1142
380	farfaces-001	0.0000	1027	0.0007	542	0.0061	184	0.0003	947	0.0003	334
381	fastenterprises-000	0.0000	674	0.0082	1135	0.0169	397	0.0001	749	0.0003	358
382	fci-000	0.0000	457	0.0000	160	0.0000	33	0.0000	248	-	1211
383	fdu-000	-	1282	-	1239	-	1134	-	1303	0.0011	977
384	fdu-001	-	1251	-	1291	-	1367	-	1288	0.0009	943
385	fedu-001	0.0000	165	0.0000	14	0.0000	69	0.0000	98	-	1332
386	fiberhome-nanjing-002	0.0000	856	0.0006	499	-	1198	0.0001	642	0.0004	527
387	fiberhome-nanjing-003	0.0000	107	0.0004	347	-	1362	0.0000	55	0.0003	303
388	fiberhome-nanjing-004	0.0000	236	0.0004	346	-	1202	0.0000	129	0.0003	305
389	fincore-000	0.0000	767	0.0008	628	0.0185	430	0.0001	570	0.0004	680
390	firstcreditkz-001	0.0000	900	0.0019	931	0.0321	655	0.0000	539	0.0004	595
391	firstcreditkz-002	0.0000	522	0.0010	758	0.0232	551	0.0000	489	0.0004	521
392	firstcreditkz-003	0.0000	1037	0.0010	749	0.0219	516	0.0000	479	-	1344
393	firstcreditkz-004	0.0000	478	0.0004	358	0.0124	304	0.0000	295	-	1263
394	foomobi-001	0.0007	1168	0.0000	189	0.0000	40	0.0020	1197	0.0011	962
395	foomobi-002	0.0007	1169	0.0000	130	0.0000	3	0.0020	1199	0.0011	964
396	fourthlinecom-001	0.0000	863	0.0004	356	0.0078	222	0.0005	1054	-	1104
397	fpt-000	0.0001	1108	0.0007	549	0.0076	218	0.0006	1107	-	1168
398	fpt-001	0.0001	1110	0.0005	432	0.0067	201	0.0006	1091	-	1135
399	fraudcom-000	0.0000	829	0.0055	1103	0.0308	643	0.0002	854	0.0004	683
400	frpkauai-001	0.0000	927	0.0024	974	0.0360	691	0.0001	598	0.0004	727
401	frpkauai-002	0.0000	920	0.0019	932	0.0321	653	0.0000	545	0.0004	586
402	frpkauai-003	0.0000	482	0.0006	476	0.0145	344	0.0000	440	-	1260
403	frpkauai-004	0.0001	1127	0.0051	1092	0.0730	800	0.0011	1155	-	1285
404	fujitsulab-000	0.0000	1071	0.0033	1030	-	1213	0.0005	1058	0.0002	263
405	fujitsulab-001	0.0000	59	0.0014	855	-	1273	0.0002	867	0.0003	398
406	fujitsulab-002	0.0000	73	0.0009	656	-	1333	0.0001	712	0.0003	304

Table 91: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
407	fujitsulab-003	0.0000	307	0.0008	601	0.0166	391	0.0001	682	0.0001	257
408	g42-intellibrain-001	0.0000	473	0.0000	166	0.0000	28	0.0000	238	0.0000	82
409	g42-intellibrain-002	0.0000	170	0.0000	12	0.0000	71	0.0000	99	0.0000	193
410	geo-000	0.0000	438	0.0000	155	-	912	0.0000	250	0.0000	94
411	geo-001	0.0000	632	0.0011	770	-	1004	0.0000	543	0.0004	584
412	geo-002	0.0000	586	0.0015	866	0.0332	669	0.0001	559	0.0004	737
413	geo-003	0.0000	574	0.0010	723	0.0244	565	0.0000	350	0.0004	730
414	geo-004	0.0000	670	0.0005	439	0.0138	327	0.0001	655	0.0004	531
415	gistouch-000	0.0000	1082	0.0188	1160	0.1345	823	0.0018	1192	0.0007	908
416	gistouch-001	0.0000	264	0.0002	257	0.0027	158	0.0001	646	0.0003	313
417	glory-000	-	1239	-	1275	-	1322	0.0053	1248	0.0013	1000
418	glory-001	0.0160	1204	0.0314	1178	-	1233	0.0051	1247	0.0010	949
419	glory-002	0.0003	1149	0.0045	1077	-	1326	0.0015	1182	0.0011	976
420	glory-003	0.0000	919	0.0027	990	-	1015	0.0004	998	0.0005	793
421	glory-004	0.0000	813	0.0020	941	0.0345	685	0.0001	693	0.0004	728
422	glory-005	0.0000	873	0.0020	943	0.0345	684	0.0001	704	0.0004	721
423	glory-006	0.0000	865	0.0020	942	0.0345	683	0.0001	700	0.0004	719
424	glory-007	0.0000	910	0.0020	949	0.0403	723	0.0002	864	0.0005	784
425	gorilla-000	-	1224	-	1262	-	1232	-	1277	0.0004	771
426	gorilla-001	-	1225	-	1261	-	1230	0.0003	973	0.0004	772
427	gorilla-002	-	1273	-	1218	-	1091	0.0003	978	0.0004	775
428	gorilla-003	-	1333	-	1366	-	1086	0.0003	979	0.0004	767
429	gorilla-004	0.0000	152	0.0008	611	-	1102	0.0000	422	0.0003	343
430	gorilla-005	0.0000	24	0.0008	619	-	1244	0.0000	418	0.0003	342
431	gorilla-006	0.0000	403	0.0006	511	-	886	0.0000	389	0.0003	336
432	gorilla-007	0.0000	505	0.0009	706	0.0252	587	0.0001	622	0.0004	670
433	gorilla-008	0.0000	784	0.0009	707	0.0259	597	0.0001	627	0.0004	679
434	gorilla-009	0.0000	598	0.0010	735	0.0276	614	0.0001	589	0.0004	657
435	gpstechvn-000	0.0000	138	0.0000	8	0.0000	80	0.0000	103	0.0000	198
436	graymatics-001	0.0000	392	0.0010	711	0.0210	488	0.0001	750	0.0004	560
437	griaule-000	0.0000	1050	0.0026	988	0.0531	751	0.0004	1039	0.0010	946
438	griaule-001	0.0000	380	0.0012	812	0.0366	696	0.0000	390	0.0004	660
439	griaule-002	0.0000	282	0.0007	553	0.0209	480	0.0000	535	0.0004	573
440	gtelots-000	0.0000	914	0.0003	320	0.0081	235	0.0004	995	-	1352
441	hertasecurity-000	0.0133	1203	0.0077	1128	-	894	0.0025	1216	0.0243	1082
442	hertasecurity-001	0.0000	323	0.0000	239	0.0000	141	0.0000	359	0.0001	248
443	hertasecurity-002	0.0000	329	0.0000	207	0.0000	56	0.0000	357	0.0000	233
444	hertasecurity-003	0.0000	450	0.0000	162	0.0000	37	0.0000	315	0.0000	235
445	hik-001	0.0000	383	0.0000	242	-	850	0.0000	219	0.0000	71
446	hisign-001	0.0000	221	0.0000	36	0.0000	90	0.0000	138	0.0000	222
447	hisign-002	0.0000	849	0.0006	484	0.0150	354	0.0001	709	0.0003	404
448	hisign-003	0.0000	812	0.0008	627	0.0237	556	0.0001	708	-	1253
449	hyperverge-001	0.0000	1079	0.0072	1120	-	983	0.0015	1184	0.0014	1005
450	hyperverge-002	0.0000	345	0.0008	598	0.0210	493	0.0002	898	0.0004	559
451	hyperverge-003	0.0000	36	0.0008	593	0.0210	489	0.0002	894	0.0004	566
452	hyperverge-004	0.0000	568	0.0008	624	0.0218	512	0.0002	851	0.0004	597
453	hyperverge-005	0.0000	106	0.0008	594	0.0210	491	0.0002	896	0.0004	570
454	hyperverge-006	0.0000	16	0.0008	592	0.0210	490	0.0002	895	-	1266
455	hyundai-roboticslab-000	0.0000	44	0.0011	783	0.0246	570	0.0001	679	-	1249
456	hyundai-roboticslab-001	0.0000	247	0.0105	1147	0.1972	832	0.0007	1119	-	1347
457	hyundai-roboticslab-002	0.0000	454	0.0020	948	0.0299	630	0.0002	880	-	1209
458	hyundai-roboticslab-003	0.0000	189	0.0005	397	0.0136	323	0.0000	327	-	1309
459	hzailu-001	0.0000	998	0.0016	883	0.0449	734	0.0003	967	0.0005	850
460	hzailu-002	0.0000	999	0.0015	873	0.0424	725	0.0003	966	0.0005	849
461	hzailu-003	0.0000	581	0.0004	329	0.0081	232	0.0002	782	0.0003	386
462	hzailu-004	0.0000	774	0.0004	333	0.0081	229	0.0002	786	0.0003	381
463	hzailu-005	0.0000	793	0.0004	334	0.0081	230	0.0002	785	0.0003	379
464	hzailu-006	0.0000	614	0.0004	331	0.0081	233	0.0002	783	0.0003	389

Table 92: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
465	hzailu-007	0.0000	822	0.0004	332	0.0081	234	0.0003	933	-	1287
466	hzailu-008	0.0000	848	0.0004	330	0.0081	231	0.0003	934	-	1306
467	i2v-001	0.0000	1004	0.0018	916	0.0341	681	0.0001	645	-	1108
468	i2v-002	0.0000	905	0.0012	787	0.0244	566	0.0000	487	-	1333
469	icm-002	0.0000	169	0.0001	247	-	1094	0.0000	100	0.0000	231
470	icm-003	0.0000	150	0.0001	246	0.0023	153	0.0000	107	0.0000	232
471	icm-004	0.0000	1044	0.0033	1039	0.0698	790	0.0006	1103	0.0010	957
472	icm-005	0.0002	1143	0.0117	1152	0.1223	821	0.0018	1195	0.0014	1009
473	icomm-000	0.0000	720	0.0004	351	0.0098	259	0.0000	516	0.0003	335
474	icthtc-000	0.0001	1135	0.0047	1085	-	910	0.0028	1224	0.0029	1045
475	id3-001	-	1317	-	1344	-	965	-	1332	0.0043	1066
476	id3-002	-	1279	-	1229	-	1144	-	1310	0.0032	1052
477	id3-003	0.0001	1102	0.0052	1097	-	1124	0.0016	1187	0.0011	975
478	id3-004	0.0000	1094	0.0052	1095	-	1034	0.0015	1185	0.0011	973
479	id3-005	0.0000	571	0.0074	1125	-	1090	0.0002	803	0.0005	795
480	id3-006	0.0000	917	0.0009	700	-	1182	0.0004	1012	0.0005	836
481	id3-007	0.0000	489	0.0041	1064	-	1227	0.0001	683	0.0004	627
482	id3-008	0.0000	216	0.0006	491	0.0184	424	0.0001	744	0.0004	444
483	idemia-003	-	1252	-	1293	-	1366	0.0000	400	0.0004	467
484	idemia-004	0.0000	649	0.0006	474	-	969	0.0000	449	0.0004	477
485	idemia-005	0.0000	289	0.0004	379	-	1033	0.0000	353	0.0003	376
486	idemia-006	0.0000	67	0.0004	373	-	1269	0.0000	345	0.0003	382
487	idemia-007	0.0000	164	0.0004	372	-	1093	0.0000	352	0.0003	387
488	idemia-008	0.0000	127	0.0004	375	0.0078	225	0.0000	347	0.0003	384
489	idemia-009	0.0000	436	0.0004	359	0.0077	220	0.0000	362	0.0003	380
490	idemia-010	0.0000	468	0.0004	324	0.0074	213	0.0000	234	0.0003	339
491	idemia-011	0.0000	242	0.0003	277	0.0055	175	0.0000	114	-	1340
492	identy-000	0.0000	1084	0.0020	945	0.0152	357	0.0012	1161	0.0004	724
493	identy-001	0.0000	1088	0.0013	841	0.0398	718	0.0002	887	-	1329
494	identy-002	0.0000	1090	0.0013	840	0.0401	719	0.0002	884	-	1338
495	idrnd-000	0.0000	827	0.0020	935	0.0566	756	0.0003	975	-	1280
496	idrnd-001	0.0000	63	0.0006	477	0.0182	416	0.0000	377	-	1242
497	igearx-face-000	0.0000	762	0.0006	452	0.0153	362	0.0004	1008	0.0004	662
498	iit-000	-	1341	-	1302	-	866	0.0007	1110	0.0011	966
499	iit-001	0.0000	921	0.0806	1203	-	1049	0.0001	762	0.0004	643
500	iit-002	0.0000	1040	0.0021	950	-	1206	0.0009	1142	0.0005	861
501	iit-003	0.0000	616	0.0008	626	-	1197	0.0000	457	0.0004	472
502	imds-software-001	0.0000	159	0.0000	15	0.0000	74	0.0000	91	0.0000	184
503	imds-software-002	0.0000	154	0.0000	19	0.0000	75	0.0000	95	0.0000	190
504	imds-software-003	0.0000	64	0.0000	82	0.0000	114	0.0000	12	0.0000	118
505	imperial-000	0.0000	302	0.0000	202	-	1019	0.0000	146	0.0000	1
506	imperial-001	-	1234	-	1268	-	1275	0.0000	1	0.0000	112
507	imperial-002	0.0000	191	0.0000	28	-	1132	0.0000	76	0.0000	171
508	incode-000	-	1293	-	1244	-	1155	-	1320	0.0035	1055
509	incode-001	-	1359	-	1320	-	906	-	1367	0.0035	1054
510	incode-002	-	1354	-	1319	-	926	0.0004	1034	0.0007	910
511	incode-003	-	1312	-	1345	-	976	0.0004	1032	0.0007	909
512	incode-004	-	1257	-	1287	-	1355	0.0004	1030	0.0007	911
513	incode-005	0.0000	84	0.0008	591	-	1313	0.0001	632	0.0004	649
514	incode-006	0.0000	680	0.0005	409	-	1056	0.0001	728	0.0004	419
515	incode-007	0.0000	894	0.0009	673	-	947	0.0002	819	0.0004	543
516	incode-008	0.0000	862	0.0009	674	-	990	0.0002	812	0.0004	532
517	incode-009	0.0000	837	0.0009	670	0.0255	595	0.0002	808	0.0004	548
518	incode-010	0.0000	833	0.0009	669	0.0255	594	0.0002	809	0.0004	551
519	incode-011	0.0000	879	0.0009	671	0.0255	593	0.0002	817	0.0004	541
520	incode-012	0.0000	882	0.0009	672	0.0255	592	0.0002	816	0.0004	539
521	incode-013	0.0001	1140	0.0012	804	0.0254	590	0.0005	1067	0.0004	747
522	incode-014	0.0000	51	0.0006	501	0.0166	390	0.0001	755	-	1238

Table 93: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
523	incode-015	0.0000	25	0.0007	569	0.0195	457	0.0000	395	-	1262
524	infocert-001	0.0000	943	0.0059	1111	0.0424	726	0.0001	635	0.0006	879
525	innefulabs-000	0.0000	532	0.0024	972	-	1364	0.0003	946	0.0005	830
526	innominds-001	0.0000	991	0.0030	1013	0.0637	772	0.0010	1152	0.0008	932
527	innov8tif-000	0.0000	1034	0.0029	1010	0.0657	776	0.0004	1025	-	1183
528	innovativetechnologyltd-001	0.0001	1132	0.0050	1091	-	1027	0.0024	1215	0.0025	1037
529	innovativetechnologyltd-002	0.0000	916	0.0046	1079	-	1188	0.0057	1250	0.0005	833
530	innovatrics-000	-	1309	-	1348	-	981	-	1329	0.0004	733
531	innovatrics-001	-	1246	-	1283	-	1309	-	1293	0.0004	736
532	innovatrics-002	-	1353	-	1309	-	878	-	1354	0.0004	455
533	innovatrics-003	-	1221	-	1256	-	1237	-	1283	0.0005	780
534	innovatrics-004	0.0000	855	0.0017	898	-	1211	0.0000	541	0.0004	685
535	innovatrics-005	-	1258	-	1297	-	1350	0.0000	537	0.0004	666
536	innovatrics-006	0.0000	701	0.0009	698	-	1083	0.0000	484	0.0004	451
537	innovatrics-007	0.0000	759	0.0007	563	-	929	0.0001	564	0.0003	340
538	innovatrics-008	0.0000	663	0.0009	688	0.0204	468	0.0000	488	0.0004	417
539	innovatrics-009	0.0000	3	0.0005	388	0.0142	336	0.0000	30	0.0000	239
540	innovatrics-010	0.0000	760	0.0019	924	0.0393	713	0.0001	628	0.0004	436
541	innovatrics-011	0.0000	558	0.0001	248	0.0017	152	0.0000	301	-	1334
542	innovatrics-012	0.0000	702	0.0004	386	0.0118	296	0.0000	472	-	1139
543	innovatrics-013	0.0000	609	0.0001	251	0.0027	157	0.0000	280	-	1354
544	innovatrics-014	0.0000	502	0.0007	532	0.0165	387	0.0000	393	-	1236
545	innovatrics-015	0.0000	575	0.0008	617	0.0236	555	0.0000	381	-	1317
546	innovatrics-016	0.0000	746	0.0006	451	0.0177	408	0.0000	289	-	1163
547	insightface-000	0.0000	333	0.0000	215	0.0000	54	0.0000	197	0.0000	49
548	insightface-001	0.0000	38	0.0000	69	0.0000	105	0.0000	21	0.0000	125
549	insightface-002	0.0000	462	0.0000	170	0.0000	30	0.0000	236	0.0000	81
550	insightface-003	0.0000	74	0.0000	92	0.0000	127	0.0000	68	0.0000	165
551	insightface-004	0.0000	185	0.0000	20	0.0000	85	0.0000	86	0.0000	181
552	inspur-000	0.0000	372	0.0000	118	0.0000	9	0.0000	230	0.0000	76
553	inspur-001	0.0000	146	0.0000	2	0.0000	77	0.0000	110	0.0000	202
554	inspur-002	0.0000	157	0.0000	17	0.0000	72	0.0000	90	0.0000	186
555	inspur-003	0.0000	76	0.0000	90	0.0000	128	0.0000	69	-	1295
556	intellicloudai-001	0.0000	235	0.0000	41	-	1201	0.0000	128	0.0000	218
557	intellicloudai-002	0.0000	467	0.0008	610	-	942	0.0000	462	0.0004	434
558	intellifusion-001	0.0000	698	0.0005	433	-	1085	0.0001	610	0.0003	394
559	intellifusion-002	0.0000	339	0.0000	238	-	1087	0.0000	284	0.0000	38
560	intellivision-001	0.0042	1187	0.0296	1175	-	952	0.0048	1244	0.0042	1064
561	intellivision-002	0.0000	1087	0.0046	1080	-	957	0.0012	1162	0.0005	869
562	intellivision-003	0.0000	678	0.0012	800	0.0308	641	0.0003	935	0.0004	768
563	intellivision-004	0.0000	755	0.0011	773	0.0266	608	0.0002	905	0.0004	757
564	intellivision-005	0.0001	1124	0.0041	1065	0.0528	748	0.0005	1062	0.0007	920
565	intellivision-006	0.0001	1123	0.0041	1067	0.0528	750	0.0005	1061	0.0007	919
566	intellivision-007	0.0001	1126	0.0041	1068	0.0528	747	0.0005	1064	0.0007	918
567	intellivix-001	0.0000	32	0.0000	72	0.0000	107	0.0000	24	0.0000	128
568	intellivix-002	0.0000	111	0.0009	693	0.0184	425	0.0000	51	0.0000	151
569	intellivix-003	0.0000	275	0.0000	185	0.0000	39	0.0000	163	0.0000	20
570	intellivix-004	0.0000	375	0.0022	956	0.0333	672	0.0000	216	0.0000	68
571	intellivix-005	0.0000	342	0.0022	957	0.0333	673	0.0000	188	0.0000	40
572	intellivix-006	0.0000	254	0.0007	535	0.0180	413	0.0000	173	-	1117
573	intelresearch-000	0.0000	599	0.0006	444	-	1173	0.0000	514	0.0003	405
574	intelresearch-001	0.0000	1062	0.0082	1134	-	1283	0.0005	1070	0.0010	947
575	intelresearch-002	0.0000	496	0.0022	954	-	1287	0.0000	510	0.0004	425
576	intelresearch-003	0.0000	554	0.0006	464	-	1121	0.0000	404	0.0004	524
577	intelresearch-004	0.0000	547	0.0006	468	-	1342	0.0000	396	0.0004	520
578	intelresearch-005	0.0000	693	0.0006	469	0.0144	343	0.0000	410	0.0004	508
579	intelresearch-006	0.0000	423	0.0000	235	0.0004	147	0.0000	318	0.0004	516
580	intelresearch-007	0.0000	233	0.0007	519	0.0168	394	0.0000	304	0.0004	528

Table 94: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
581	intelresearch-008	0.0000	445	0.0006	512	0.0169	398	0.0000	316	0.0004	542
582	intelresearch-009	0.0000	273	0.0007	573	0.0232	549	0.0000	310	-	1112
583	intelresearch-010	0.0000	761	0.0010	757	0.0335	675	0.0000	475	-	1225
584	intelresearch-011	0.0000	655	0.0006	507	0.0175	404	0.0000	448	-	1103
585	intelresearch-012	0.0000	659	0.0007	541	0.0191	449	0.0000	447	-	1100
586	intema-000	0.0000	355	0.0005	407	0.0126	306	0.0000	524	0.0004	449
587	intema-001	0.0000	548	0.0004	357	0.0106	276	0.0000	296	0.0003	413
588	interlinklabs-001	0.0000	1047	0.0004	376	0.0085	242	0.0005	1052	-	1177
589	interlinklabs-002	0.0000	1046	0.0004	377	0.0085	243	0.0005	1053	-	1180
590	interlinklabs-003	0.0000	866	0.0031	1025	0.0249	577	0.0003	950	-	1098
591	intozi-001	0.0000	638	0.0005	438	0.0126	305	0.0001	766	0.0004	418
592	intsysmsu-000	-	1316	-	1342	-	968	0.0004	1007	0.0012	979
593	intsysmsu-001	0.0000	395	0.0010	740	-	895	0.0001	661	0.0004	622
594	intsysmsu-002	0.0000	197	0.0010	737	-	1127	0.0001	659	0.0004	629
595	ionetworks-000	0.0000	47	0.0016	889	0.0387	710	0.0004	981	0.0005	798
596	ionetworks-001	0.0000	253	0.0081	1131	0.0666	777	0.0000	119	0.0000	209
597	ionetworks-002	0.0000	144	0.0003	288	0.0048	167	0.0000	111	0.0000	205
598	ionetworks-003	0.0000	461	0.0004	339	0.0079	227	0.0000	235	-	1195
599	iqface-000	0.0000	261	0.0000	175	-	991	0.0000	179	0.0000	33
600	iqface-001	0.0000	18	0.0000	60	-	1245	0.0000	271	0.0000	140
601	iqface-003	0.0000	1036	0.0076	1126	-	1181	0.0006	1089	0.0005	867
602	iqsec-001	0.0000	89	0.0763	1202	0.1617	828	0.0000	56	-	1290
603	iqsec-002	0.0000	12	0.0763	1201	0.1617	827	0.0000	25	-	1257
604	irex-000	0.0000	937	0.0009	691	-	1114	0.0000	513	0.0005	785
605	isap-001	0.0000	279	0.0000	186	-	972	0.0000	162	0.0000	21
606	isap-002	0.0000	196	0.0000	26	-	1126	0.0000	79	0.0000	175
607	isityou-000	0.0068	1195	0.0316	1179	-	1104	0.0023	1205	0.0010	954
608	isystems-000	-	1324	-	1356	-	1016	-	1326	0.0010	953
609	isystems-001	0.0000	1053	0.0035	1048	-	1276	0.0010	1148	0.0007	916
610	isystems-002	0.0000	1055	0.0035	1047	-	1128	0.0010	1149	0.0007	917
611	itmo-001	-	1245	-	1284	-	1308	-	1292	0.0047	1067
612	itmo-002	-	1368	-	1327	-	932	-	1363	0.0029	1049
613	itmo-003	-	1284	-	1237	-	1136	-	1305	0.0008	925
614	itmo-004	-	1349	-	1315	-	889	-	1350	0.0004	756
615	itmo-005	-	1323	-	1354	-	1020	0.0005	1048	0.0002	264
616	itmo-006	0.0000	326	0.0015	872	-	1055	0.0004	1033	0.0004	621
617	itmo-007	0.0000	198	0.0009	650	-	1123	0.0003	971	0.0000	176
618	itmo-008	0.0000	140	0.0135	1154	0.1239	822	0.0024	1214	0.0000	197
619	ivacognitive-001	0.0000	858	0.0011	775	-	1191	0.0001	587	0.0004	738
620	iws-000	0.0005	1163	0.0650	1196	-	1225	0.0024	1211	0.0012	986
621	jaakit-001	0.0008	1173	0.0858	1205	0.2713	843	0.0042	1237	0.0021	1028
622	jaakit-002	0.0000	103	0.0000	109	0.0000	133	0.0000	46	-	1281
623	kakao-001	-	1320	-	1353	-	1039	0.0002	868	0.0005	807
624	kakao-002	0.0000	923	0.0057	1107	-	1075	0.0002	869	0.0005	808
625	kakao-003	0.0000	1	0.0000	66	-	1260	0.0000	31	0.0000	133
626	kakao-004	0.0000	287	0.0000	197	-	1037	0.0000	153	0.0000	12
627	kakao-005	0.0000	90	0.0000	228	-	1307	0.0000	57	0.0000	245
628	kakao-007	0.0000	369	0.0007	515	0.0165	388	0.0001	650	0.0004	513
629	kakao-008	0.0000	137	0.0009	659	0.0209	486	0.0001	644	0.0004	525
630	kakao-009	0.0000	381	0.0009	661	0.0209	485	0.0001	649	0.0004	512
631	kakaobank-000	0.0000	356	0.0000	224	0.0000	60	0.0000	183	0.0000	36
632	kakaobank-001	0.0000	426	0.0006	466	0.0176	406	0.0000	364	0.0004	461
633	kakaobank-002	0.0000	608	0.0010	765	0.0303	636	0.0000	428	-	1355
634	kakaobank-003	0.0000	792	0.0013	844	0.0397	715	0.0000	415	-	1213
635	kakaopay-001	0.0000	892	0.0013	837	0.0322	656	0.0001	608	0.0004	740
636	kasikornlabs-000	0.0000	1069	0.0035	1046	0.0713	796	0.0004	1028	0.0012	992
637	kasikornlabs-001	0.0001	1134	0.0050	1090	0.0885	812	0.0006	1106	0.0035	1057
638	kasikornlabs-002	0.0000	1061	0.0033	1031	0.0698	794	0.0004	1018	0.0012	981

Table 95: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
639	kasikornlabs-003	0.0000	1064	0.0033	1034	0.0698	793	0.0004	1021	0.0012	980
640	kasikornlabs-004	0.0000	1065	0.0033	1032	0.0698	791	0.0004	1023	-	1212
641	kasikornlabs-005	0.0000	1063	0.0033	1033	0.0698	792	0.0004	1022	-	1143
642	kbyai-000	0.0000	694	0.0013	822	0.0265	607	0.0001	580	-	1150
643	kedacom-000	0.0000	444	0.0000	165	-	958	0.0000	244	0.0000	87
644	keyless-000	0.0000	745	0.0010	733	0.0308	642	0.0000	435	-	1164
645	kiwitech-000	0.0000	555	0.0009	644	-	1117	0.0004	1019	0.0005	790
646	kloudspot-001	0.0000	911	0.0010	731	0.0211	494	0.0001	719	-	1361
647	kloudspot-002	0.0000	434	0.0006	508	0.0159	381	0.0002	856	-	1215
648	kneron-003	0.0239	1210	0.0306	1176	-	945	0.0044	1241	0.0016	1017
649	kneron-005	0.0000	1058	0.0226	1167	-	1143	0.0006	1084	0.0005	824
650	knowutech-000	0.0000	717	0.0008	586	0.0215	508	0.0000	480	0.0004	639
651	kogniza-001	0.0000	511	0.0012	816	0.0337	680	0.0003	961	-	1302
652	kookmin-001	0.0000	260	0.0000	176	-	992	0.0000	178	0.0000	32
653	kookmin-002	0.0000	370	0.0000	117	-	862	0.0000	231	0.0000	75
654	koreaid-001	0.0000	446	0.0023	968	0.0371	699	0.0000	531	0.0005	778
655	krungthai-002	0.0000	518	0.0005	418	0.0111	285	0.0002	844	0.0003	415
656	kuke3d-001	0.0000	463	0.0000	169	0.0000	31	0.0000	237	0.0000	80
657	kuke3d-002	0.0000	453	0.0000	157	0.0000	35	0.0000	249	0.0000	88
658	lebentech-000	0.0042	1185	0.0029	1011	0.0252	586	0.0051	1246	0.0066	1072
659	lebentech-001	0.0000	1093	0.0012	815	0.0317	647	0.0004	1029	0.0005	842
660	lemalabs-001	0.0000	292	0.0005	437	0.0141	334	0.0002	835	0.0004	447
661	lightvision-000	0.0000	200	0.0000	35	0.0000	95	0.0000	141	-	1360
662	lightvision-001	0.0000	365	0.0000	122	0.0000	10	0.0000	224	-	1186
663	lineclova-000	0.0000	226	0.0000	49	0.0000	103	0.0000	122	0.0000	216
664	lineclova-001	0.0000	86	0.0000	104	0.0000	123	0.0000	60	0.0000	158
665	lineclova-002	0.0000	313	0.0007	518	0.0181	415	0.0000	201	0.0000	54
666	lineclova-003	0.0000	1010	0.0023	962	0.0700	795	0.0002	903	0.0005	781
667	lookman-002	0.0000	53	0.0000	87	-	1280	0.0000	6	0.0000	113
668	lookman-004	0.0000	71	0.0000	78	-	1267	0.0000	10	0.0000	116
669	luxand-000	0.0000	310	0.0000	199	-	1013	0.0000	151	0.0000	6
670	luxand-001	0.0000	935	0.0016	888	0.0366	695	0.0006	1094	0.0005	838
671	luxand-003	0.0000	946	0.0016	887	0.0366	694	0.0006	1095	-	1342
672	luxand-004	0.0000	729	0.0003	308	0.0061	186	0.0003	915	-	1189
673	mantra-000	0.0001	1103	0.0041	1069	0.0680	786	0.0003	945	0.0004	762
674	matrixcomsec-000	0.0002	1141	1.0000	1318	1.0000	927	0.0336	1267	-	1221
675	matrixcomsec-001	0.0000	205	0.0009	655	0.0252	585	0.0000	142	-	1368
676	maverickresearch-000	0.0000	929	0.0096	1141	0.0574	757	0.0013	1171	-	1214
677	maxvision-000	0.0000	295	0.0000	232	0.0000	49	0.0000	160	0.0000	16
678	maxvision-001	0.0000	385	0.0000	125	0.0000	2	0.0000	220	0.0000	69
679	maxvision-002	0.0000	563	0.0009	639	0.0229	541	0.0002	772	0.0004	599
680	maxvision-003	0.0000	751	0.0009	642	0.0229	540	0.0002	774	0.0004	587
681	maxvision-004	0.0000	538	0.0009	641	0.0229	543	0.0002	779	0.0004	594
682	maxvision-005	0.0000	483	0.0009	640	0.0229	542	0.0002	778	0.0004	591
683	maxvision-006	0.0000	535	0.0007	577	0.0226	527	0.0002	796	0.0004	593
684	mbbankvn-000	0.0000	631	0.0004	350	0.0098	258	0.0000	515	-	1120
685	megvii-000	-	1338	-	1305	-	869	-	1359	0.0003	311
686	megvii-001	0.0000	139	0.0006	470	-	1119	0.0007	1117	0.0004	495
687	megvii-002	0.0000	171	0.0006	471	-	1092	0.0054	1249	0.0004	493
688	megvii-003	0.0000	513	0.0010	759	-	1319	0.0002	883	0.0004	714
689	megvii-004	0.0000	664	0.0010	734	-	1022	0.0002	810	0.0004	636
690	megvii-005	0.0000	639	0.0010	721	0.0206	472	0.0002	876	0.0004	688
691	megvii-006	0.0000	486	0.0010	718	0.0206	474	0.0002	873	0.0004	694
692	megvii-007	0.0000	583	0.0010	714	0.0206	473	0.0002	875	0.0004	701
693	megvii-008	0.0000	523	0.0010	719	0.0206	475	0.0002	874	0.0004	698
694	megvii-009	0.0000	805	0.0010	720	0.0206	471	0.0002	878	0.0004	691
695	meituan-000	0.0000	128	0.0001	252	0.0013	149	0.0000	346	0.0002	275
696	meituan-001	0.0000	542	0.0014	858	0.0295	626	0.0001	664	0.0004	667

Table 96: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
697	meituan-002	0.0000	621	0.0013	832	0.0251	583	0.0001	666	0.0004	653
698	meituan-003	0.0000	635	0.0013	833	0.0251	581	0.0001	669	0.0004	638
699	meituan-004	0.0000	624	0.0013	831	0.0251	582	0.0001	667	0.0004	655
700	meiya-001	0.0000	1048	0.0028	1001	-	1256	0.0004	1035	0.0010	956
701	mendaxiatech-000	0.0000	492	0.0010	717	0.0206	470	0.0002	881	0.0004	695
702	metsakuurcompany-001	0.0000	21	0.0011	767	0.0208	479	0.0002	871	0.0004	519
703	metsakuurcompany-002	0.0000	346	0.0000	221	0.0000	65	0.0000	191	0.0000	44
704	metsakuurcompany-003	0.0000	85	0.0000	102	0.0000	125	0.0000	61	0.0000	157
705	metsakuurcompany-004	0.0000	212	0.0000	40	0.0000	92	0.0000	133	-	1353
706	metsakuurcompany-005	0.0000	379	0.0000	127	0.0000	5	0.0000	215	-	1174
707	miaxis-001	0.0000	529	0.0013	828	0.0262	602	0.0001	746	0.0003	326
708	miaxis-002	0.0448	1215	0.1162	1208	0.2565	841	0.2128	1270	0.0347	1086
709	miaxis-003	0.0000	565	0.0013	827	0.0262	601	0.0001	748	0.0003	327
710	miaxis-004	0.0000	460	0.0000	156	0.0000	32	0.0000	245	-	1207
711	microfocus-000	-	1228	-	1265	-	1295	-	1275	0.0016	1013
712	microfocus-001	0.0001	1131	0.0053	1101	-	1194	0.0008	1131	0.0016	1015
713	microfocus-002	0.0001	1130	0.0053	1100	-	1111	0.0008	1130	0.0016	1014
714	microfocus-003	0.0001	1122	0.0049	1089	0.0819	807	0.0007	1121	0.0015	1012
715	minivision-000	0.0000	120	0.0000	113	-	1344	0.0000	38	0.0000	141
716	mitek-000	0.0000	934	0.0029	1005	0.0521	746	0.0002	838	0.0003	350
717	mitek-001	0.0000	823	0.0020	934	0.0566	755	0.0003	976	-	1294
718	mitek-002	0.0000	19	0.0012	806	0.0373	701	0.0000	499	-	1264
719	mobai-000	0.0000	961	0.0114	1150	-	1147	0.0003	953	0.0012	989
720	mobai-001	0.0000	857	0.0040	1058	-	1190	0.0001	689	0.0012	988
721	mobai-002	0.0000	838	0.0008	588	0.0149	349	0.0002	781	-	1315
722	mobbl-000	0.0116	1202	0.0720	1200	-	1130	0.0119	1260	0.0063	1071
723	mobbl-001	0.0000	1039	0.0052	1096	0.0678	784	0.0002	793	0.0005	844
724	mobbl-002	0.0000	1059	0.0029	1007	0.0633	771	0.0002	858	0.0009	941
725	mobbl-003	0.0000	1060	0.0029	1008	0.0633	770	0.0002	860	0.0009	940
726	mobbl-004	0.0000	234	0.0012	805	0.0312	645	0.0000	426	-	1351
727	mobbl-005	0.0000	738	0.0009	652	0.0217	509	0.0000	414	-	1182
728	mobipintech-000	0.0000	331	0.0000	216	0.0000	55	0.0000	194	0.0000	45
729	momovn-001	0.0015	1177	0.0010	709	0.0103	262	0.0011	1157	0.0008	928
730	momovn-002	0.0015	1178	0.0010	710	0.0103	261	0.0011	1156	-	1307
731	momovn-003	0.0000	824	0.0031	1024	0.0249	578	0.0003	949	-	1283
732	moredian-000	0.0000	610	0.0009	646	-	1212	0.0004	1020	0.0005	791
733	morpho-000	-	1346	-	1314	-	890	-	1351	0.0000	60
734	morpho-001	-	1283	-	1238	-	1135	-	1304	0.0000	174
735	morpho-002	-	1281	-	1227	-	1146	0.0000	502	0.0004	492
736	mukh-001	0.0000	2	0.0010	738	0.0154	369	0.0001	680	0.0003	291
737	mukh-002	0.0000	393	0.0022	961	0.0513	741	0.0002	788	0.0004	575
738	mukh-003	0.0000	611	0.0003	281	0.0060	183	0.0001	764	0.0003	403
739	mukh-004	0.0000	790	0.0013	836	0.0327	659	0.0000	528	0.0004	423
740	mukh-005	0.0000	697	0.0009	704	0.0245	567	0.0000	461	-	1132
741	multimodality-000	0.0000	147	0.0000	1	0.0000	78	0.0000	109	0.0000	201
742	multimodality-001	0.0000	105	0.0009	636	0.0259	598	0.0000	54	0.0000	152
743	mvision-001	0.0000	408	0.0000	134	-	875	0.0000	208	0.0000	62
744	nazhiai-000	0.0000	142	0.0000	5	-	1108	0.0000	112	0.0000	204
745	ncsgroup-000	0.0000	121	0.0000	112	0.0000	129	0.0000	39	-	1268
746	ncssg-001	0.0000	284	0.0000	196	0.0000	51	0.0000	155	0.0000	11
747	ncssg-002	0.0000	353	0.0000	225	0.0000	62	0.0000	182	-	1125
748	ncssg-003	0.0000	475	0.0006	487	0.0149	351	0.0003	924	-	1259
749	ncssg-004	0.0000	656	0.0006	489	0.0149	350	0.0003	925	-	1106
750	neosystems-001	0.0000	420	0.0000	230	-	925	0.0013	1169	0.9994	1093
751	neosystems-002	0.0000	400	0.0000	138	0.0000	15	0.0000	207	0.0000	59
752	neosystems-003	0.0000	206	0.0000	32	0.0000	93	0.0000	143	0.0000	230
753	neosystems-004	0.0000	82	0.0000	89	0.0000	126	0.0000	74	0.0000	169
754	netbridgetech-001	0.0000	22	0.0000	56	-	1243	0.0000	35	0.0000	135

Table 97: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
755	netbridgetech-002	0.0000	13	0.0000	59	-	1247	0.0000	36	0.0000	139
756	neurotechnology-000	-	1340	-	1303	-	872	-	1360	0.0000	72
757	neurotechnology-001	-	1300	-	1251	-	1185	-	1317	0.0000	208
758	neurotechnology-002	-	1330	-	1360	-	1041	-	1347	0.0000	50
759	neurotechnology-003	-	1265	-	1215	-	1107	-	1315	0.0005	796
760	neurotechnology-004	-	1272	-	1220	-	1095	0.0000	383	0.0001	258
761	neurotechnology-005	-	1220	-	1253	-	1242	0.0004	993	0.0004	568
762	neurotechnology-006	0.0000	950	0.0006	485	-	868	0.0004	994	0.0004	561
763	neurotechnology-008	0.0000	930	0.0006	483	-	905	0.0004	992	0.0004	544
764	neurotechnology-009	0.0000	850	0.0008	590	-	1177	0.0002	801	0.0004	498
765	neurotechnology-010	0.0000	495	0.0001	249	-	1288	0.0000	511	0.0002	267
766	neurotechnology-011	0.0000	872	0.0013	819	-	1051	0.0002	797	0.0003	395
767	neurotechnology-012	0.0000	1017	0.0010	766	0.0242	562	0.0001	718	0.0004	632
768	neurotechnology-013	0.0000	290	0.0008	631	0.0185	429	0.0000	334	0.0001	249
769	neurotechnology-015	0.0000	389	0.0004	336	0.0082	236	0.0000	212	0.0000	234
770	neurotechnology-016	0.0000	46	0.0003	293	0.0069	207	0.0000	18	0.0000	236
771	neurotechnology-017	0.0000	81	0.0003	317	0.0065	197	0.0000	72	0.0000	237
772	neurotechnology-018	0.0000	544	0.0003	322	0.0074	214	0.0000	398	0.0004	438
773	neurotechnology-019	0.0000	708	0.0004	355	0.0115	293	0.0000	312	-	1136
774	neurotechnology-020	0.0000	665	0.0004	354	0.0115	294	0.0000	308	-	1095
775	nextmetalabs-001	0.0000	274	0.0000	188	0.0000	41	0.0000	166	-	1111
776	nextmetalabs-002	0.0000	101	0.0000	108	0.0000	134	0.0000	49	-	1279
777	nextmetalabs-003	0.0000	628	0.0006	513	0.0184	426	0.0000	354	-	1121
778	nhn-001	0.0000	775	0.0019	918	-	914	0.0001	626	0.0004	748
779	nhn-002	0.0000	100	0.0004	384	0.0091	251	0.0000	442	0.0003	316
780	nhn-003	0.0000	903	0.0000	116	0.0000	130	0.0001	759	0.0004	668
781	nhn-004	0.0000	932	0.0000	158	0.0000	34	0.0001	761	0.0004	661
782	nhn-005	0.0000	520	0.0000	103	0.0000	124	0.0000	481	0.0004	489
783	noblis-000	-	1358	-	1322	-	916	-	1366	0.0000	95
784	nodeflux-000	-	1274	-	1219	-	1089	0.0001	688	0.0002	286
785	nodeflux-001	0.0000	382	0.0016	881	-	853	0.0001	692	0.0002	283
786	nodeflux-002	0.0000	654	0.0261	1171	-	961	0.0008	1128	0.0005	832
787	nominder-000	0.0000	537	0.0003	272	0.0053	173	0.0000	421	0.0003	385
788	nominder-001	0.0000	710	0.0003	273	0.0053	172	0.0000	433	0.0003	378
789	nominder-002	0.0000	796	0.0006	458	0.0119	297	0.0002	855	0.0003	397
790	nominder-003	0.0000	577	0.0005	423	0.0095	256	0.0002	800	-	1323
791	nominder-004	0.0000	597	0.0007	544	0.0130	313	0.0002	897	-	1365
792	nominder-005	0.0000	319	0.0009	654	0.0206	469	0.0000	450	-	1153
793	nominder-006	0.0000	868	0.0017	890	0.0379	706	0.0003	962	-	1156
794	notiontag-000	0.0000	114	0.0000	114	-	1352	0.0000	42	0.0000	142
795	notiontag-001	0.0000	202	0.0000	33	-	1179	0.0027	1221	0.0000	227
796	notiontag-002	0.0000	437	0.0000	153	0.0000	19	0.0000	253	0.0000	91
797	nsensecorp-001	0.0000	1077	0.0024	970	-	1311	0.0014	1179	0.0101	1078
798	nsensecorp-002	0.0000	494	0.0009	651	0.0219	517	0.0003	921	0.0011	958
799	nsensecorp-003	0.0000	335	0.0000	244	0.0002	143	0.0000	409	0.0007	924
800	nsensecorp-004	0.0406	1214	0.0035	1045	0.0181	414	0.0016	1189	0.0760	1087
801	nsensecorp-005	0.0000	296	0.0000	192	0.0000	50	0.0000	159	0.0000	15
802	ntechlab-000	-	1355	-	1317	-	922	-	1368	0.0016	1016
803	ntechlab-001	-	1289	-	1242	-	1171	-	1322	0.0005	805
804	ntechlab-002	-	1240	-	1274	-	1323	-	1301	0.0005	803
805	ntechlab-003	-	1308	-	1331	-	986	-	1337	0.0005	799
806	ntechlab-004	-	1334	-	1363	-	1080	-	1343	0.0004	506
807	ntechlab-005	-	1296	-	1250	-	1215	0.0000	371	0.0004	497
808	ntechlab-006	-	1297	-	1247	-	1214	0.0000	303	0.0004	442
809	ntechlab-007	0.0000	828	0.0019	920	-	1356	0.0001	584	0.0004	468
810	ntechlab-008	0.0000	889	0.0005	390	-	917	0.0001	609	0.0004	462
811	ntechlab-009	0.0000	951	0.0009	666	-	859	0.0001	722	0.0004	422
812	ntechlab-010	0.0000	765	0.0005	431	0.0107	279	0.0001	678	0.0004	460

Table 98: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
813	ntechlab-011	0.0000	201	0.0003	276	0.0057	178	0.0000	522	0.0004	431
814	ntechlab-012	0.0000	77	0.0003	278	0.0057	179	0.0000	519	0.0004	427
815	omface-000	0.0000	376	0.0000	132	0.0000	6	0.0000	217	0.0000	67
816	omface-001	0.0000	153	0.0000	233	0.0000	140	0.0000	93	0.0000	191
817	omnigarde-000	0.0000	552	0.0008	579	0.0213	502	0.0000	424	0.0004	631
818	omnigarde-001	0.0000	501	0.0008	580	0.0213	503	0.0000	417	0.0004	625
819	omnigarde-002	0.0000	658	0.0008	581	0.0213	501	0.0000	429	0.0004	619
820	omnigarde-003	0.0000	29	0.0007	574	0.0212	497	0.0000	292	0.0004	518
821	omnigarde-004	0.0000	422	0.0007	576	0.0213	500	0.0000	344	-	1223
822	omnigarde-005	0.0000	390	0.0007	575	0.0213	499	0.0000	339	-	1170
823	onfido-000	0.0000	1051	0.0040	1057	0.0804	806	0.0004	985	0.0012	982
824	onfido-001	0.0000	675	0.0006	509	0.0183	419	0.0000	287	-	1157
825	onfido-002	0.0000	695	0.0006	510	0.0183	418	0.0000	285	-	1149
826	ooto-001	0.0000	351	0.0000	218	0.0000	63	0.0000	189	-	1138
827	openedge-000	0.0000	543	0.0014	847	0.0212	495	0.0003	941	0.0004	682
828	openface-001	0.0000	992	0.0104	1146	0.0668	778	0.0004	1006	0.0006	902
829	ovisionllc-001	0.0000	258	0.0000	178	0.0000	45	0.0000	171	-	1116
830	ovisionllc-002	0.0000	352	0.0000	226	0.0000	61	0.0000	181	-	1126
831	oz-001	0.0000	947	0.0011	784	-	1011	0.0006	1099	0.0004	555
832	oz-002	0.0000	322	0.0003	279	-	1058	0.0000	388	0.0003	345
833	oz-003	0.0000	213	0.0002	259	0.0042	163	0.0000	305	0.0003	289
834	oz-004	0.0000	1007	0.0003	291	0.0041	162	0.0000	337	0.0002	262
835	pa-002	-	1348	-	1312	-	892	-	1353	0.0000	58
836	pa-003	-	1227	-	1266	-	1294	-	1274	0.0000	120
837	palit-000	0.0000	683	0.0005	429	0.0134	322	0.0002	822	0.0004	509
838	palit-001	0.0000	641	0.0007	578	0.0201	463	0.0002	821	0.0004	504
839	pangiam-000	0.0000	315	0.0021	952	0.0364	692	0.0001	561	0.0005	788
840	pangiam-001	0.0000	324	0.0005	435	0.0128	308	0.0002	912	0.0003	408
841	pangiam-002	0.0000	433	0.0003	310	0.0072	209	0.0000	416	0.0003	349
842	papago-001	0.0000	853	0.0008	595	0.0159	379	0.0002	908	0.0004	582
843	papil11-000	0.0000	789	0.0008	629	0.0192	452	0.0000	474	0.0003	410
844	papil11-001	0.0000	794	0.0005	402	0.0133	318	0.0000	391	-	1210
845	papil11-002	0.0000	706	0.0004	337	0.0115	292	0.0000	335	-	1137
846	papil11-003	0.0000	155	0.0003	318	0.0077	221	0.0000	300	-	1330
847	papsav1923-001	0.0000	770	0.0007	547	-	921	0.0001	657	0.0002	278
848	papsav1923-002	0.0000	754	0.0018	914	0.0268	610	0.0000	493	0.0004	644
849	papsav1923-003	0.0000	912	0.0019	930	0.0321	654	0.0000	542	0.0004	602
850	paravision-004	0.0000	942	0.0007	567	-	1165	0.0002	834	0.0004	603
851	paravision-006	0.0000	95	0.0000	96	-	1302	0.0000	64	0.0000	160
852	paravision-008	0.0000	62	0.0010	725	0.0201	462	0.0001	629	0.0004	437
853	paravision-010	0.0000	285	0.0010	729	0.0201	460	0.0001	636	0.0004	432
854	paravision-011	0.0000	464	0.0010	728	0.0201	459	0.0001	638	0.0004	435
855	paravision-013	0.0000	250	0.0010	724	0.0201	461	0.0001	634	0.0004	441
856	paravision-015	0.0000	143	0.0009	686	0.0266	609	0.0000	540	-	1339
857	paravision-017	0.0000	576	0.0009	643	0.0220	519	0.0001	618	-	1311
858	paravision-018	0.0000	149	0.0005	440	0.0142	340	0.0000	330	-	1336
859	paravision-020	0.0000	52	0.0004	341	0.0107	277	0.0000	322	-	1237
860	pensees-001	0.0000	493	0.0000	76	-	1292	0.0000	16	0.0000	121
861	pentacomp-000	0.0001	1113	0.0010	708	0.0206	478	0.0004	996	-	1300
862	pixelall-002	0.0000	347	0.0000	220	-	1082	0.0000	192	0.0000	43
863	pixelall-003	0.0000	48	0.0000	74	-	1285	0.0000	17	0.0000	122
864	pixelall-004	0.0000	83	0.0000	88	-	1317	0.0000	73	0.0000	168
865	pixelall-005	0.0000	418	0.0000	147	-	931	0.0000	261	0.0000	102
866	pixelall-006	0.0000	419	0.0000	144	0.0000	24	0.0000	259	0.0000	100
867	pixelall-007	0.0000	327	0.0000	206	0.0000	57	0.0000	204	0.0000	55
868	pixelall-008	0.0000	237	0.0008	614	0.0247	572	0.0000	127	0.0000	219
869	pixelall-009	0.0000	188	0.0000	30	0.0000	84	0.0000	77	0.0000	173
870	pixelall-010	0.0000	225	0.0000	50	0.0000	102	0.0000	123	0.0000	217

Table 99: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
871	pnpsecure-000	0.0000	465	0.0030	1012	0.0390	711	0.0003	916	-	1196
872	privid-001	0.0001	1136	0.0176	1159	0.0598	766	0.0021	1202	0.0021	1027
873	privid-002	0.0198	1207	0.0040	1061	0.0386	709	0.0014	1176	0.0011	967
874	privid-003	0.0000	906	0.0002	263	0.0030	159	0.0001	733	-	1305
875	privid-004	0.0000	769	0.0001	256	0.0025	155	0.0001	614	-	1234
876	psl-000	-	1278	-	1230	-	1141	-	1308	0.0000	182
877	psl-001	-	1261	-	1295	-	1340	0.0000	45	0.0000	147
878	psl-002	-	1356	-	1316	-	923	0.0000	269	0.0000	108
879	psl-003	0.0000	786	0.0007	523	-	902	0.0000	517	0.0004	608
880	psl-004	0.0000	506	0.0007	521	-	1328	0.0000	512	0.0004	613
881	psl-005	0.0000	807	0.0007	517	-	933	0.0000	437	0.0004	563
882	psl-006	0.0000	737	0.0002	260	-	851	0.0000	222	0.0003	288
883	psl-007	0.0000	721	0.0007	525	-	1069	0.0000	526	0.0003	356
884	psl-008	0.0000	750	0.0003	284	0.0068	202	0.0000	338	0.0003	347
885	psl-009	0.0000	580	0.0004	344	0.0095	255	0.0000	277	0.0004	428
886	psl-010	0.0000	748	0.0004	345	0.0095	254	0.0000	288	0.0004	420
887	psl-011	0.0000	699	0.0003	283	0.0063	188	0.0000	283	0.0003	377
888	psl-012	0.0000	602	0.0003	289	0.0067	199	0.0000	279	0.0003	390
889	psl-013	0.0000	593	0.0003	280	0.0063	189	0.0000	505	-	1362
890	psl-014	0.0000	692	0.0003	282	0.0063	187	0.0000	286	-	1148
891	ptakuratsatu-000	0.0000	741	0.0007	562	-	897	0.0001	563	0.0003	337
892	pxl-001	0.0000	1097	0.0044	1075	-	1203	0.0005	1065	0.0022	1033
893	pyramid-000	0.0001	1125	0.0041	1066	-	1161	0.0005	1063	0.0007	921
894	pyramid-001	0.0000	605	0.0008	599	0.0231	546	0.0001	723	-	1359
895	qazbs-000	0.0000	305	0.0009	663	0.0265	605	0.0000	386	0.0004	553
896	qazsmartvisionai-000	0.0000	507	0.0003	321	0.0083	239	0.0000	298	0.0003	351
897	qazsmartvisionai-001	0.0000	772	0.0003	299	0.0064	192	0.0000	319	0.0003	325
898	qazsmartvisionai-002	0.0000	578	0.0003	297	0.0064	194	0.0000	299	-	1326
899	qazsmartvisionai-003	0.0000	734	0.0003	298	0.0064	191	0.0000	314	-	1179
900	qazsmartvisionai-004	0.0000	643	0.0003	300	0.0064	193	0.0000	309	-	1113
901	qluevision-001	0.0000	944	0.0008	604	0.0153	361	0.0008	1127	0.0004	776
902	qnap-000	0.0000	308	0.0007	566	0.0174	402	0.0002	811	0.0002	259
903	qnap-001	0.0000	510	0.0000	241	0.0002	144	0.0000	501	0.0001	252
904	qnap-002	0.0000	1042	0.0033	1027	0.0761	803	0.0004	991	0.0002	260
905	qnap-003	0.0000	186	0.0016	877	0.0402	721	0.0000	533	0.0001	251
906	qnap-004	0.0000	398	0.0016	878	0.0402	720	0.0000	536	0.0001	250
907	qnap-005	0.0001	1109	0.0078	1129	0.0581	760	0.0010	1150	0.0005	863
908	qnap-006	0.0000	871	0.0018	906	0.0427	728	0.0002	849	-	1144
909	quantasoft-003	0.0000	967	0.0015	875	0.0355	688	0.0005	1056	0.0006	890
910	rankone-000	-	1318	-	1340	-	964	-	1331	0.0003	354
911	rankone-001	-	1310	-	1350	-	979	-	1328	0.0000	246
912	rankone-002	-	1344	-	1307	-	856	-	1356	0.0000	242
913	rankone-003	-	1255	-	1288	-	1361	-	1291	0.0000	244
914	rankone-004	-	1345	-	1306	-	855	-	1357	0.0000	243
915	rankone-005	-	1303	-	1339	-	999	0.0000	170	0.0000	26
916	rankone-006	-	1287	-	1235	-	1122	0.0000	78	0.0000	177
917	rankone-007	0.0000	1098	0.0048	1087	-	1057	0.0003	948	0.0004	723
918	rankone-008	0.0000	1078	0.0049	1088	-	1162	0.0003	913	0.0004	430
919	rankone-009	0.0000	414	0.0000	149	-	928	0.0000	260	0.0000	104
920	rankone-010	0.0000	35	0.0000	71	-	1220	0.0000	20	0.0000	127
921	rankone-011	0.0000	28	0.0000	73	0.0000	108	0.0000	19	0.0000	123
922	rankone-012	0.0000	158	0.0000	16	0.0000	73	0.0000	92	0.0000	185
923	rankone-013	0.0000	349	0.0005	408	0.0126	307	0.0000	373	0.0003	298
924	rankone-014	0.0000	162	0.0005	399	0.0129	310	0.0000	370	0.0002	269
925	rankone-015	0.0000	11	0.0000	61	0.0000	110	0.0000	27	0.0000	129
926	realnetworks-000	-	1335	-	1364	-	1079	-	1342	0.0003	320
927	realnetworks-001	-	1250	-	1292	-	1368	0.0004	984	0.0003	322
928	realnetworks-002	0.0000	918	0.0003	312	-	970	0.0004	986	0.0003	318

Table 100: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]							
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
929	realnetworks-003	0.0000	902	0.0003	311	-	1351	0.0004	982	0.0003	321
930	realnetworks-004	0.0000	615	0.0003	275	0.0052	171	0.0000	278	0.0002	282
931	realnetworks-005	0.0000	512	0.0002	266	0.0045	166	0.0000	276	0.0002	285
932	realnetworks-006	0.0000	481	0.0002	267	0.0045	164	0.0000	270	0.0002	281
933	realnetworks-007	0.0000	771	0.0013	838	0.0425	727	0.0000	321	0.0004	589
934	realnetworks-008	0.0000	526	0.0002	268	0.0045	165	0.0000	274	0.0002	284
935	realsense-001	0.0000	531	0.0006	506	0.0177	407	0.0000	420	-	1284
936	rebs-000	0.0000	187	0.0005	400	0.0130	312	0.0000	401	0.0004	491
937	rebs-001	0.0000	412	0.0005	415	0.0144	342	0.0000	465	0.0004	577
938	recognito-000	0.0000	570	0.0003	286	0.0056	176	0.0000	478	0.0003	388
939	recognito-001	0.0000	500	0.0003	287	0.0056	177	0.0000	476	0.0003	383
940	regula-000	0.0000	172	0.0000	11	0.0000	68	0.0000	96	0.0000	192
941	regula-001	0.0000	384	0.0000	126	0.0000	1	0.0000	221	0.0000	70
942	regula-002	0.0000	366	0.0009	699	0.0283	616	0.0000	223	-	1187
943	remarkai-000	-	1270	-	1223	-	1097	0.0000	88	0.0000	187
944	remarkai-001	0.0000	377	0.0000	129	-	858	0.0000	213	0.0000	65
945	remarkai-002	0.0000	278	0.0000	187	-	971	0.0000	161	0.0000	22
946	remarkai-003	0.0000	519	0.0007	539	0.0187	432	0.0000	500	0.0004	490
947	rendip-000	0.0000	925	0.0016	885	0.0293	625	0.0002	815	0.0004	758
948	revealmedia-005	0.0000	940	0.0007	555	0.0189	437	0.0009	1141	0.0004	774
949	revealmedia-006	0.0000	387	0.0009	687	0.0238	557	0.0001	673	0.0004	676
950	roc-016	0.0000	238	0.0000	243	0.0006	148	0.0000	116	0.0000	238
951	roc-017	0.0000	30	0.0003	323	0.0073	211	0.0000	366	-	1252
952	roc-018	0.0000	603	0.0006	498	0.0160	383	0.0000	427	0.0004	474
953	roc-019	0.0000	758	0.0007	537	0.0187	431	0.0000	464	-	1227
954	rokid-000	0.0000	175	0.0072	1121	-	1151	0.0001	643	0.0005	823
955	rokid-001	0.0000	251	0.0013	830	-	1183	0.0000	118	0.0000	211
956	s1-001	0.0000	1096	0.0073	1124	-	1003	0.0013	1166	0.0007	912
957	s1-002	0.0000	874	0.0089	1139	-	1073	0.0001	710	0.0005	828
958	s1-003	0.0000	223	0.0002	262	0.0040	161	0.0007	1115	0.0003	308
959	s1-004	0.0000	340	0.0000	245	0.0003	145	0.0000	549	0.0001	256
960	s1-005	0.0000	240	0.0004	348	0.0120	300	0.0001	588	0.0002	270
961	s1-006	0.0000	469	0.0003	285	0.0074	215	0.0001	581	0.0002	271
962	s1-007	0.0000	256	0.0006	459	0.0110	283	0.0001	593	0.0002	265
963	s1-008	0.0000	601	0.0018	917	0.0252	588	0.0005	1083	-	1364
964	s1-009	0.0000	291	0.0006	461	0.0110	284	0.0001	590	-	1101
965	saffe-001	0.0000	192	0.0000	29	-	1129	0.0000	75	0.0000	172
966	saffe-002	0.0000	227	0.0000	48	-	1207	0.0000	124	0.0000	215
967	samsungsds-000	0.0000	907	0.0055	1104	0.0646	774	0.0038	1234	0.0005	822
968	samsungsds-001	0.0000	98	0.0005	430	0.0146	345	0.0001	631	0.0003	400
969	samsungsds-002	0.0000	31	0.0004	353	0.0119	298	0.0001	630	0.0003	374
970	samtech-000	-	1231	-	1269	-	1282	-	1271	0.0042	1065
971	samtech-001	0.0001	1121	0.0032	1026	-	1263	0.0004	1017	0.0008	926
972	samtech-002	0.0000	1001	0.0018	909	0.0516	743	0.0002	907	0.0005	847
973	scanovate-001	0.0208	1208	0.2388	1211	-	1044	0.0024	1208	0.0014	1004
974	scanovate-002	0.0000	821	0.0018	907	-	1324	0.0000	547	0.0004	753
975	scanovate-003	0.0000	877	0.0233	1169	0.3371	847	0.0006	1090	0.0004	766
976	sdc-000	0.0000	1075	0.0035	1044	0.0678	785	0.0005	1079	0.0011	970
977	seamfix-001	0.0000	55	0.0000	86	0.0000	116	0.0000	2	-	1235
978	securifai-001	0.0000	208	0.0000	31	-	1164	0.0000	281	0.0000	229
979	securifai-002	0.0000	443	0.0000	150	-	903	0.0000	254	0.0000	96
980	securifai-003	0.0000	230	0.0000	44	0.0000	100	0.0000	130	0.0000	221
981	securifai-004	0.0000	312	0.0000	201	0.0000	46	0.0000	148	0.0000	8
982	securifai-005	0.0000	336	0.0000	214	0.0000	52	0.0000	195	0.0000	47
983	securifai-006	0.0000	304	0.0000	204	0.0000	48	0.0000	144	0.0000	3
984	securifai-007	0.0000	6	0.0000	67	0.0000	111	0.0000	29	0.0000	134
985	securifai-008	0.0000	232	0.0000	42	0.0000	101	0.0000	132	-	1350
986	sensetime-001	-	1244	-	1285	-	1310	0.0000	444	0.0004	579

Table 101: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]							
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
987	sensetime-002	0.0004	1156	0.0082	1133	-	1062	0.0011	1160	0.0005	857
988	sensetime-003	0.0000	545	0.0011	780	-	1345	0.0000	273	0.0004	592
989	sensetime-004	0.0000	740	0.0011	779	-	900	0.0000	290	0.0004	588
990	sensetime-005	0.0000	415	0.0004	343	0.0106	266	0.0000	453	0.0003	341
991	sensetime-006	0.0000	394	0.0004	342	0.0106	265	0.0000	452	0.0003	338
992	sensetime-007	0.0000	173	0.0004	340	0.0106	267	0.0000	445	0.0003	344
993	sensetime-008	0.0000	119	0.0007	560	0.0250	579	0.0000	272	0.0003	412
994	sensetime-010	0.0000	448	0.0005	427	0.0111	286	0.0000	496	-	1203
995	serendipity-000	0.0000	806	0.0008	600	0.0202	465	0.0001	757	0.0004	607
996	sertis-000	0.0000	358	0.0007	551	-	1065	0.0000	555	0.0004	533
997	sertis-001	0.0000	126	0.0004	385	-	1337	0.0002	853	0.0005	870
998	sertis-002	0.0000	99	0.0007	533	0.0152	356	0.0000	538	0.0004	546
999	sertis-003	0.0000	587	0.0008	613	0.0183	417	0.0000	470	0.0004	615
1000	seventhsense-000	0.0000	777	0.0006	502	0.0184	422	0.0001	573	0.0004	624
1001	seventhsense-001	0.0000	604	0.0006	500	0.0184	423	0.0001	572	0.0004	635
1002	seventhsense-002	0.0000	397	0.0003	319	0.0076	219	0.0000	556	0.0004	421
1003	seventhsense-003	0.0000	596	0.0003	307	0.0083	240	0.0000	372	0.0002	280
1004	seventhsense-005	0.0000	618	0.0002	270	0.0065	196	0.0000	385	0.0003	307
1005	seventhsense-006	0.0000	585	0.0002	269	0.0065	195	0.0000	380	-	1303
1006	shaman-000	0.0000	281	0.0000	182	-	962	0.0000	168	0.0000	24
1007	shaman-001	0.0000	37	0.0000	70	-	1222	0.0000	22	0.0000	126
1008	shu-001	0.0000	1049	0.0022	959	-	1289	0.0010	1147	0.0006	886
1009	shu-002	0.0000	881	0.0010	743	-	857	0.0005	1043	0.0004	725
1010	shu-003	0.0000	360	0.0007	528	-	871	0.0001	577	0.0003	330
1011	siat-002	0.0000	509	0.0012	807	-	1331	0.0000	486	0.0004	596
1012	siat-004	0.0000	479	0.0011	777	-	1249	0.0000	441	0.0004	578
1013	siat-005	0.0000	151	0.0000	4	0.0000	137	0.0000	108	0.0000	203
1014	sightropic-000	0.0000	854	0.0006	492	0.0138	326	0.0002	901	-	1357
1015	sightropic-001	0.0000	811	0.0037	1052	0.0261	600	0.0007	1123	-	1265
1016	sjtu-001	0.0000	846	0.0010	761	-	1140	0.0005	1055	0.0004	754
1017	sjtu-002	0.0000	860	0.0010	744	-	1002	0.0005	1042	0.0004	720
1018	sjtu-003	0.0000	80	0.0005	443	-	1318	0.0000	520	0.0003	317
1019	sjtu-004	0.0000	325	0.0000	209	0.0000	58	0.0000	205	0.0003	310
1020	sjtu-005	0.0000	1085	0.0000	141	0.0000	21	0.0000	267	0.0006	885
1021	sjtu-006	0.0000	747	0.0026	978	0.0298	627	0.0002	791	-	1162
1022	sjtu-007	0.0000	79	0.0002	265	0.0054	174	0.0000	275	-	1296
1023	sjtu-008	0.0000	125	0.0003	292	0.0074	216	0.0000	44	-	1277
1024	sktelecom-000	0.0000	716	0.0008	615	0.0190	441	0.0000	525	0.0004	641
1025	smartbiometrik-001	0.0005	1158	0.0649	1195	0.2147	840	0.0017	1191	0.0008	934
1026	smartengines-000	0.0066	1194	0.0150	1156	0.1656	829	0.0022	1203	0.0013	1001
1027	smartengines-001	0.0003	1151	0.0073	1122	0.0714	797	0.0007	1112	0.0005	835
1028	smartvist-000	0.0000	396	0.0026	987	0.0357	690	0.0002	770	0.0011	972
1029	smartvist-001	0.0000	648	0.0005	406	0.0069	206	0.0001	730	0.0003	355
1030	smilart-001	-	1263	-	1217	-	1118	-	1314	0.0273	1083
1031	smilart-002	0.0000	1068	0.0036	1049	-	1255	-	1280	0.0011	968
1032	smilart-003	0.0003	1152	0.0100	1144	-	940	0.0014	1174	0.0013	1003
1033	sodec-000	0.0000	109	0.0000	105	0.0000	132	0.0000	53	0.0000	153
1034	sparktek-000	0.0000	989	0.0016	880	0.0356	689	0.0001	623	-	1363
1035	sparsh-001	0.0000	112	0.0007	514	0.0168	393	0.0000	325	0.0004	488
1036	sqisoft-001	0.0000	193	0.0003	306	0.0078	223	0.0000	348	0.0003	401
1037	sqisoft-002	0.0000	54	0.0003	302	0.0078	224	0.0000	365	0.0003	411
1038	sqisoft-003	0.0000	429	0.0003	309	0.0078	226	0.0000	376	0.0003	348
1039	staqu-000	0.0000	294	0.0000	193	-	1029	0.0000	158	0.0000	17
1040	starhybrid-001	0.0001	1129	0.0033	1038	-	1274	0.0009	1140	0.0023	1036
1041	stcon-000	0.0000	636	0.0017	903	0.0301	633	0.0000	432	0.0003	370
1042	stcon-001	0.0000	690	0.0017	904	0.0301	634	0.0000	434	0.0003	371
1043	stcon-002	0.0000	634	0.0011	769	0.0226	529	0.0000	407	0.0003	319
1044	stcon-003	0.0000	122	0.0005	412	0.0142	339	0.0000	397	0.0004	487

Table 102: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
1045	stcon-004	0.0000	332	0.0005	414	0.0142	337	0.0000	408	-	1141
1046	stcon-005	0.0000	39	0.0005	411	0.0142	338	0.0000	394	-	1245
1047	stcon-006	0.0000	113	0.0007	522	0.0191	447	0.0000	419	-	1270
1048	stcon-007	0.0000	470	0.0007	524	0.0191	445	0.0000	438	-	1202
1049	stcon-008	0.0000	241	0.0007	520	0.0191	446	0.0000	425	-	1341
1050	stengg-000	0.0000	297	0.0013	834	0.0350	686	0.0000	459	0.0004	604
1051	sukshi-000	0.0000	177	0.0000	25	0.0000	87	0.0000	81	0.0000	180
1052	sumsub-000	0.0000	972	0.0018	915	0.0189	436	0.0011	1159	-	1229
1053	suprema-000	0.0000	814	0.0017	896	-	1228	0.0002	850	0.0004	664
1054	suprema-001	0.0000	899	0.0027	989	0.0471	736	0.0003	929	0.0004	750
1055	suprema-002	0.0000	834	0.0010	751	0.0271	613	0.0002	802	0.0004	549
1056	suprema-003	0.0000	711	0.0008	621	0.0231	547	0.0000	356	0.0004	534
1057	suprema-004	0.0000	572	0.0014	851	0.0299	628	0.0000	351	0.0004	550
1058	suprema-005	0.0000	809	0.0014	852	0.0299	629	0.0005	1049	0.0004	665
1059	supremaid-001	0.0000	508	0.0020	938	0.0330	665	0.0001	658	0.0004	752
1060	supremaid-002	0.0000	687	0.0020	940	0.0330	664	0.0001	660	0.0004	746
1061	surrey-cvssp-000	0.0000	416	0.0000	148	0.0000	26	0.0000	262	0.0000	103
1062	surrey-cvssp-001	0.0173	1206	0.0007	534	0.0179	409	0.0011	1158	0.0015	1011
1063	surrey-cvssp-002	0.0000	1022	0.0006	473	0.0156	370	0.0001	625	0.0004	574
1064	surrey-cvssp-003	0.0000	220	0.0009	653	0.0165	389	0.0000	137	0.0001	253
1065	surrey-cvssp-004	0.0000	530	0.0015	871	0.0311	644	0.0004	988	-	1292
1066	swsam-001	0.0000	439	0.0012	817	0.0263	603	0.0000	251	0.0000	93
1067	synesis-000	-	1280	-	1228	-	1145	-	1309	0.0007	914
1068	synesis-001	-	1277	-	1231	-	1150	0.0035	1229	0.0021	1026
1069	synesis-003	-	1360	-	1321	-	904	0.0102	1257	0.1184	1091
1070	synesis-004	-	1230	-	1263	-	1286	0.0164	1262	0.0035	1056
1071	synesis-005	0.0000	582	0.0019	921	-	1137	0.0001	640	0.0005	783
1072	synesis-006	0.0000	262	0.0003	316	-	993	0.0000	523	0.0003	296
1073	synesis-007	0.0000	625	0.0013	829	-	1184	0.0002	872	0.0004	601
1074	synology-000	0.0000	14	0.0000	58	-	1248	0.0000	37	0.0000	138
1075	synology-001	0.0000	265	0.0000	177	-	989	0.0000	177	0.0000	34
1076	synology-002	0.0000	367	0.0000	120	-	865	0.0000	233	0.0000	78
1077	syscake-000	0.0008	1174	0.0017	902	0.0287	623	0.0007	1109	-	1356
1078	szpu-000	0.0000	410	0.0014	862	0.0330	666	0.0001	597	-	1230
1079	sztu-000	0.0000	276	0.0000	184	-	975	0.0000	164	0.0000	19
1080	sztu-001	0.0000	102	0.0000	107	0.0000	135	0.0000	48	0.0000	148
1081	t4isb-000	0.0000	309	0.0000	200	0.0000	47	0.0000	149	0.0000	7
1082	tahakom-001	0.0025	1181	0.0020	947	0.0139	328	0.0020	1196	-	1110
1083	taiwanmobile-001	0.0000	954	0.0023	969	0.0331	668	0.0006	1092	-	1165
1084	taiwanmobile-002	0.0000	941	0.0015	864	0.0238	559	0.0004	1026	-	1367
1085	tcv-001	0.0000	780	0.0013	818	0.0152	359	0.0001	752	-	1220
1086	tech5-000	-	1217	-	1259	-	1261	-	1281	0.0003	399
1087	tech5-001	-	1249	-	1281	-	1299	0.0004	1009	0.0003	366
1088	tech5-002	-	1223	-	1254	-	1241	0.0001	615	0.0003	292
1089	tech5-003	0.0000	878	0.0005	416	-	1063	0.0001	616	0.0003	306
1090	tech5-004	0.0000	528	0.0008	589	-	1300	0.0003	930	0.0004	743
1091	tech5-005	0.0000	661	0.0007	570	-	1032	0.0000	430	0.0004	673
1092	tech5-007	0.0000	619	0.0014	859	0.0305	640	0.0000	384	0.0004	526
1093	tech5-008	0.0000	474	0.0007	516	0.0168	392	0.0000	341	0.0004	483
1094	tech5-009	0.0000	915	0.0030	1015	0.0542	753	0.0002	845	-	1349
1095	techainer-001	0.0000	1045	0.0004	380	0.0085	244	0.0005	1051	0.0004	658
1096	techainer-002	0.0000	1043	0.0004	374	0.0085	245	0.0005	1050	-	1297
1097	techbiometricid-001	0.0000	270	0.0000	174	0.0000	42	0.0000	174	-	1123
1098	techsign-000	0.0007	1167	0.0334	1180	0.2093	834	0.0020	1198	0.0011	963
1099	techsign-001	0.0000	477	0.0008	635	0.0253	589	0.0002	825	0.0004	612
1100	telexper-000	0.0000	891	0.0006	496	0.0147	346	0.0003	963	-	1218
1101	tevian-000	-	1328	-	1358	-	1045	-	1348	0.0012	994
1102	tevian-001	-	1247	-	1282	-	1304	-	1294	0.0012	993

Table 103: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
1103	tevian-002	-	1236	-	1279	-	1332	-	1297	0.0005	865
1104	tevian-003	-	1268	-	1226	-	1100	0.0003	932	0.0005	866
1105	tevian-004	0.0000	973	0.0024	971	-	951	0.0002	799	0.0005	855
1106	tevian-005	0.0001	1133	0.0041	1063	-	913	0.0006	1093	0.0006	904
1107	tevian-006	0.0000	207	0.0012	797	-	1168	0.0003	943	0.0005	831
1108	tevian-007	0.0000	536	0.0015	876	0.0429	729	0.0002	843	0.0004	648
1109	tevian-008	0.0000	561	0.0006	455	0.0109	281	0.0000	405	0.0003	333
1110	tiger-001	-	1331	-	1359	-	1042	-	1346	0.0006	892
1111	tiger-002	0.0000	637	0.0010	732	-	988	0.0001	702	0.0004	557
1112	tiger-003	0.0000	549	-	1296	-	1339	0.0001	696	0.0004	569
1113	tiger-004	0.0000	1091	0.0022	958	-	1047	0.0001	706	0.0004	734
1114	tiger-005	0.0000	498	0.0009	689	0.0194	456	0.0001	621	0.0004	565
1115	tiger-006	0.0000	831	0.0011	778	0.0396	714	0.0001	731	0.0004	773
1116	tiger-007	0.0000	896	0.0051	1093	0.0201	464	0.0002	818	-	1194
1117	tinkoff-001	0.0000	893	0.0008	612	0.0171	399	0.0001	717	0.0004	564
1118	tngd-001	0.0000	714	0.0009	637	0.0218	513	0.0000	492	-	1124
1119	tnitech-000	0.0000	651	0.0003	304	0.0060	181	0.0005	1080	0.0003	323
1120	tongyi-004	-	1336	-	1368	-	1074	-	1339	0.0006	896
1121	tongyi-005	0.0000	328	0.0000	208	-	1054	0.0000	203	0.0000	56
1122	tongyitrans-001	-	1267	-	1224	-	1103	-	1312	0.0040	1061
1123	tongyitrans-002	-	1337	-	1367	-	1064	-	1340	0.0040	1060
1124	tongyitrans-003	-	1291	-	1240	-	1174	-	1323	0.0006	898
1125	toppanidgate-000	0.0000	551	0.0008	605	0.0232	548	0.0004	983	0.0004	628
1126	toshiba-000	-	1262	-	1294	-	1338	-	1286	0.0000	145
1127	toshiba-001	-	1260	-	1298	-	1349	-	1285	0.0000	143
1128	toshiba-002	0.0000	243	0.0000	54	-	1189	0.0000	113	0.0000	206
1129	toshiba-003	0.0000	263	0.0001	250	-	996	0.0001	703	0.0001	255
1130	toshiba-004	0.0000	248	0.0000	53	0.0000	97	0.0000	120	0.0000	212
1131	toshiba-005	0.0000	534	0.0004	360	0.0050	169	0.0001	724	0.0003	332
1132	toshiba-006	0.0000	785	0.0004	361	0.0050	168	0.0001	726	0.0003	331
1133	toshiba-007	0.0000	816	0.0005	410	0.0082	238	0.0002	892	0.0004	611
1134	toshiba-008	0.0000	887	0.0005	413	0.0082	237	0.0002	893	0.0004	605
1135	toshiba-009	0.0000	573	0.0004	383	0.0070	208	0.0002	879	-	1318
1136	toshiba-010	0.0000	876	0.0004	349	0.0064	190	0.0002	870	-	1129
1137	toshiba-011	0.0000	712	0.0006	465	0.0137	324	0.0002	866	-	1127
1138	toshiba-012	0.0000	802	0.0004	387	0.0120	301	0.0000	552	-	1192
1139	toss-000	0.0000	386	0.0009	660	0.0209	484	0.0001	648	-	1181
1140	touchlessid-000	0.0042	1186	0.0133	1153	0.2009	833	0.0018	1194	0.0032	1053
1141	touchlessid-001	0.0000	357	0.0036	1050	0.0923	814	0.0000	184	0.0000	35
1142	touchlessid-002	0.0000	160	0.0043	1073	0.1087	819	0.0000	89	0.0000	188
1143	touchlessid-003	0.0000	657	0.0010	736	0.0287	622	0.0002	773	0.0004	732
1144	touchlessid-004	0.0000	1089	0.0013	843	0.0398	717	0.0002	889	-	1232
1145	transmitsecurity-001	0.0000	679	0.0009	658	0.0226	530	0.0000	485	-	1161
1146	trueface-000	0.0000	666	0.0000	205	-	1023	0.0000	147	0.0000	4
1147	trueface-001	0.0000	818	0.0038	1056	-	1278	0.0007	1122	0.0005	829
1148	trueface-002	0.0000	847	0.0046	1082	-	1138	0.0003	918	0.0005	856
1149	trueface-003	0.0000	895	0.0046	1083	0.0397	716	0.0003	919	0.0005	854
1150	trueidvng-001	0.0000	826	0.0020	946	0.0385	708	0.0002	830	0.0005	820
1151	truststamp-001	0.0000	735	0.0010	726	0.0189	438	0.0000	374	0.0003	372
1152	truststamp-002	0.0000	795	0.0010	727	0.0189	439	0.0000	375	-	1206
1153	truststamp-003	0.0000	567	0.0010	722	0.0189	440	0.0000	368	-	1328
1154	ttigroup-000	0.0000	245	0.0000	52	0.0000	98	0.0000	121	-	1346
1155	tuputech-000	0.0003	1154	0.0116	1151	-	1296	-	1276	0.0081	1074
1156	turingtechvip-001	0.0001	1114	0.0007	557	0.0061	185	0.0007	1114	0.0006	882
1157	turingtechvip-002	0.0001	1115	0.0017	900	0.0097	257	0.0007	1113	0.0006	881
1158	turkcell-000	0.0110	1200	0.0234	1170	0.0350	687	0.0103	1258	0.0306	1085
1159	turkcell-001	0.0000	183	0.0002	264	0.0034	160	0.0001	641	0.0003	293
1160	turkcell-002	0.0000	45	0.0002	258	0.0026	156	0.0001	571	-	1248

Table 104: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
1161	twface-000	0.0000	405	0.0000	136	0.0000	13	0.0000	210	0.0000	64
1162	twface-001	0.0000	194	0.0000	27	0.0000	83	0.0000	80	0.0000	178
1163	ulsee-001	0.0000	66	0.0000	77	-	1268	0.0000	11	0.0000	115
1164	ultinous-000	-	1285	-	1236	-	1131	-	1302	0.0003	352
1165	ultinous-001	-	1351	-	1311	-	882	-	1349	0.0003	346
1166	uluface-002	0.0000	424	0.0000	145	-	924	0.0000	257	0.0000	101
1167	uluface-003	0.0000	61	0.0001	255	-	1272	0.0002	775	0.0002	273
1168	unicc-001	0.0000	184	0.0012	795	0.0230	544	0.0004	1031	0.0004	571
1169	unicc-002	0.0316	1213	0.0082	1132	0.0188	433	0.0226	1266	0.0936	1090
1170	unicc-003	0.0007	1170	0.0022	955	0.0094	253	0.0026	1218	0.0029	1046
1171	unicc-004	0.0000	1086	0.0012	793	0.0066	198	0.0012	1164	-	1321
1172	unissey-001	0.0000	166	0.0000	13	0.0000	70	0.0000	97	0.0000	194
1173	unissey-002	0.0000	34	0.0000	68	0.0000	106	0.0000	23	0.0000	124
1174	unissey-003	0.0000	447	0.0008	585	0.0191	442	0.0001	639	0.0004	515
1175	unissey-004	0.0000	27	0.0009	668	0.0240	561	0.0001	675	0.0004	590
1176	unissey-005	0.0000	148	0.0009	667	0.0240	560	0.0001	676	-	1337
1177	unissey-006	0.0000	669	0.0220	1166	0.0583	761	0.0003	951	-	1094
1178	upc-001	0.0000	1002	0.0003	296	-	1176	0.0003	922	0.0003	391
1179	urielsoft-000	0.0000	244	0.0023	967	0.0371	700	0.0000	529	-	1343
1180	useb-000	0.0000	768	0.0009	680	0.0228	532	0.0001	742	0.0004	517
1181	useb-001	0.0000	590	0.0009	676	0.0228	537	0.0001	734	0.0004	522
1182	useb-002	0.0000	642	0.0009	681	0.0228	533	0.0001	738	0.0004	503
1183	useb-003	0.0000	527	0.0009	678	0.0228	539	0.0001	732	-	1293
1184	useb-004	0.0000	696	0.0004	381	0.0112	288	0.0002	839	-	1146
1185	uxlabs-001	0.0000	421	0.0000	143	0.0000	25	0.0000	258	0.0000	99
1186	uxlabs-003	0.0000	266	0.0000	173	0.0000	43	0.0000	176	0.0000	31
1187	uzinfocom-000	0.0000	320	0.0005	403	0.0132	317	0.0001	684	-	1152
1188	vaidio-001	0.0000	723	0.0006	490	0.0157	372	0.0043	1238	-	1128
1189	vcog-002	-	1347	-	1313	-	891	-	1352	0.0019	1023
1190	vcortex-001	0.0000	1030	0.2295	1210	0.0802	805	0.0017	1190	0.0006	880
1191	vd-000	-	1222	-	1255	-	1238	-	1282	0.0000	137
1192	vd-001	0.0000	1056	0.0030	1017	-	978	0.0004	1014	0.0009	937
1193	vd-002	0.0000	344	0.0000	222	1.0000	1084	0.0000	185	0.0000	37
1194	vd-003	0.0001	1116	0.0041	1062	0.0676	782	0.0030	1226	0.0029	1047
1195	veridas-001	-	1271	-	1222	-	1098	0.0001	697	0.0005	815
1196	veridas-002	0.0000	980	0.0026	986	-	1234	0.0001	694	0.0005	811
1197	veridas-003	0.0000	996	0.0026	981	-	949	0.0001	707	0.0005	810
1198	veridas-004	0.0000	982	0.0026	984	-	1223	0.0001	695	0.0005	812
1199	veridas-005	0.0000	987	0.0026	979	-	1116	0.0001	698	0.0005	816
1200	veridas-006	0.0000	993	0.0026	982	0.0595	762	0.0001	701	0.0005	806
1201	veridas-007	0.0000	990	0.0026	980	0.0595	764	0.0001	699	0.0005	819
1202	veridas-008	0.0000	994	0.0026	983	0.0595	763	0.0001	705	0.0005	809
1203	veridas-009	0.0000	983	0.0026	985	0.0597	765	0.0001	633	0.0005	821
1204	veridas-010	0.0000	883	0.0011	782	0.0212	496	0.0004	1024	-	1184
1205	veridium-000	0.0061	1193	0.5956	1213	0.2889	845	0.0050	1245	0.0009	936
1206	veridium-001	0.0001	1106	0.0087	1137	0.1615	826	0.0014	1177	0.0006	874
1207	veridium-002	0.0000	1095	0.0083	1136	0.1591	824	0.0010	1144	0.0005	851
1208	veridium-003	0.0001	1107	0.0087	1138	0.1615	825	0.0014	1178	-	1176
1209	verigram-000	0.0000	898	0.0068	1116	0.0822	809	0.0003	974	0.0005	839
1210	verigram-001	0.0000	861	0.0003	303	0.0060	180	0.0002	865	0.0003	393
1211	verigram-002	0.0000	1029	0.0052	1099	0.0378	705	0.0010	1146	0.0006	901
1212	verigram-003	0.0000	1070	0.0025	975	0.0288	624	0.0009	1143	0.0008	930
1213	verihubs-inteligensia-000	0.0000	650	0.0029	1004	0.0669	781	0.0001	592	0.0004	674
1214	verihubs-inteligensia-001	0.0000	733	0.0029	1002	0.0669	779	0.0001	595	0.0004	677
1215	verihubs-inteligensia-002	0.0000	778	0.0029	1003	0.0669	780	0.0001	596	0.0004	678
1216	verijelas-000	0.0000	742	0.0023	965	0.0375	703	0.0004	1038	0.0006	888
1217	via-000	0.0000	306	0.0000	203	-	1018	0.0000	145	0.0000	2
1218	via-001	0.0000	451	0.0000	161	-	954	0.0000	243	0.0000	84

Table 105: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
1219	via-004	0.0000	440	0.0000	151	0.0000	17	0.0000	256	0.0000	97
1220	via-005	0.0000	97	0.0000	110	0.0000	136	0.0000	50	0.0000	150
1221	via-006	0.0000	4	0.0000	65	0.0000	112	0.0000	32	-	1258
1222	viante-000	0.0000	886	0.0008	618	0.0168	395	0.0001	674	0.0004	769
1223	viante-001	0.0000	843	0.0008	616	0.0168	396	0.0001	672	-	1325
1224	viante-002	0.0000	584	0.0007	568	0.0154	363	0.0001	671	-	1308
1225	videmo-000	0.0000	884	0.0019	926	-	854	0.0003	952	0.0012	991
1226	videmo-001	0.0000	960	0.0170	1158	0.0332	670	0.0010	1153	0.0011	978
1227	videmo-002	0.0000	141	0.0006	486	0.0189	434	0.0001	654	0.0004	494
1228	videmo-003	0.0000	91	0.0006	488	0.0189	435	0.0001	653	-	1288
1229	videonetics-001	0.0004	1155	0.0309	1177	-	1265	0.0015	1183	0.0010	951
1230	videonetics-002	0.0000	928	0.0459	1190	-	915	0.0006	1097	0.0005	859
1231	viettelai-004	0.0000	804	0.0005	425	0.0139	329	0.0000	463	-	1200
1232	viettelhightech-000	0.0000	1020	0.0019	929	0.0368	697	0.0007	1118	0.0005	852
1233	viettelhightech-001	0.0000	499	0.0014	848	0.0434	731	0.0001	758	-	1247
1234	viettelhightech-002	0.0000	728	0.0014	849	0.0434	730	0.0001	760	-	1191
1235	vigilantsolutions-000	-	1269	-	1221	-	1099	-	1311	0.0007	913
1236	vigilantsolutions-001	-	1218	-	1258	-	1252	-	1278	0.0004	696
1237	vigilantsolutions-002	-	1242	-	1272	-	1316	-	1299	0.0004	699
1238	vigilantsolutions-003	-	1290	-	1241	-	1172	-	1324	0.0004	476
1239	vigilantsolutions-004	-	1243	-	1273	-	1314	-	1298	0.0004	470
1240	vigilantsolutions-005	-	1350	-	1310	-	885	0.0001	605	0.0004	454
1241	vigilantsolutions-006	0.0000	970	0.0028	996	-	874	0.0001	606	0.0004	456
1242	vigilantsolutions-007	0.0000	964	0.0028	993	-	1159	0.0001	601	0.0004	475
1243	vigilantsolutions-008	0.0000	959	0.0028	994	-	1298	0.0001	600	0.0004	469
1244	vigilantsolutions-009	0.0000	969	0.0028	998	-	1078	0.0001	604	0.0004	452
1245	vigilantsolutions-010	0.0000	966	0.0028	997	0.0609	768	0.0001	603	0.0004	448
1246	vigilantsolutions-011	0.0000	971	0.0028	995	0.0609	767	0.0001	607	0.0004	457
1247	vinai-000	0.0000	472	0.0000	167	-	935	0.0000	239	0.0000	83
1248	vinbigdata-001	0.0000	203	0.0000	34	0.0000	94	0.0000	140	0.0000	228
1249	vinbigdata-002	0.0000	190	0.0015	870	0.0250	580	0.0000	477	0.0004	715
1250	vinbigdata-003	0.0000	766	0.0007	530	0.0151	355	0.0000	558	0.0004	485
1251	vinbigdata-004	0.0000	684	0.0005	422	0.0141	333	0.0000	358	-	1160
1252	vinbigdata-005	0.0000	757	0.0005	420	0.0141	331	0.0000	360	-	1166
1253	vinbigdata-006	0.0000	783	0.0005	421	0.0141	332	0.0000	363	-	1217
1254	vinbigdata-007	0.0000	732	0.0005	419	0.0141	330	0.0000	361	-	1178
1255	vion-000	0.0050	1188	0.0392	1187	-	899	0.0130	1261	0.0078	1073
1256	visage-000	0.0000	1021	0.0054	1102	-	1067	0.0009	1138	0.0006	883
1257	visica-001	0.0000	1054	0.0068	1118	0.0692	788	0.0010	1145	-	1276
1258	visica-002	0.0000	825	0.0080	1130	0.1006	817	0.0004	1016	-	1282
1259	visionbox-000	0.0000	1074	0.0033	1037	-	1010	0.0005	1076	0.0011	969
1260	visionbox-001	0.0000	1076	0.0033	1036	-	884	0.0005	1077	0.0011	971
1261	visionbox-002	0.0000	176	0.0017	891	0.0270	612	0.0000	482	0.0004	764
1262	visionbox-003	0.0000	924	0.0010	712	0.0209	487	0.0001	662	0.0004	646
1263	visionbox-004	0.0000	820	0.0013	820	0.0248	575	0.0001	725	0.0004	729
1264	visionbox-005	0.0000	956	0.0037	1054	0.0301	635	0.0005	1040	-	1244
1265	visionbox-006	0.0000	1009	0.0040	1060	0.0331	667	0.0007	1108	-	1298
1266	visionlabs-001	-	1367	-	1329	-	938	-	1364	0.0014	1008
1267	visionlabs-002	-	1342	-	1301	-	860	-	1362	0.0026	1040
1268	visionlabs-003	-	1299	-	1252	-	1192	-	1316	0.0025	1039
1269	visionlabs-004	-	1259	-	1299	-	1348	-	1284	0.0008	931
1270	visionlabs-005	-	1264	-	1216	-	1120	0.0002	911	0.0023	1034
1271	visionlabs-006	-	1294	-	1249	-	1217	0.0003	958	0.0005	817
1272	visionlabs-007	0.0000	844	0.0014	856	-	1139	0.0003	955	0.0005	804
1273	visionlabs-008	0.0000	556	0.0015	868	-	1113	0.0002	904	0.0004	765
1274	visionlabs-009	0.0000	607	0.0010	716	-	1156	0.0001	568	0.0004	634
1275	visionlabs-010	0.0000	952	0.0009	657	-	852	0.0001	729	0.0004	623
1276	visionlabs-011	0.0000	330	0.0006	481	0.0156	371	0.0001	611	0.0004	480

Table 106: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
1277	visteam-000	0.0000	1072	0.0031	1023	-	883	0.0005	1069	0.0011	959
1278	visteam-001	0.0000	953	0.0014	853	-	876	0.0002	814	0.0004	645
1279	visteam-002	0.0000	948	0.0014	854	0.0285	620	0.0002	806	0.0004	637
1280	visteam-003	0.0000	592	0.0010	746	0.0225	526	0.0001	575	0.0004	552
1281	visteam-004	0.0000	667	0.0010	747	0.0225	523	0.0001	677	0.0004	530
1282	visteam-005	0.0000	744	0.0010	745	0.0224	522	0.0001	612	0.0004	537
1283	visteam-006	0.0000	487	0.0008	607	0.0209	482	0.0000	323	0.0004	463
1284	visteam-007	0.0000	788	0.0008	609	0.0209	481	0.0000	342	0.0004	459
1285	visteam-008	0.0000	550	0.0008	608	0.0209	483	0.0000	324	0.0004	465
1286	visteam-009	0.0000	703	0.0010	763	0.0328	661	0.0000	336	-	1140
1287	visteam-010	0.0000	588	0.0010	762	0.0328	662	0.0000	326	-	1304
1288	vivotek-001	0.0000	43	0.0006	479	0.0161	385	0.0000	15	-	1243
1289	vivotek-002	0.0000	174	0.0006	478	0.0161	384	0.0000	85	-	1316
1290	vixvizion-000	0.0002	1142	0.0028	999	-	984	0.0010	1151	0.0012	990
1291	vixvizion-001	0.0000	885	0.0030	1016	-	898	0.0001	686	0.0004	659
1292	vixvizion-002	0.0000	908	0.0018	905	-	1133	0.0000	490	0.0004	650
1293	vixvizion-003	0.0000	364	0.0000	124	-	867	0.0000	225	0.0000	74
1294	vixvizion-004	0.0000	87	0.0000	101	0.0000	121	0.0000	58	0.0000	156
1295	vixvizion-005	0.0000	58	0.0000	84	0.0000	118	0.0000	3	0.0000	110
1296	vixvizion-006	0.0000	94	0.0000	97	0.0000	120	0.0000	65	0.0000	161
1297	vixvizion-007	0.0000	348	0.0000	219	0.0000	66	0.0000	193	0.0000	42
1298	vnis-000	0.0007	1172	0.0695	1199	0.0756	802	0.0038	1235	0.0009	942
1299	vnpay-000	0.0000	965	0.0657	1198	0.0693	789	0.0037	1233	0.0006	875
1300	vnpay-001	0.0000	681	0.0052	1098	0.0497	738	0.0001	685	-	1158
1301	vnpt-001	0.0652	1216	0.2829	1212	-	1158	0.2116	1269	0.1598	1092
1302	vnpt-002	0.0000	713	0.0002	261	0.0024	154	0.0003	959	0.0003	297
1303	vnpt-003	0.0000	68	0.0004	335	0.0105	264	0.0002	771	0.0004	424
1304	vnpt-004	0.0000	672	0.0006	463	0.0160	382	0.0002	795	0.0004	554
1305	vnpt-005	0.0000	407	0.0006	449	0.0154	364	0.0002	827	0.0004	536
1306	vnpt-006	0.0000	413	0.0006	450	0.0154	366	0.0002	829	0.0004	545
1307	vnpt-007	0.0000	50	0.0006	447	0.0154	368	0.0002	824	-	1239
1308	vnpt-008	0.0000	23	0.0006	446	0.0154	367	0.0002	826	-	1261
1309	vnpt-009	0.0000	388	0.0006	448	0.0154	365	0.0002	828	-	1171
1310	vocalize-001	0.0216	1209	0.0193	1161	0.1691	830	0.0068	1252	-	1286
1311	vocord-001	-	1276	-	1232	-	1149	-	1307	0.0038	1059
1312	vocord-002	-	1286	-	1234	-	1125	-	1306	0.0037	1058
1313	vocord-003	-	1256	-	1286	-	1357	-	1289	0.0776	1088
1314	vocord-004	-	1313	-	1347	-	973	0.0005	1068	0.0003	309
1315	vocord-005	-	1321	-	1352	-	1030	0.0013	1168	0.0003	392
1316	vocord-006	-	1233	-	1270	-	1281	0.0003	944	0.0003	362
1317	vocord-007	0.0000	835	0.0535	1191	-	1096	0.0001	747	0.0004	429
1318	vocord-008	0.0000	541	0.0015	874	-	1347	0.0003	964	0.0001	254
1319	vocord-009	0.0000	782	0.0006	480	-	911	0.0001	754	0.0003	299
1320	vocord-010	0.0000	897	0.0005	434	0.0141	335	0.0002	832	0.0003	396
1321	vsoft-001	0.0069	1196	0.8292	1214	0.8200	849	0.0173	1263	-	1097
1322	vsoft-002	0.0026	1182	0.0029	1009	0.0613	769	0.0059	1251	-	1134
1323	vtcc-000	0.0000	409	0.0000	133	0.0000	12	0.0000	209	0.0000	61
1324	vtcc-001	0.0000	851	0.0010	715	0.0161	386	0.0000	534	0.0004	499
1325	vtcc-002	0.0000	922	0.0019	923	0.0334	674	0.0002	877	-	1131
1326	vtcc-003	0.0000	817	0.0011	786	0.0218	514	0.0001	574	-	1251
1327	vts-000	0.0000	901	0.0011	774	-	1353	0.0001	756	0.0004	751
1328	vts-001	0.0000	195	0.0003	290	0.0073	210	0.0000	349	0.0003	294
1329	vts-002	0.0000	268	0.0008	634	0.0150	352	0.0000	355	-	1122
1330	wicket-000	0.0000	633	0.0009	647	0.0260	599	0.0000	387	0.0004	556
1331	winsense-000	0.0000	458	0.0000	159	-	950	0.0000	247	0.0000	89
1332	winsense-001	0.0000	231	0.0000	43	-	1204	0.0000	131	0.0000	220
1333	winsense-002	0.0000	108	0.0000	106	-	1358	0.0000	52	0.0000	154
1334	wiseai-001	0.0001	1104	0.0137	1155	0.0768	804	0.0018	1193	0.0018	1018

Table 107: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

	Algorithm	Failure to Enrol Rate[1]									
	Name	APPLICATION		BORDER		KIOSK		MUGSHOT		VISA	
	Name	SEC. 2.2		SEC. 2.4		SEC. 2.6		SEC. 2.5		SEC. 2.1	
1335	wuhantianyu-001	0.0000	168	0.0007	536	0.0159	376	0.0001	567	0.0004	630
1336	x-laboratory-000	0.0247	1211	0.0000	3	-	1106	0.0005	1075	0.0002	276
1337	x-laboratory-001	0.0000	726	0.0012	798	-	873	0.0001	711	0.0004	726
1338	xforwardai-000	0.0000	92	0.0000	99	-	1305	0.0000	66	0.0000	163
1339	xforwardai-001	0.0000	559	0.0007	556	-	1109	0.0003	936	0.0004	717
1340	xforwardai-002	0.0000	627	0.0007	558	-	1187	0.0003	937	0.0004	718
1341	xm-000	0.0000	401	0.0007	529	-	893	0.0001	576	0.0003	329
1342	yisheng-000	-	1343	-	1300	-	861	-	1361	0.0006	878
1343	yisheng-001	-	1339	-	1304	-	870	-	1358	0.0006	877
1344	yisheng-002	-	1301	-	1336	-	1006	-	1335	0.0006	876
1345	yisheng-004	0.0002	1145	-	1334	-	994	0.0013	1167	0.0006	895
1346	yitu-000	-	1266	-	1225	-	1101	-	1313	0.0013	999
1347	yitu-001	-	1361	-	1324	-	959	0.0009	1139	0.0006	897
1348	yitu-002	-	1241	-	1276	-	1320	-	1300	0.0000	170
1349	yitu-003	0.0000	259	0.0000	179	-	998	0.0009	1137	0.0000	27
1350	yoonik-000	0.0000	704	0.0019	927	-	1081	0.0001	647	0.0004	722
1351	yoonik-001	0.0000	110	0.0014	860	-	1354	0.0001	745	0.0004	713
1352	yoonik-002	0.0000	830	0.0010	739	0.0284	619	0.0003	917	0.0006	871
1353	yoonik-003	0.0000	840	0.0009	684	0.0214	505	0.0002	789	0.0004	671
1354	yoonik-004	0.0000	442	0.0012	790	0.0251	584	0.0001	613	0.0004	484
1355	yoti-001	0.0000	842	0.0014	861	0.0418	724	0.0008	1135	0.0006	884
1356	yoti-002	0.0000	257	0.0007	526	0.0171	400	0.0001	668	-	1119
1357	ytu-000	0.0000	546	0.0010	760	-	1346	0.0002	882	0.0004	712
1358	yuan-000	0.0000	301	0.0000	190	-	1026	0.0000	157	0.0000	13
1359	yuan-001	0.0000	986	0.0010	753	-	1297	0.0005	1071	0.0005	826
1360	yuan-002	0.0000	997	0.0010	754	0.0284	617	0.0005	1074	0.0005	825
1361	yuan-003	0.0000	988	0.0010	752	0.0284	618	0.0005	1072	0.0005	827
1362	yuan-004	0.0000	406	0.0000	135	0.0000	14	0.0000	211	0.0000	63
1363	yuan-005	0.0000	673	0.0005	428	0.0134	321	0.0002	820	0.0004	500
1364	yuan-006	0.0000	1019	0.0014	863	0.0369	698	0.0004	1003	0.0005	837
1365	yuan-007	0.0000	1013	0.0013	824	0.0336	679	0.0004	1000	0.0005	841
1366	yuan-008	0.0000	1012	0.0013	823	0.0336	678	0.0004	1001	0.0005	843
1367	yuan-009	0.0000	1018	0.0013	826	0.0336	677	0.0004	1002	-	1102
1368	yuan-010	0.0000	1025	0.0013	825	0.0336	676	0.0004	1004	-	1199

Table 108: FTE is the proportion of failed template generation attempts. Failures can occur because the software throws an exception, or because the software electively refuses to process the input image. This would typically occur if a face is not detected. FTE is measured as the number of function calls that give EITHER a non-zero error code OR that give a "small" template. This is defined as one whose size is less than 0.3 times the median template size for that algorithm. This second rule is needed because some algorithms incorrectly fail to return a non-zero error code when template generation fails.
A hyphen "-" indicates the dataset was not produced. [1]*The effects of FTE are included in the accuracy results of this report by regarding any template comparison involving a failed template to produce a low similarity score. Thus higher FTE results in higher FNMR and lower FMR.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.4 Recognition accuracy

Core algorithm accuracy is stated via:

- ▷ **Cooperative subjects**
  - The summary table of Figure 84;
  - The visa image DETs of Figure 214;
  - The mugshot DETs of Figure 278;
  - The mugshot ageing profiles of Figure 767;
  - The human-difficult pairs of Figure 104
- ▷ **Non-cooperative subjects**
  - The photojournalism DET of Figure 314

Figure 597 shows dependence of false match rate on algorithm score threshold. This allows a deployer to set a threshold to target a particular false match rate appropriate to the security objectives of the application.

Figure 596 likewise shows FMR(T) but for mugshots, and specially four subsets of the population.

Note that in both the mugshot and visa sets false match rates vary with the ethnicity, age, and sex, of the enrollee and impostor. For example figure 378 summarizes FMR for impostors paired from four groups black females, black males, white females, white males.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

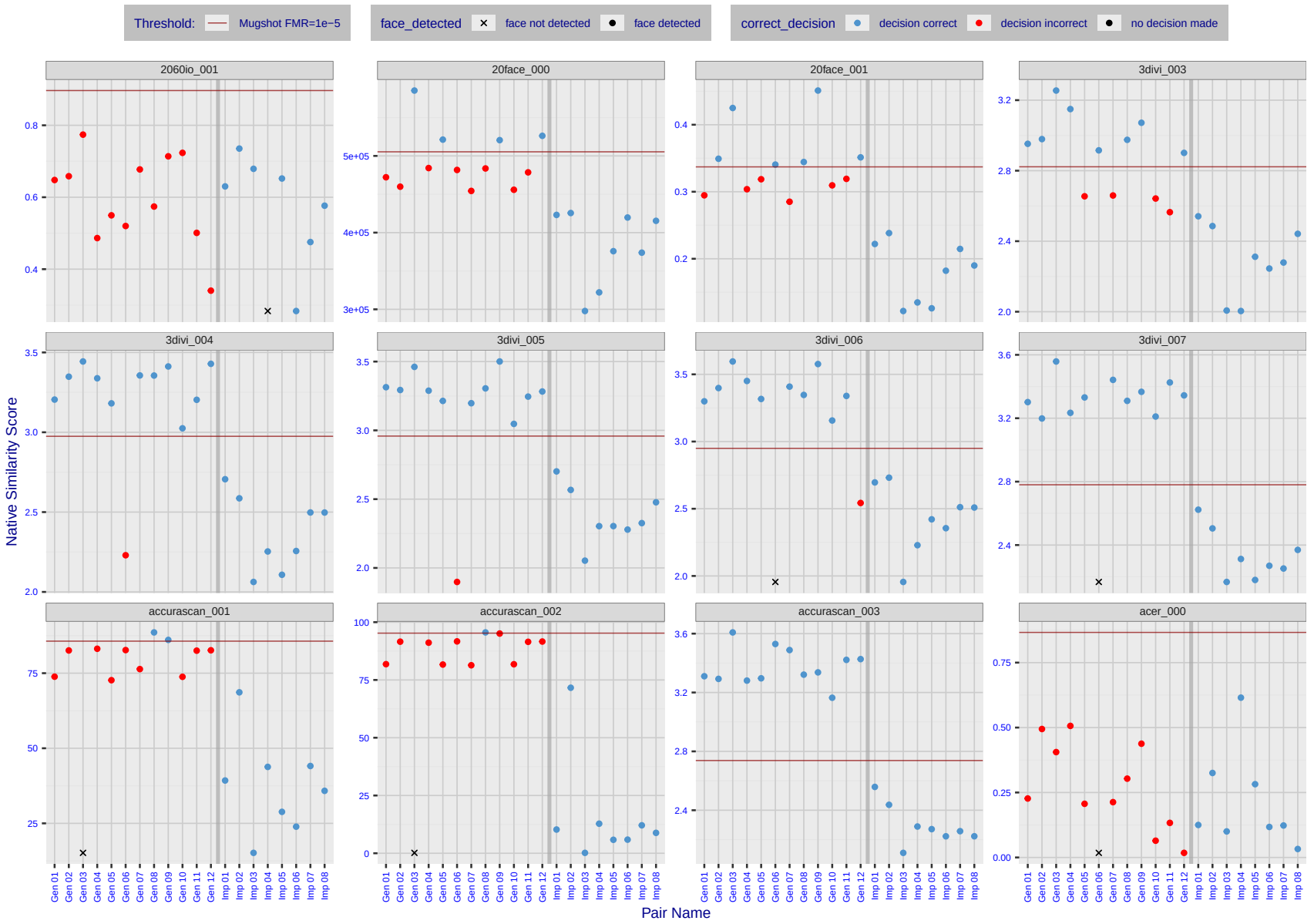


Figure 4: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. *([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.*

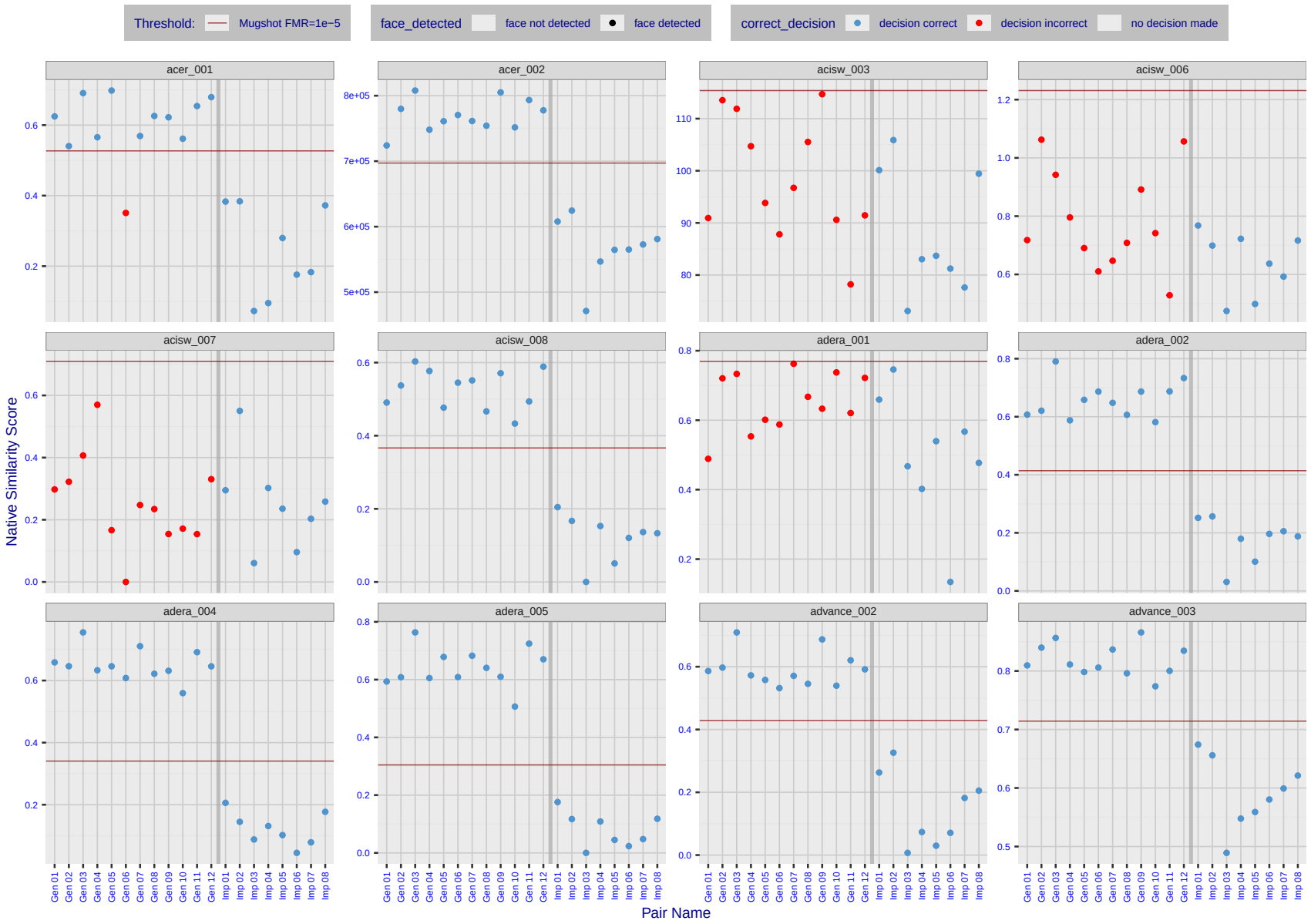


Figure 5: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

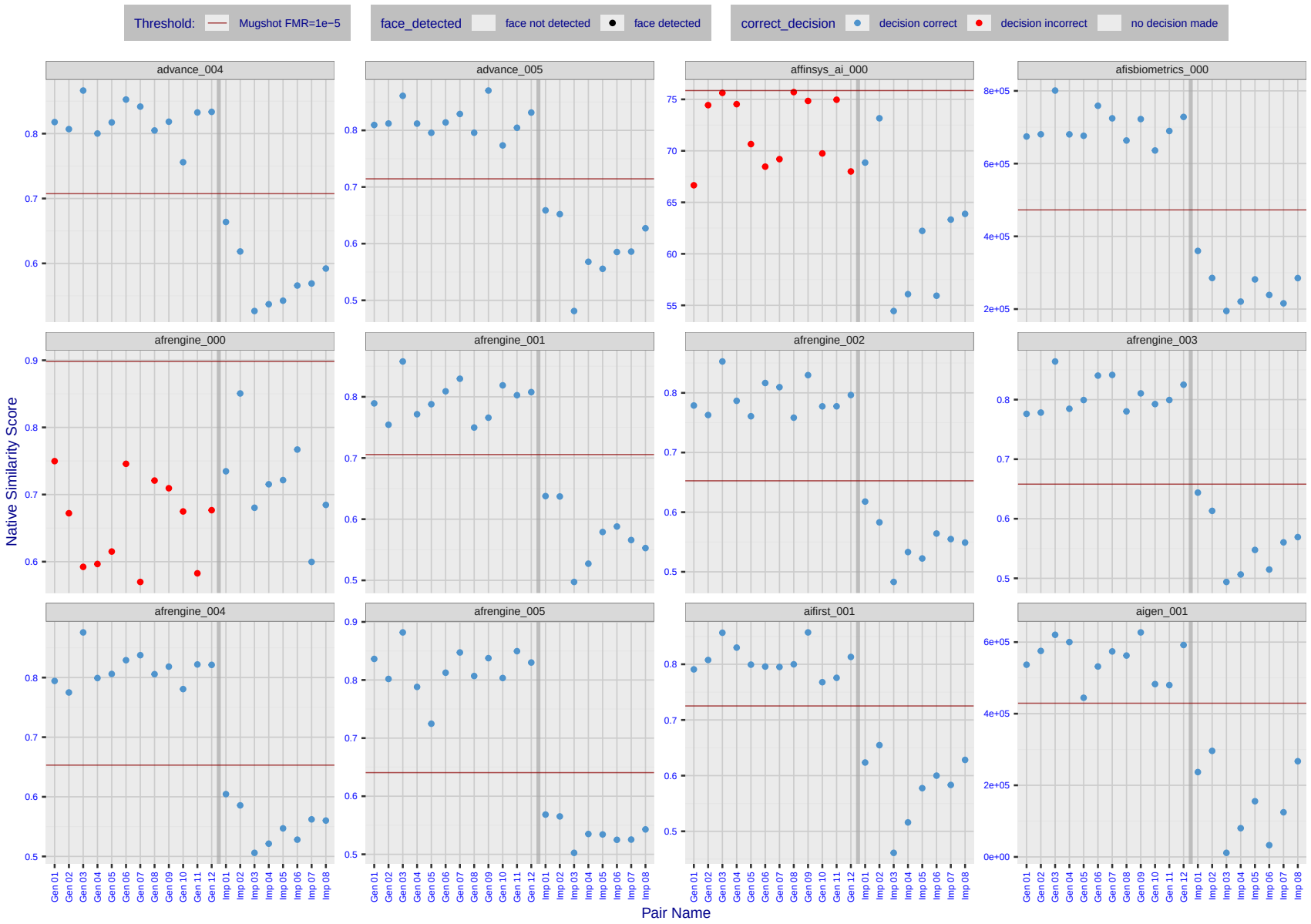


Figure 6: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

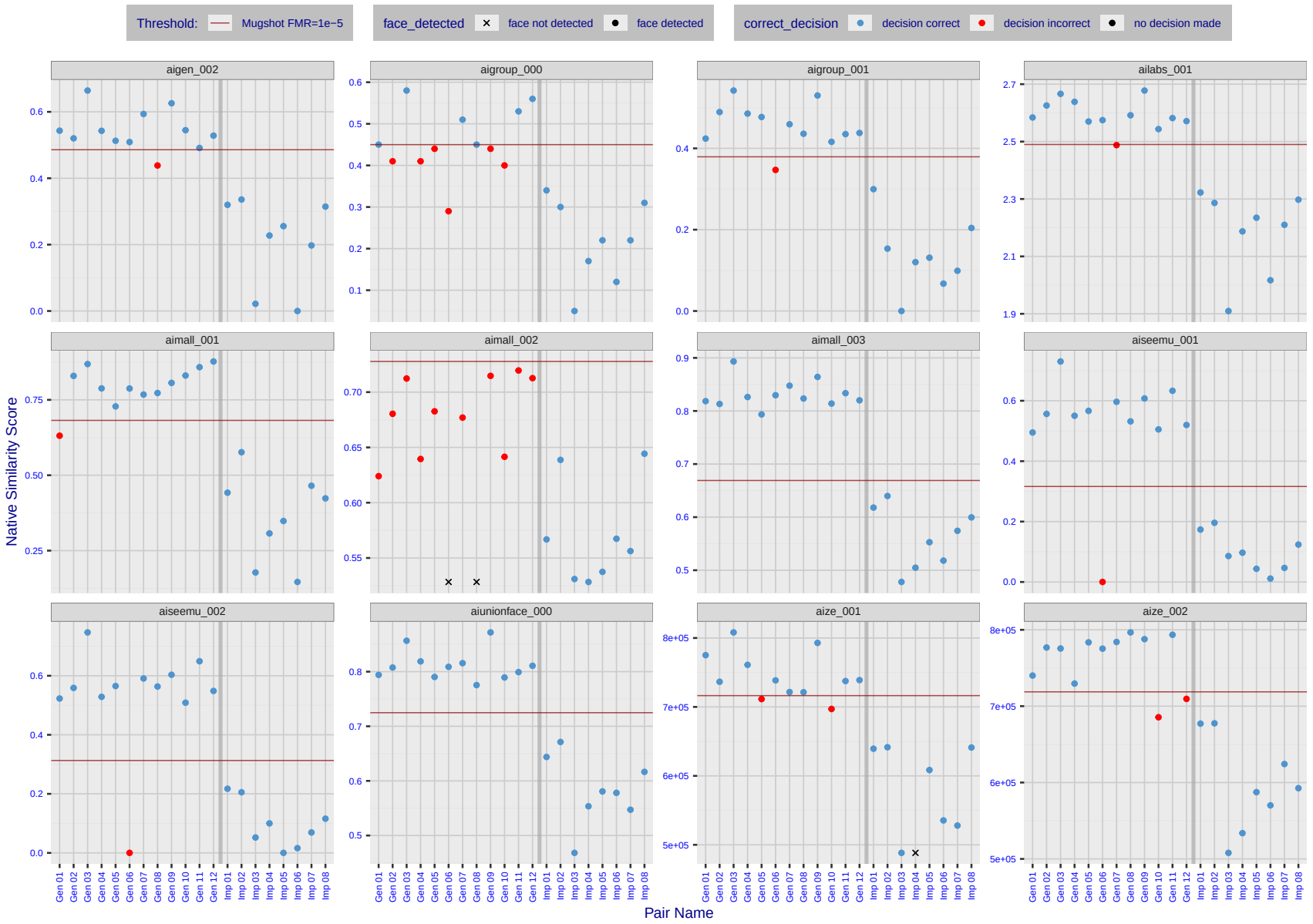


Figure 7: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

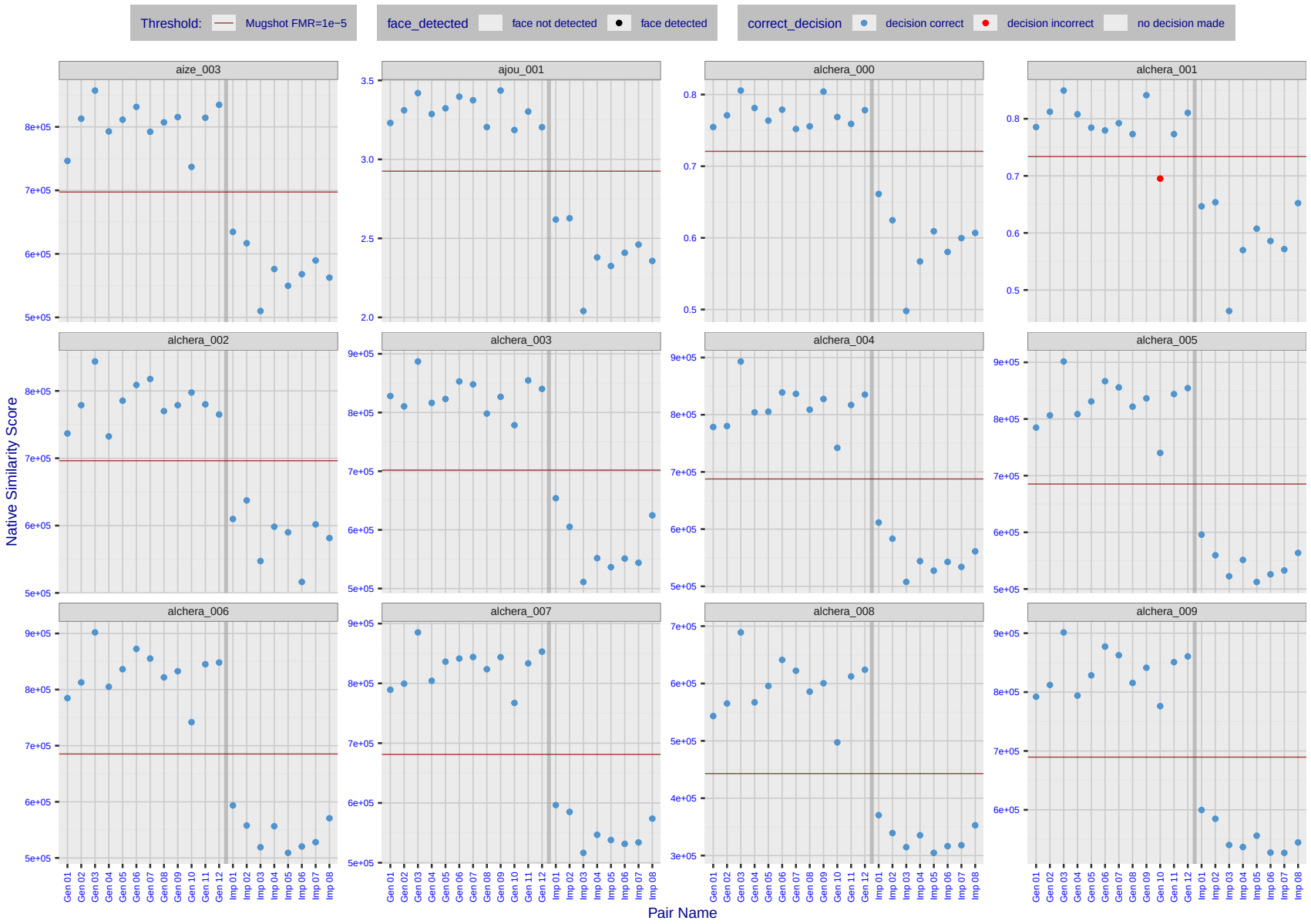


Figure 8: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

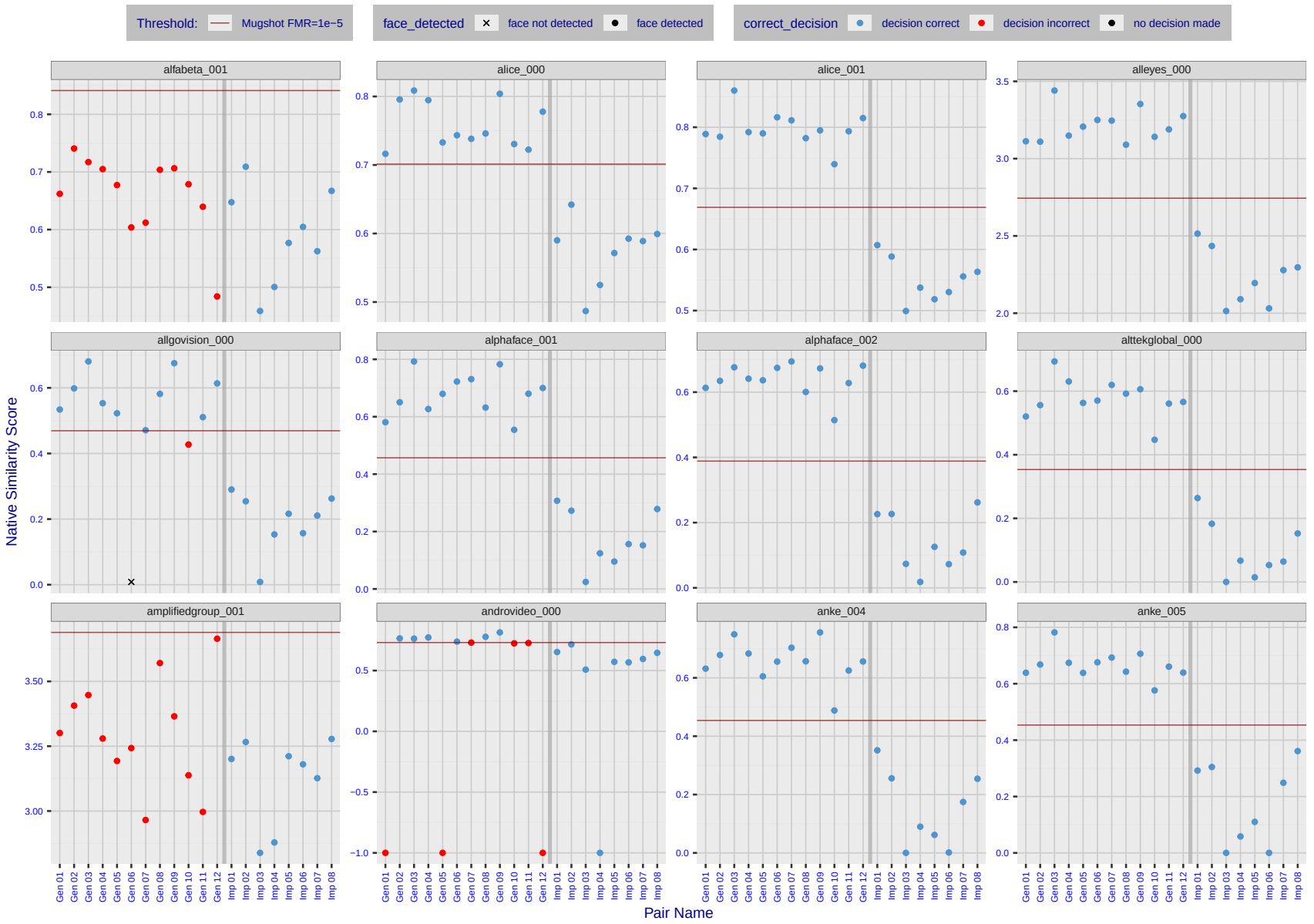


Figure 9: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

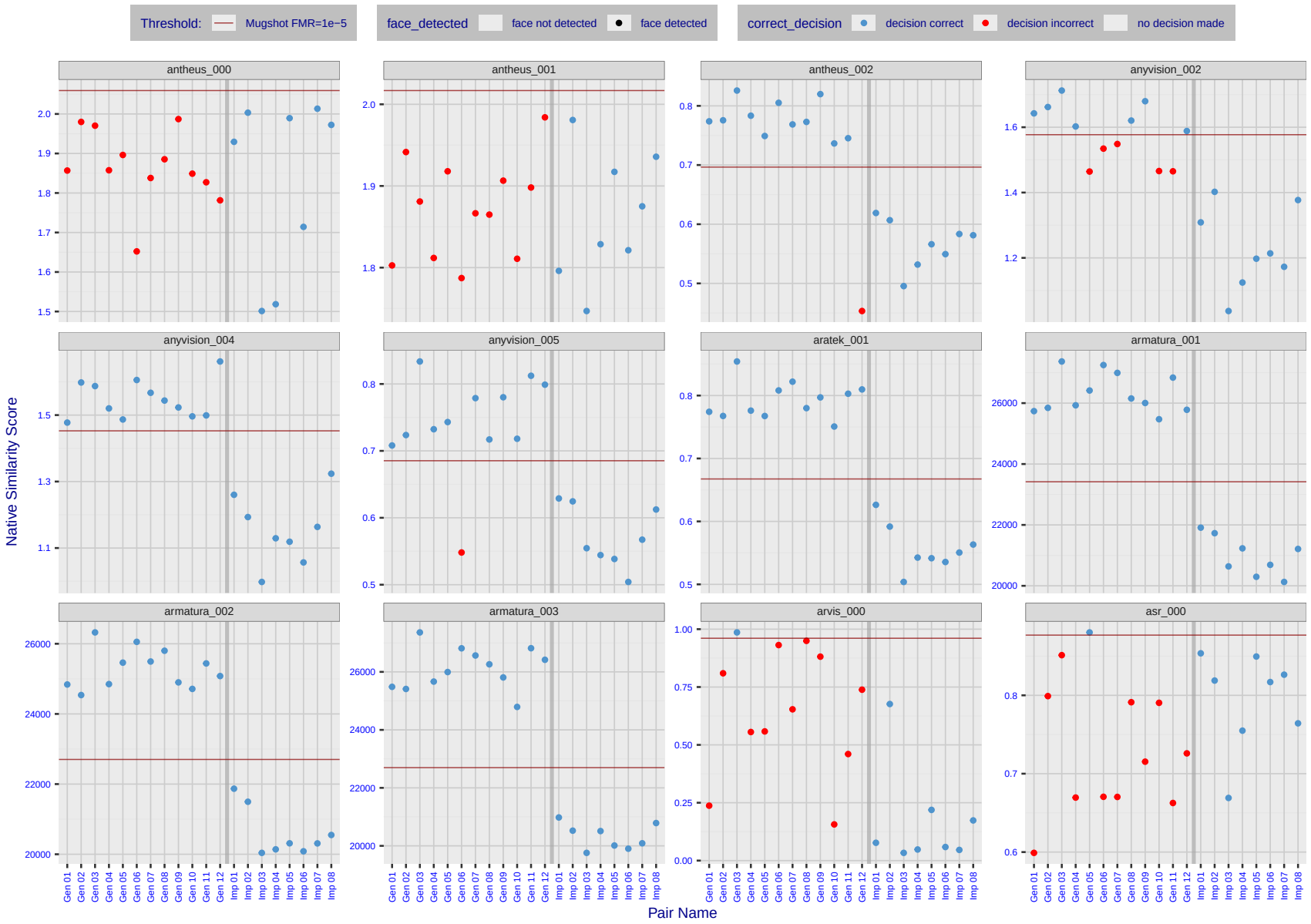


Figure 10: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

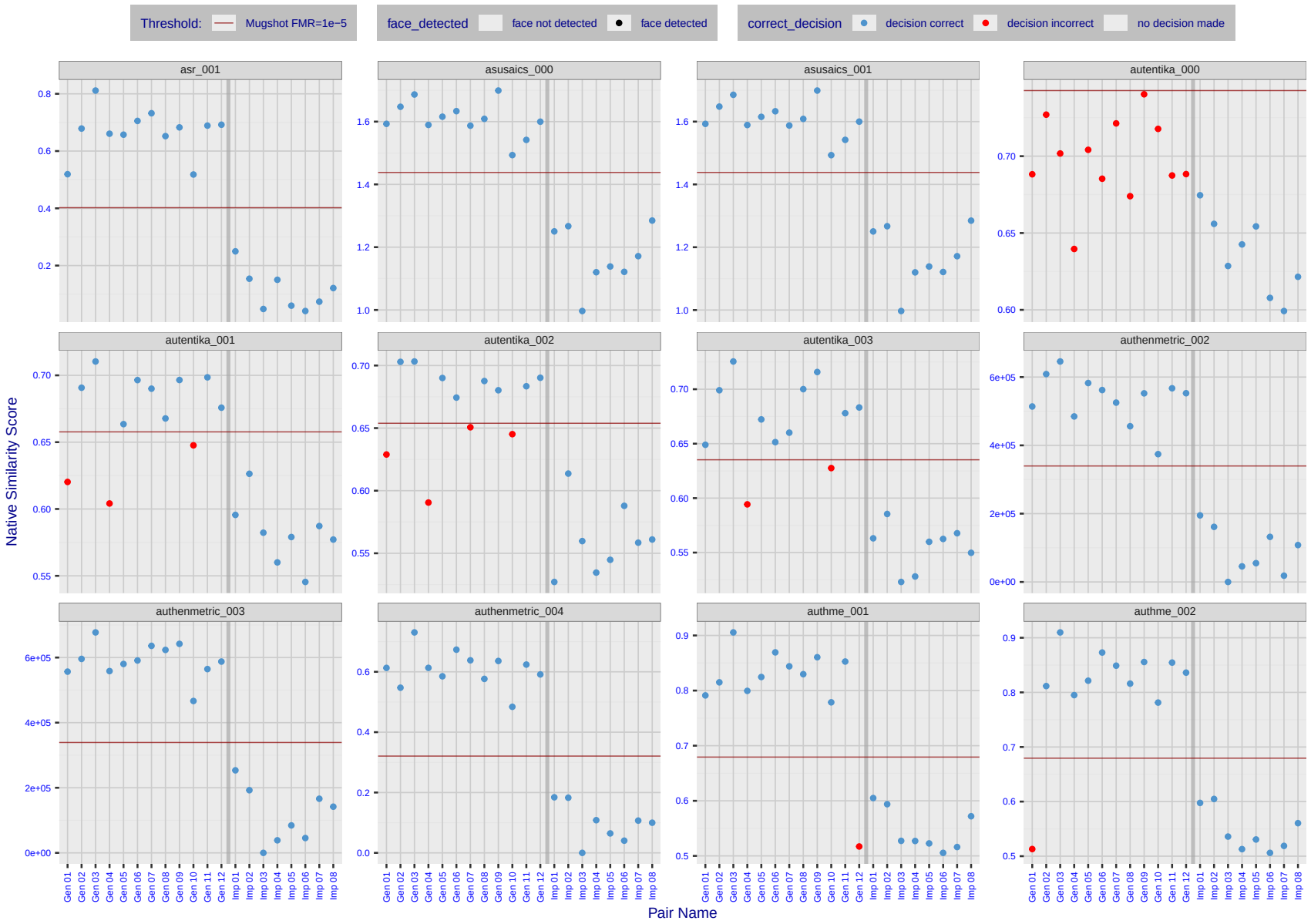


Figure 11: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

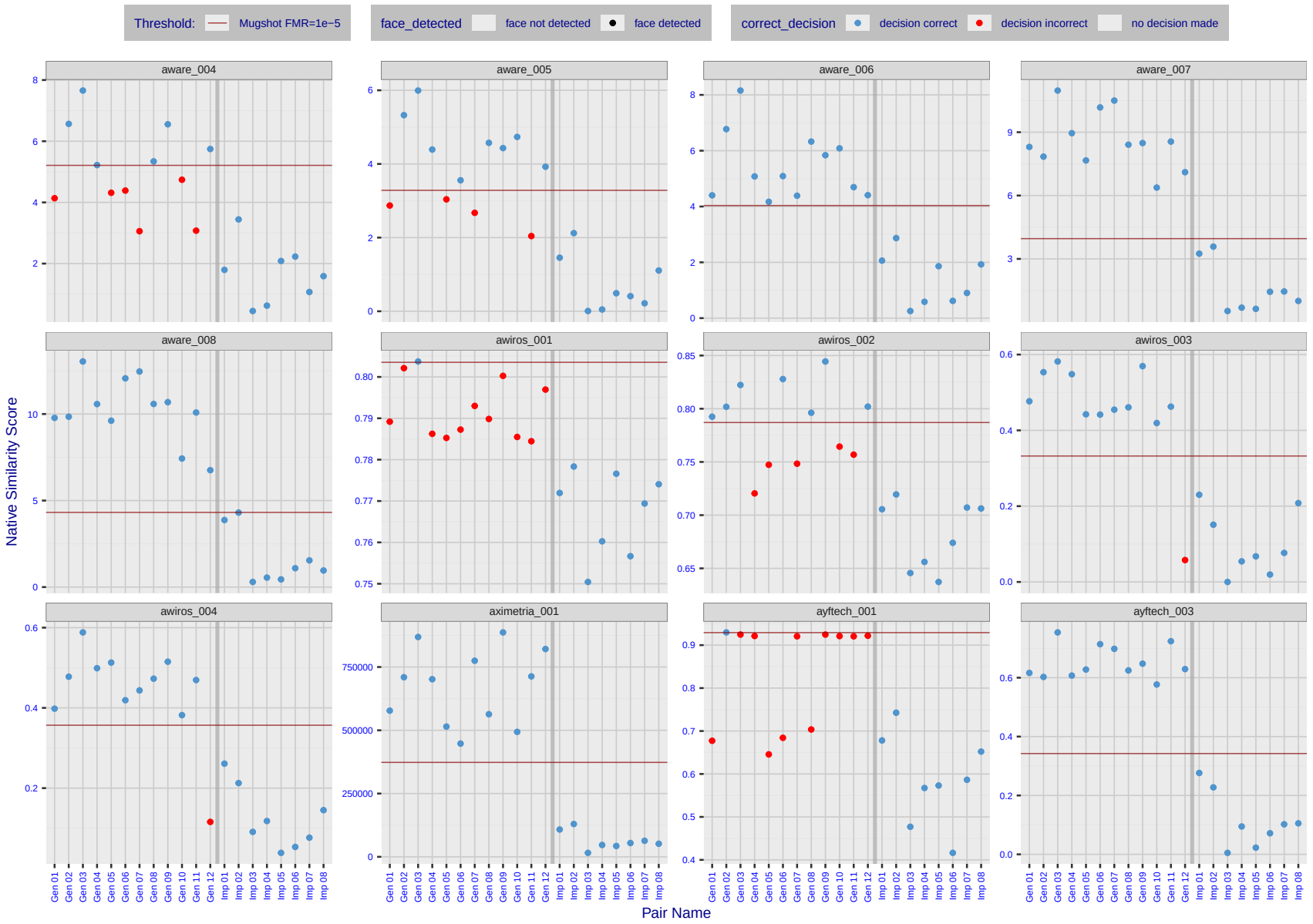


Figure 12: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

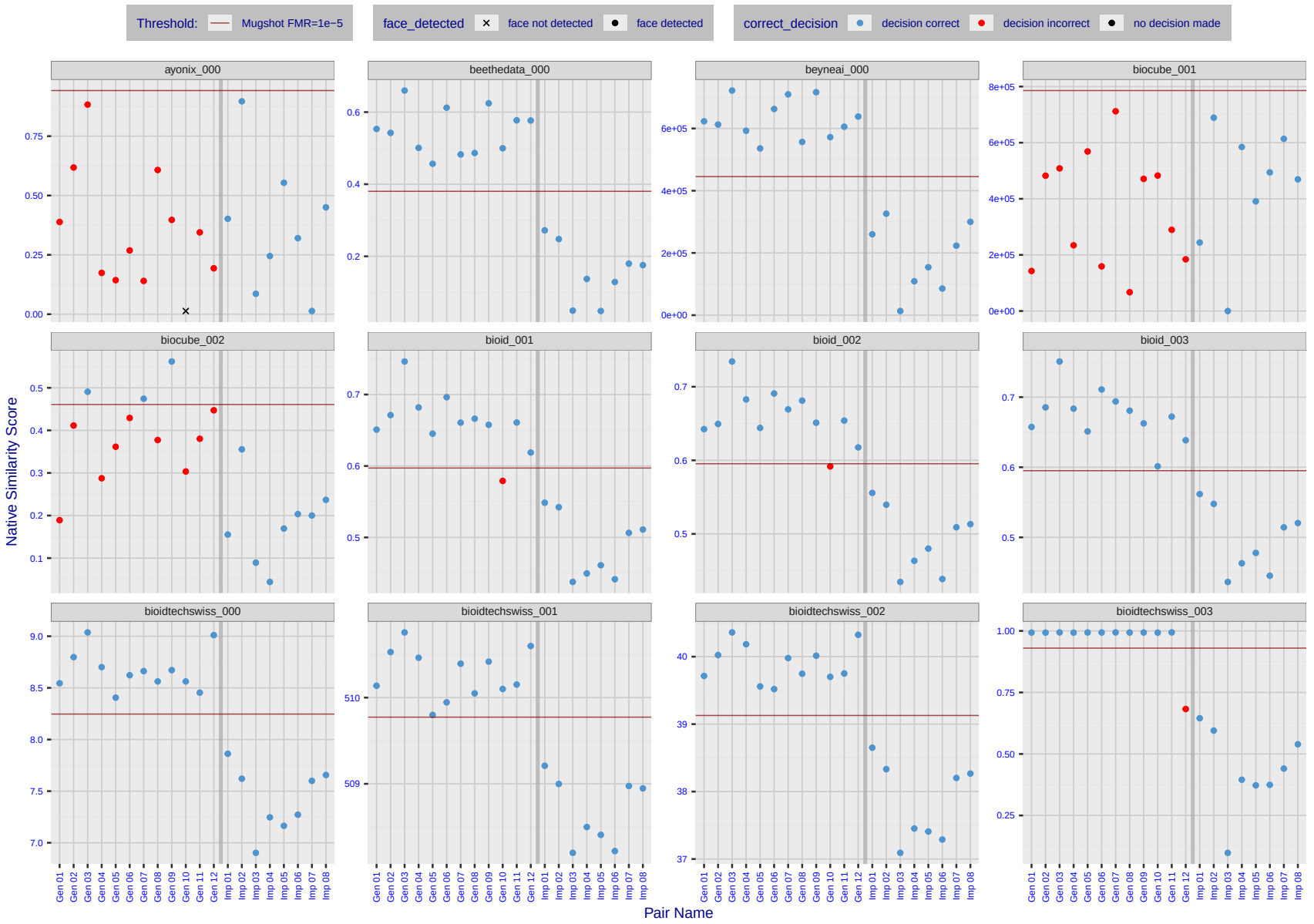

Figure 13: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

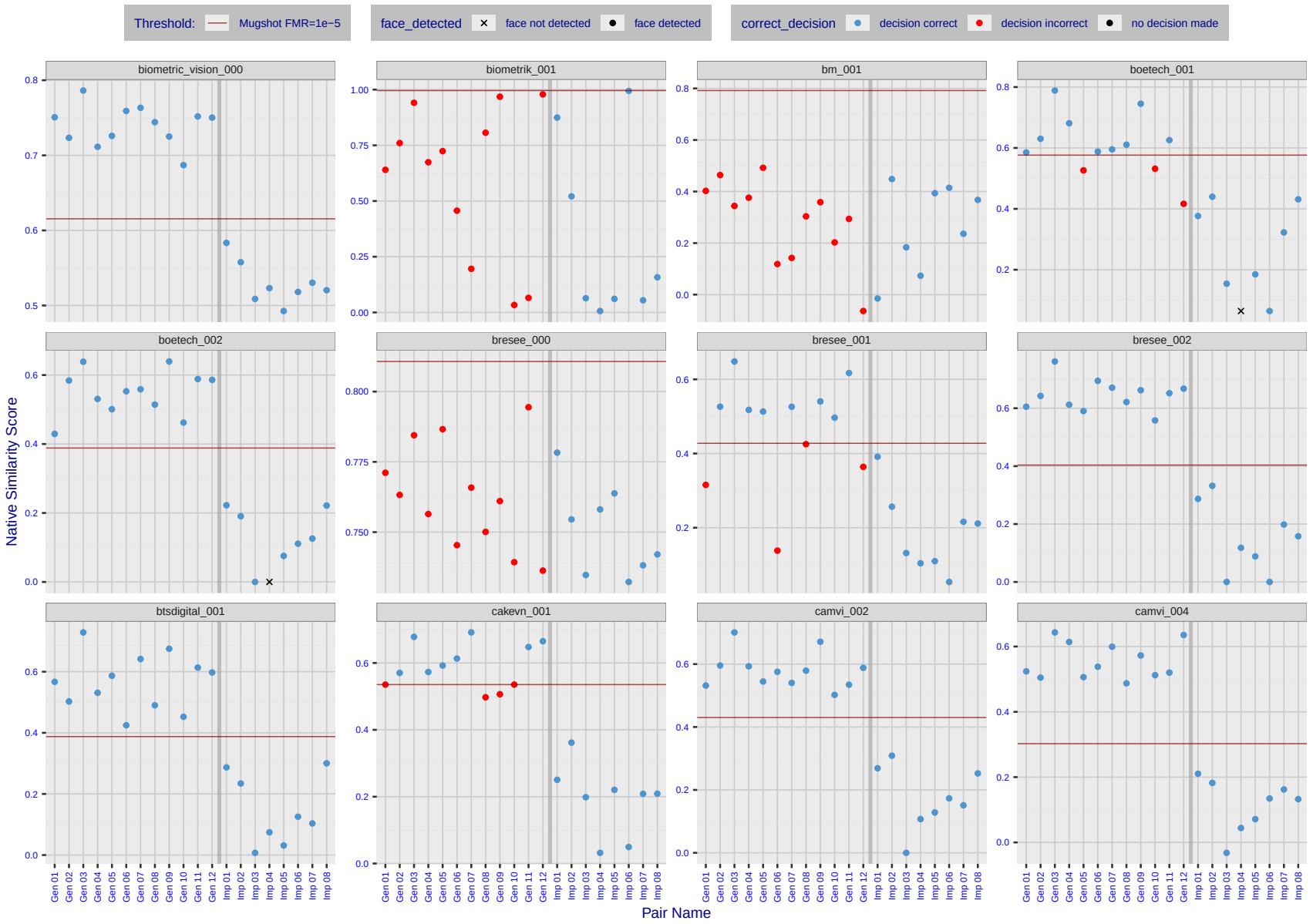

Figure 14: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

2026/01/23 11:36:01 FNMR(T) "False non-match rate"
FMR(T) "False match rate"

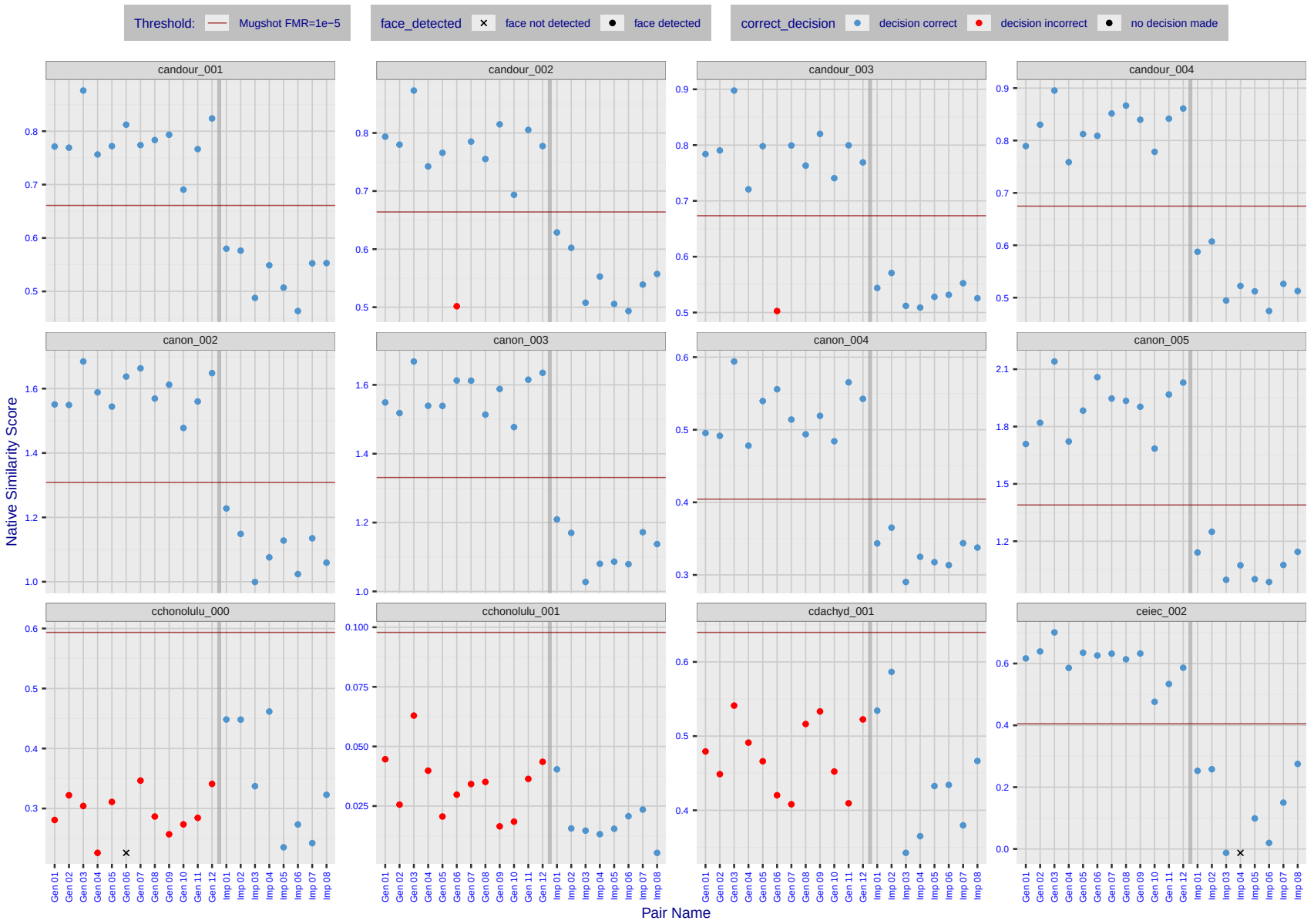

Figure 15: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

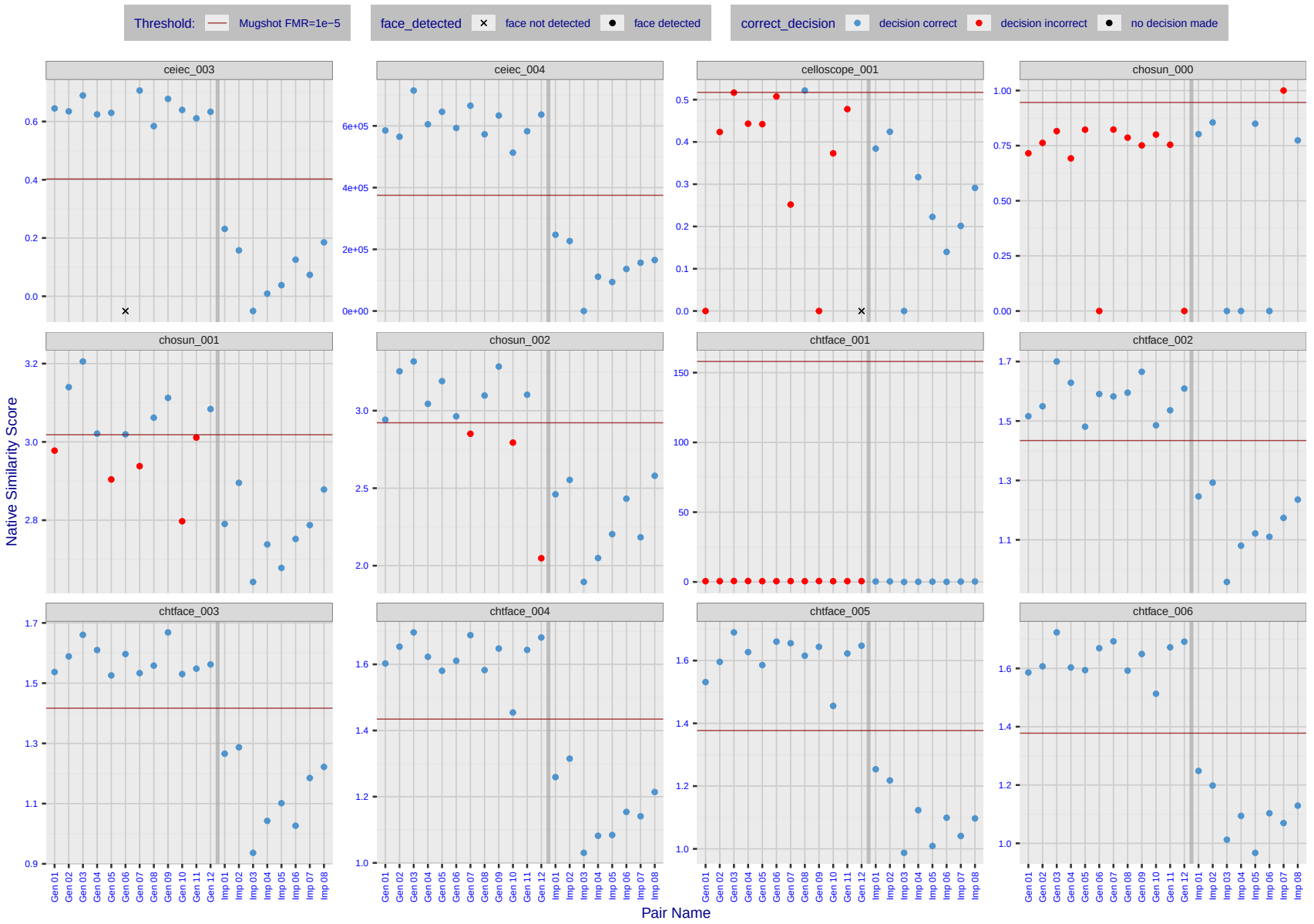

Figure 16: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

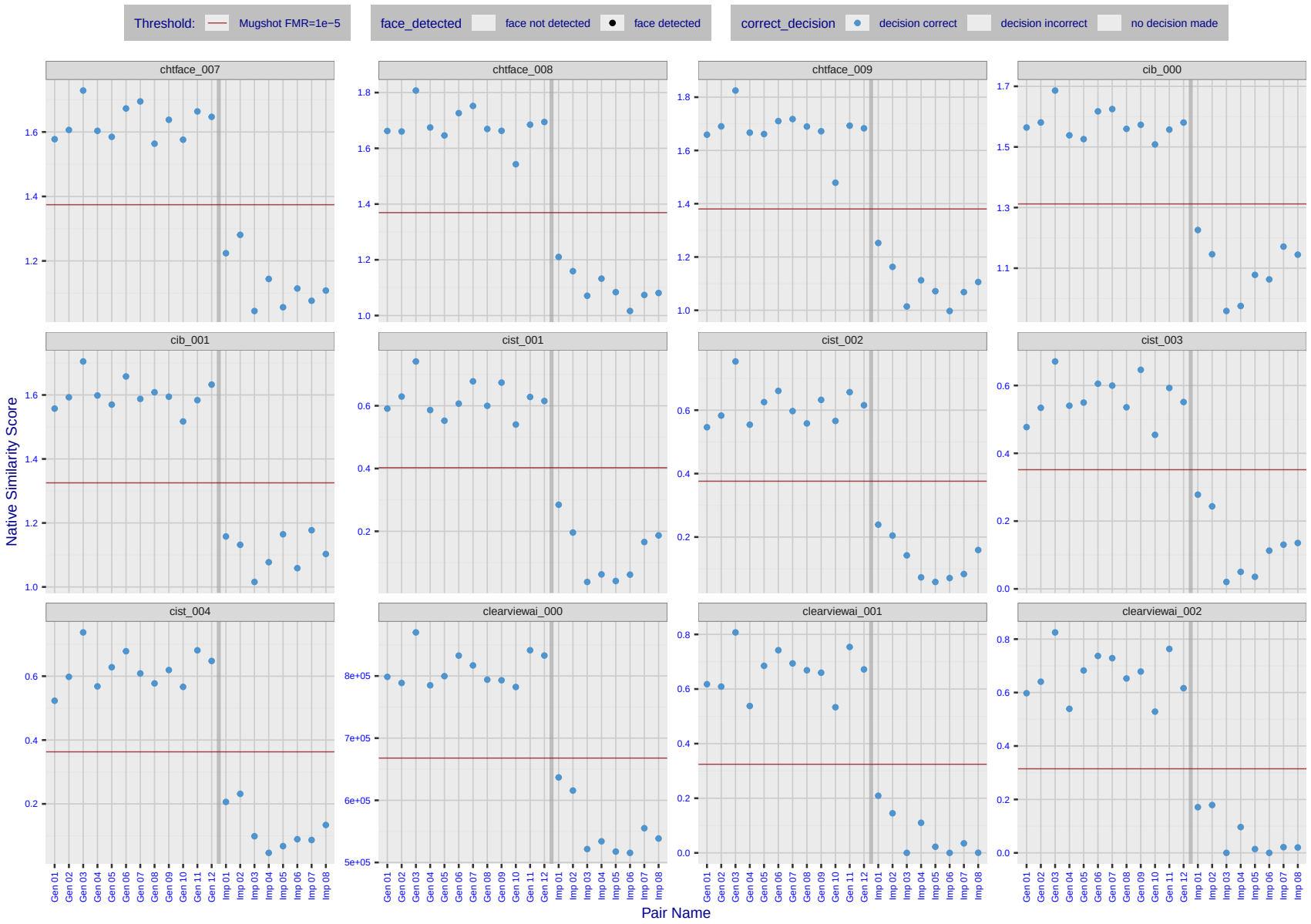

Figure 17: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

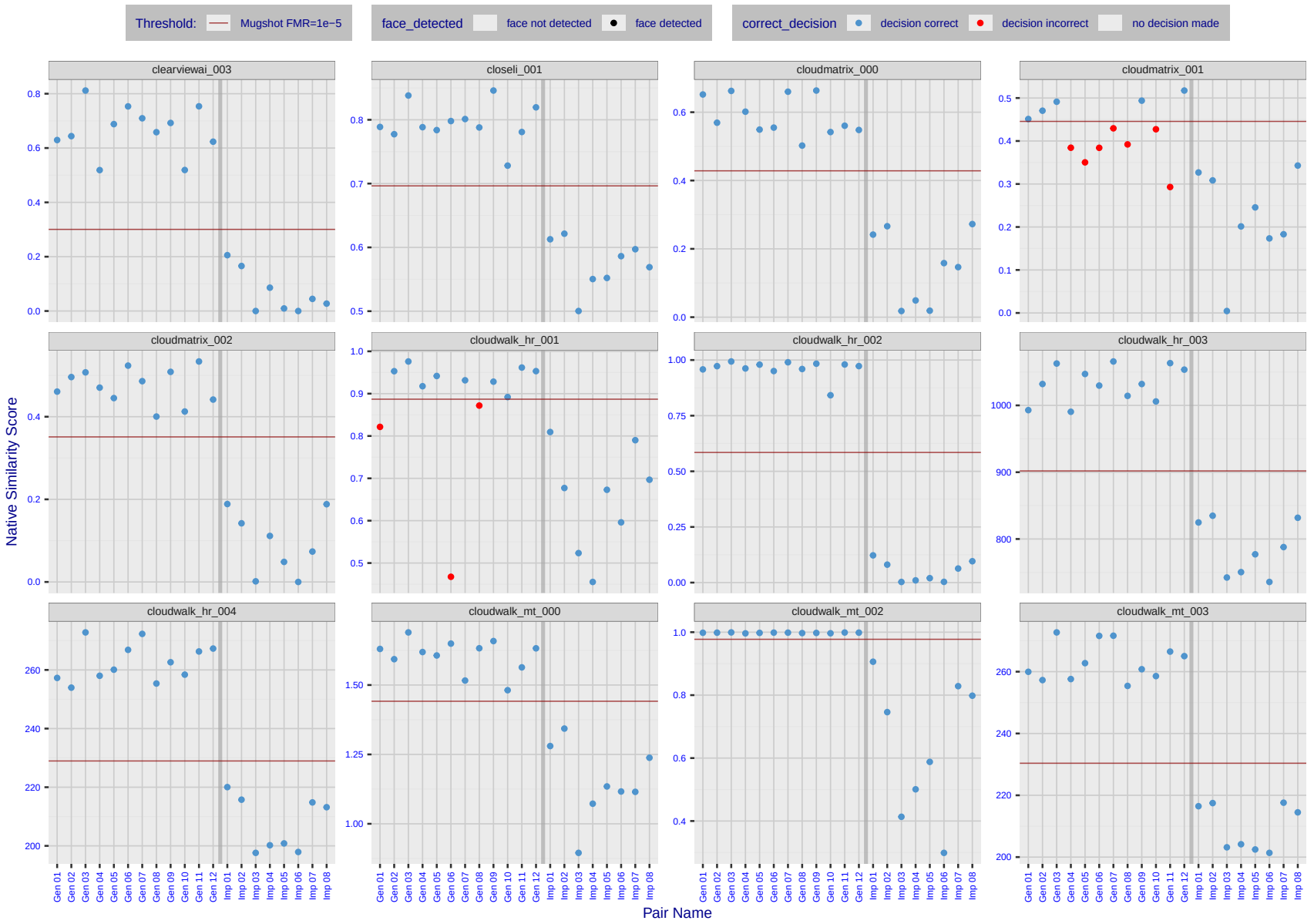

Figure 18: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

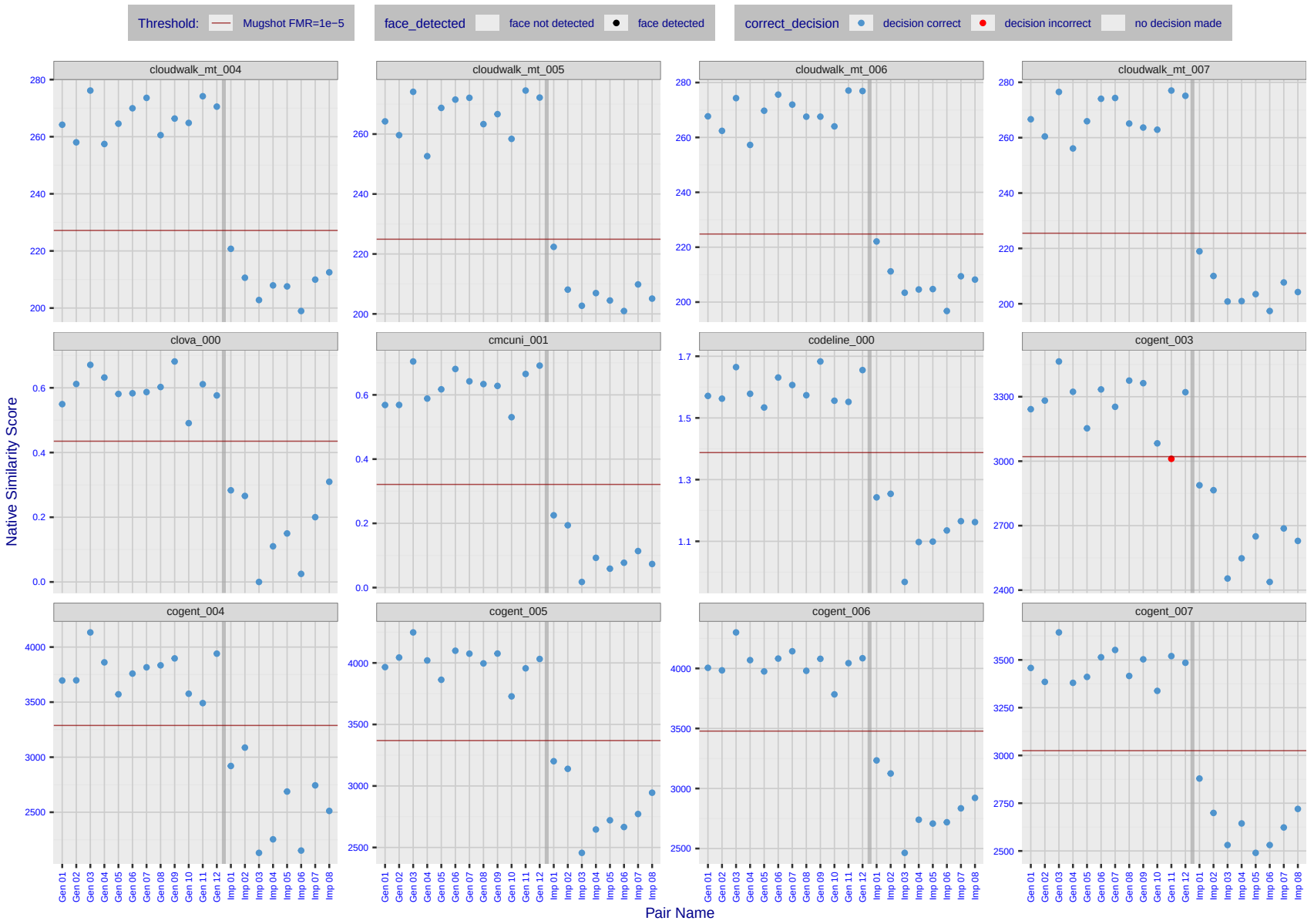

Figure 19: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

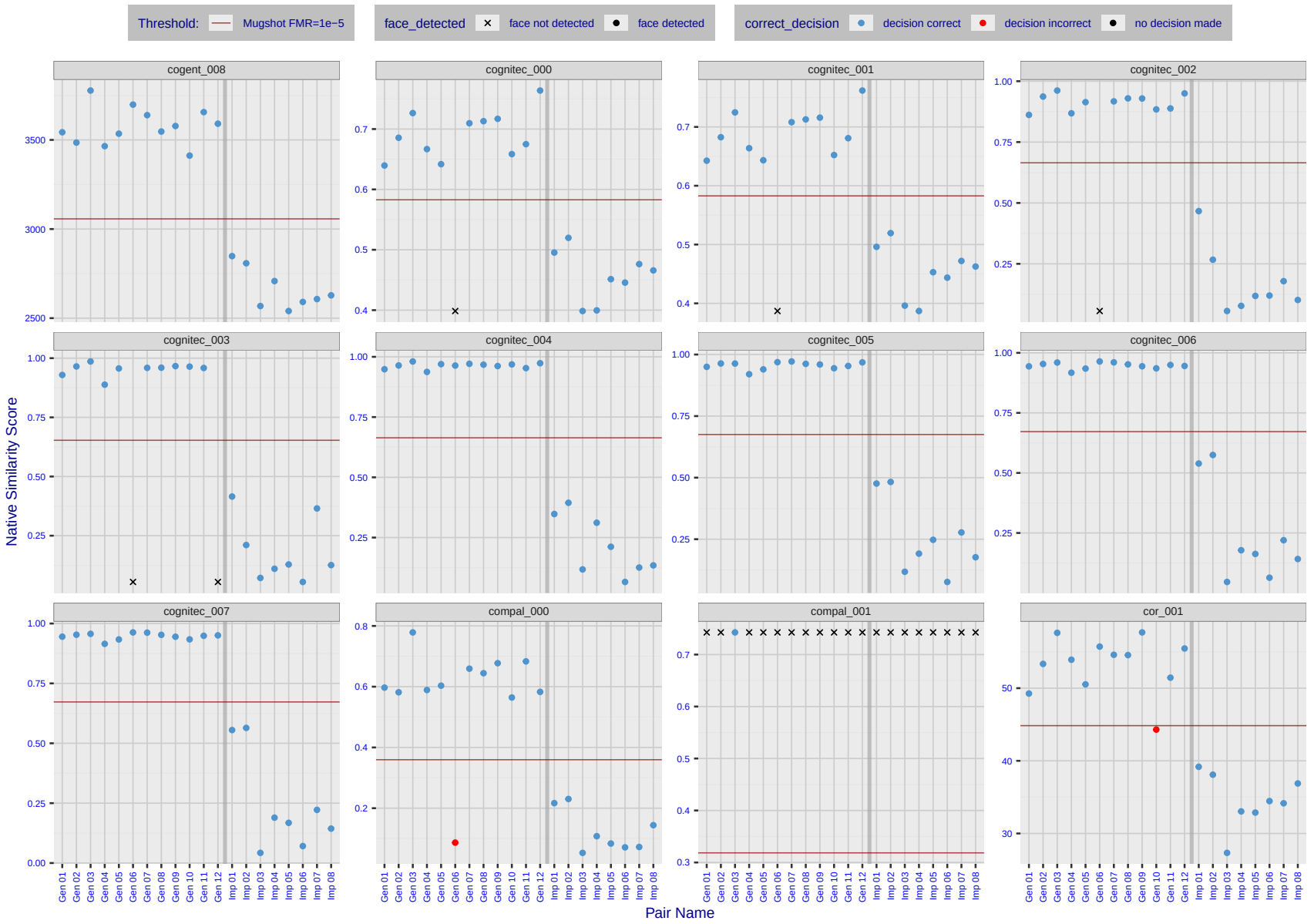

Figure 20: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

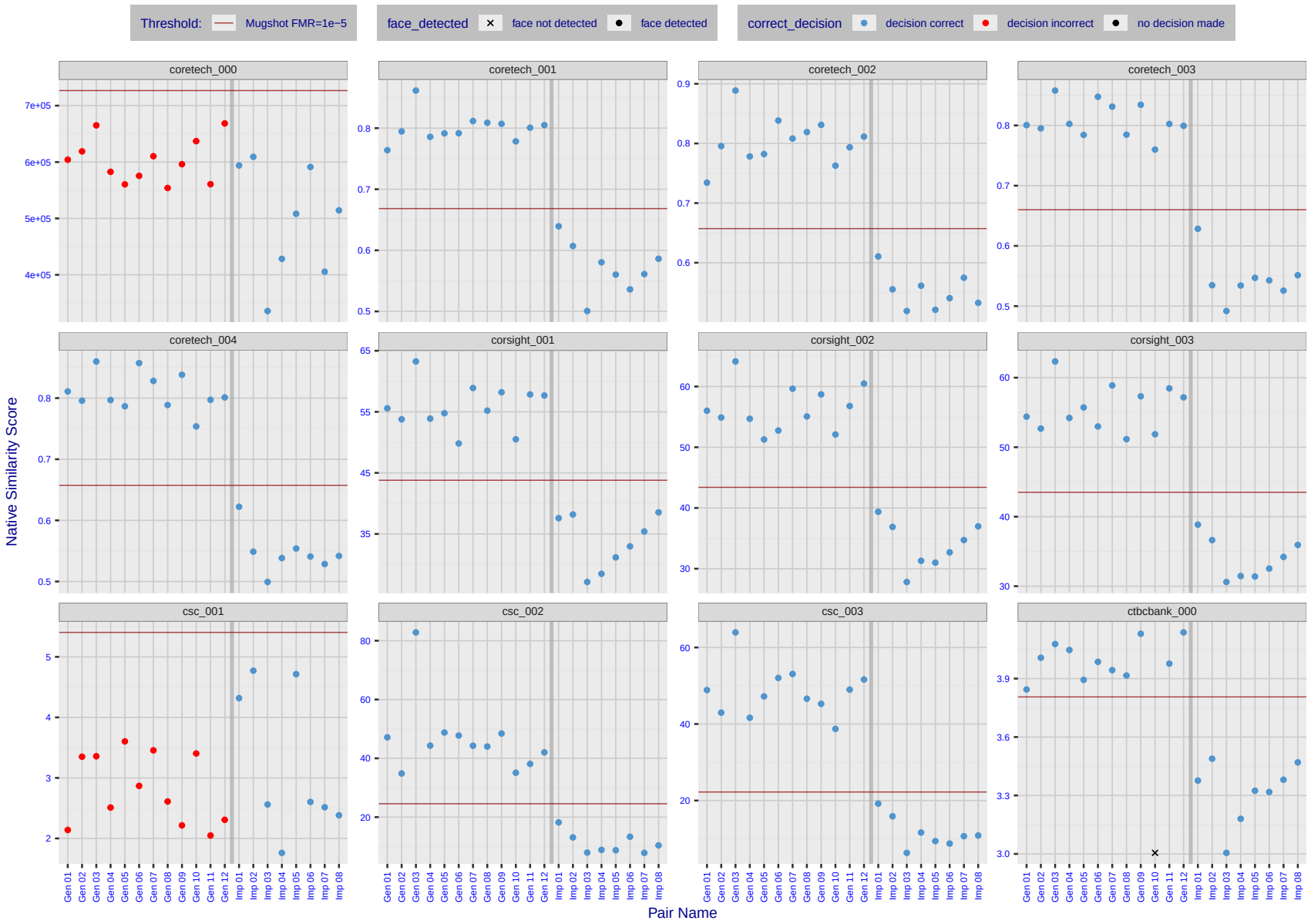

Figure 21: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

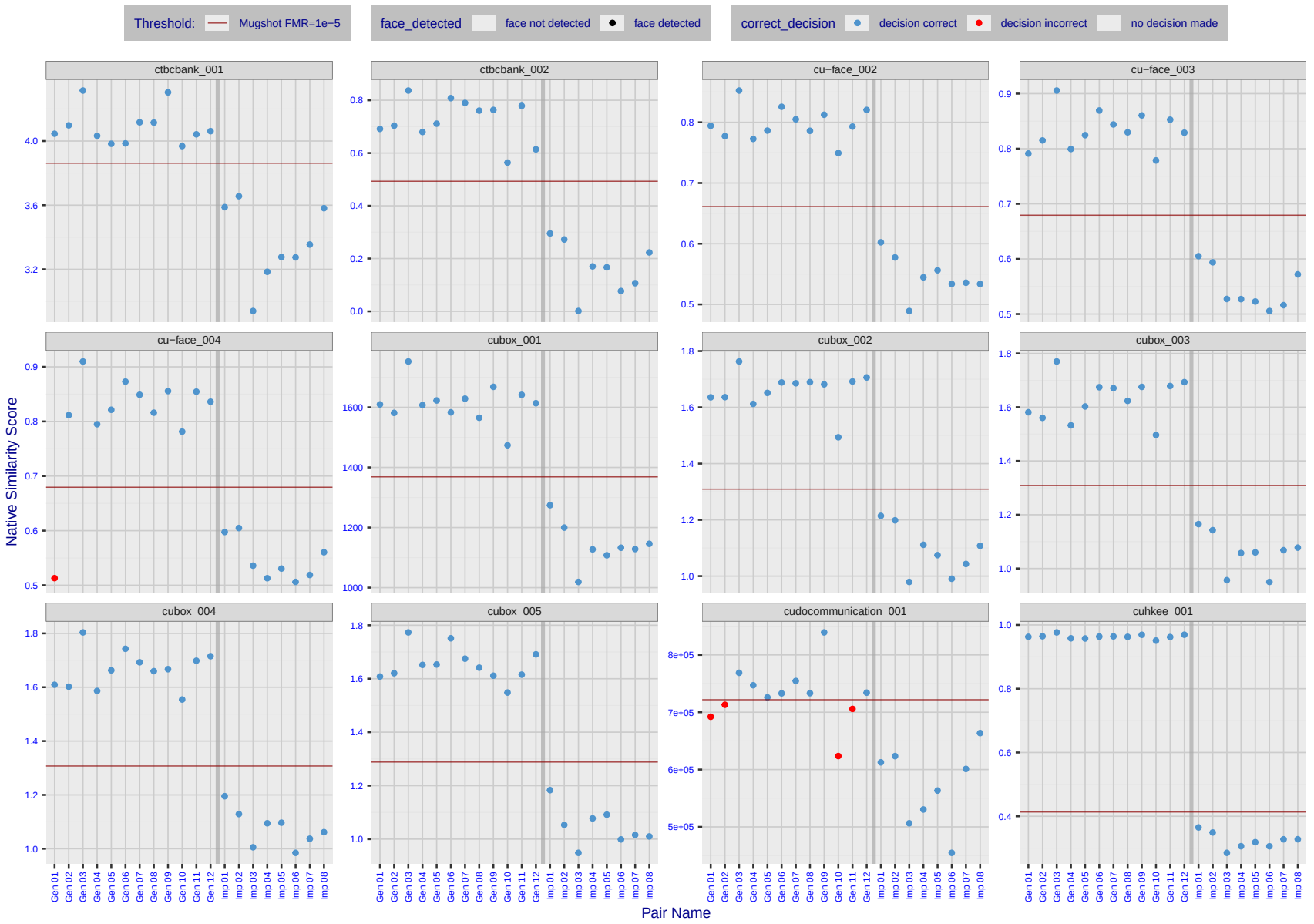

Figure 22: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

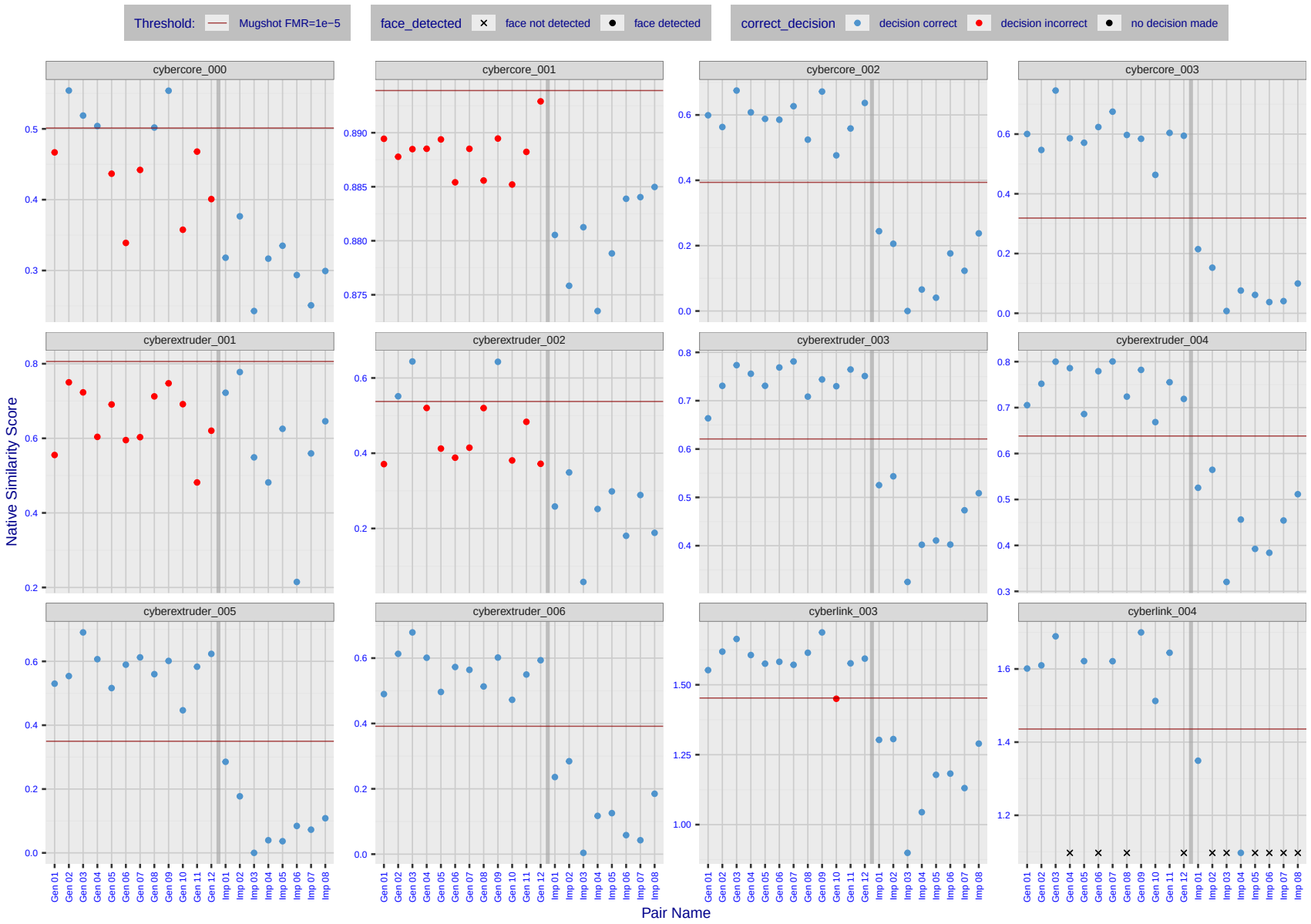

Figure 23: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

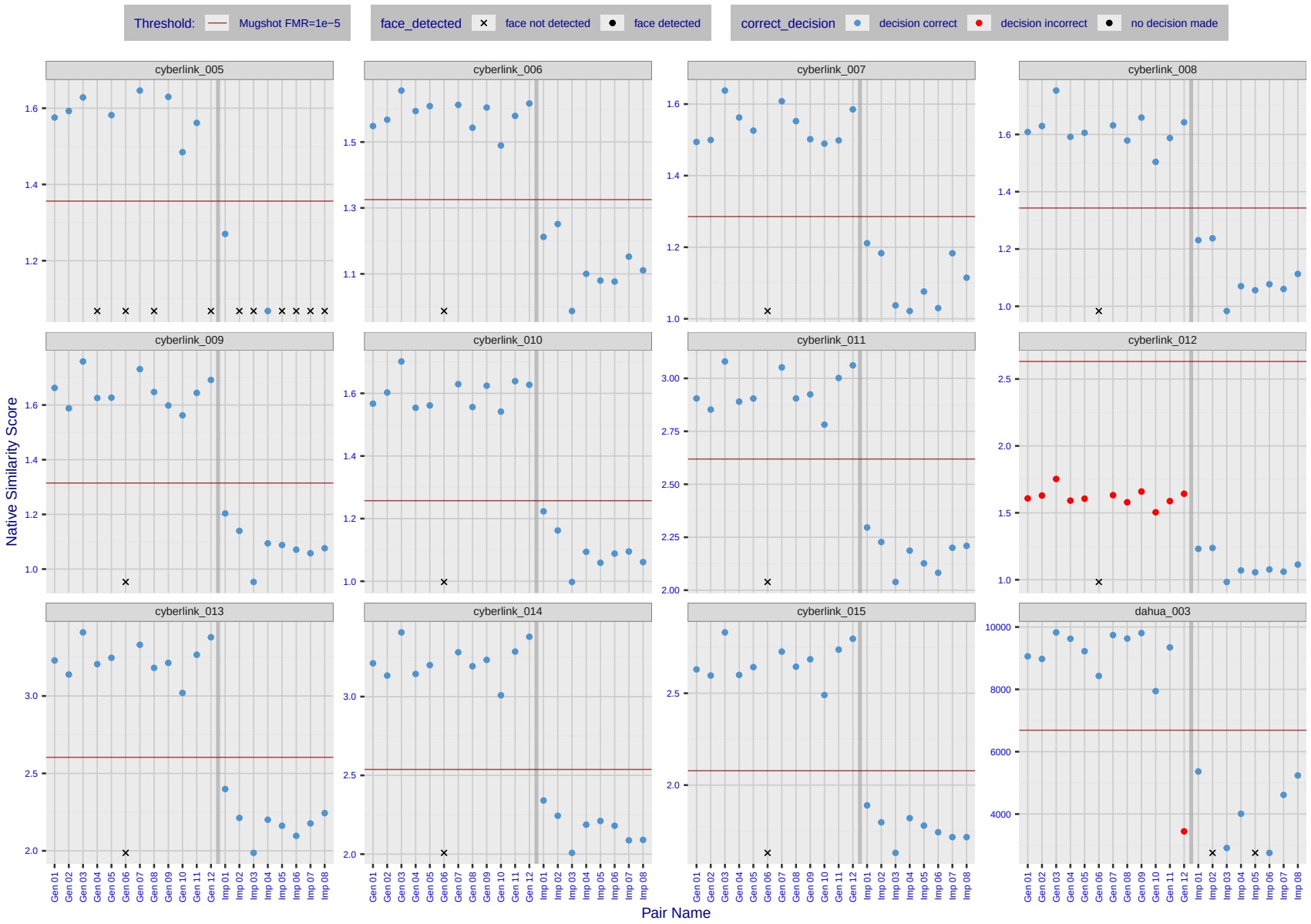

Figure 24: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

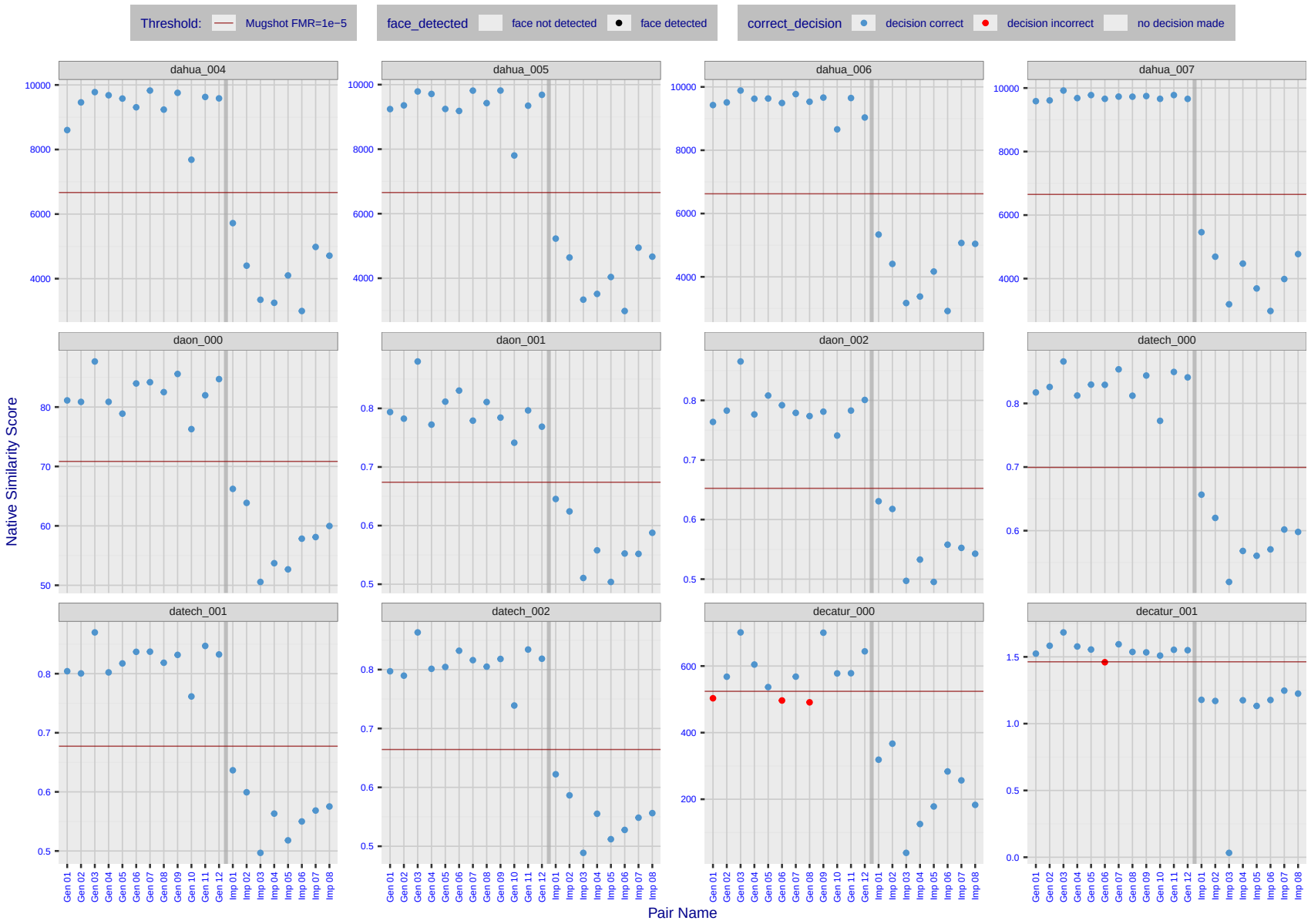

Figure 25: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

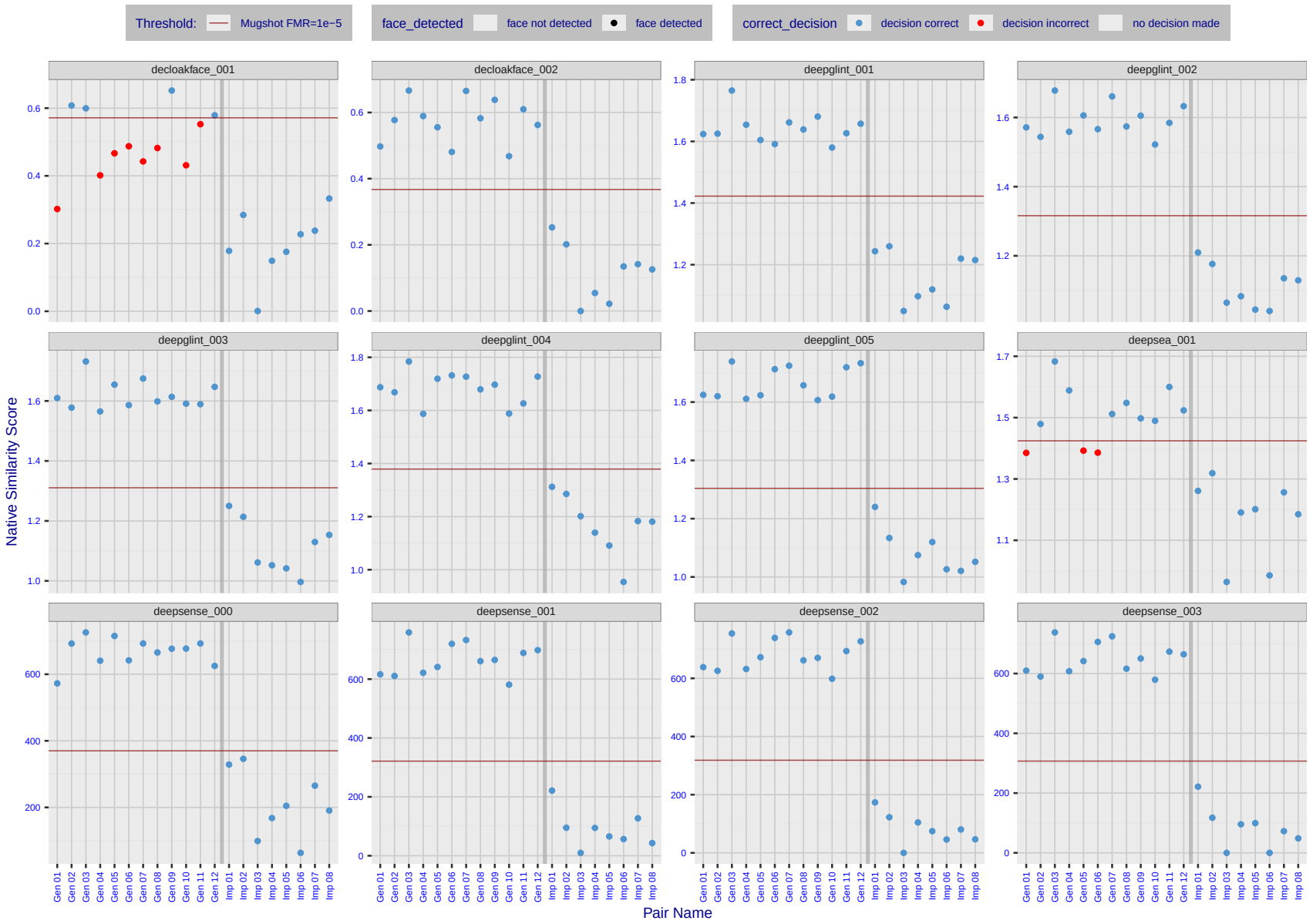

Figure 26: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

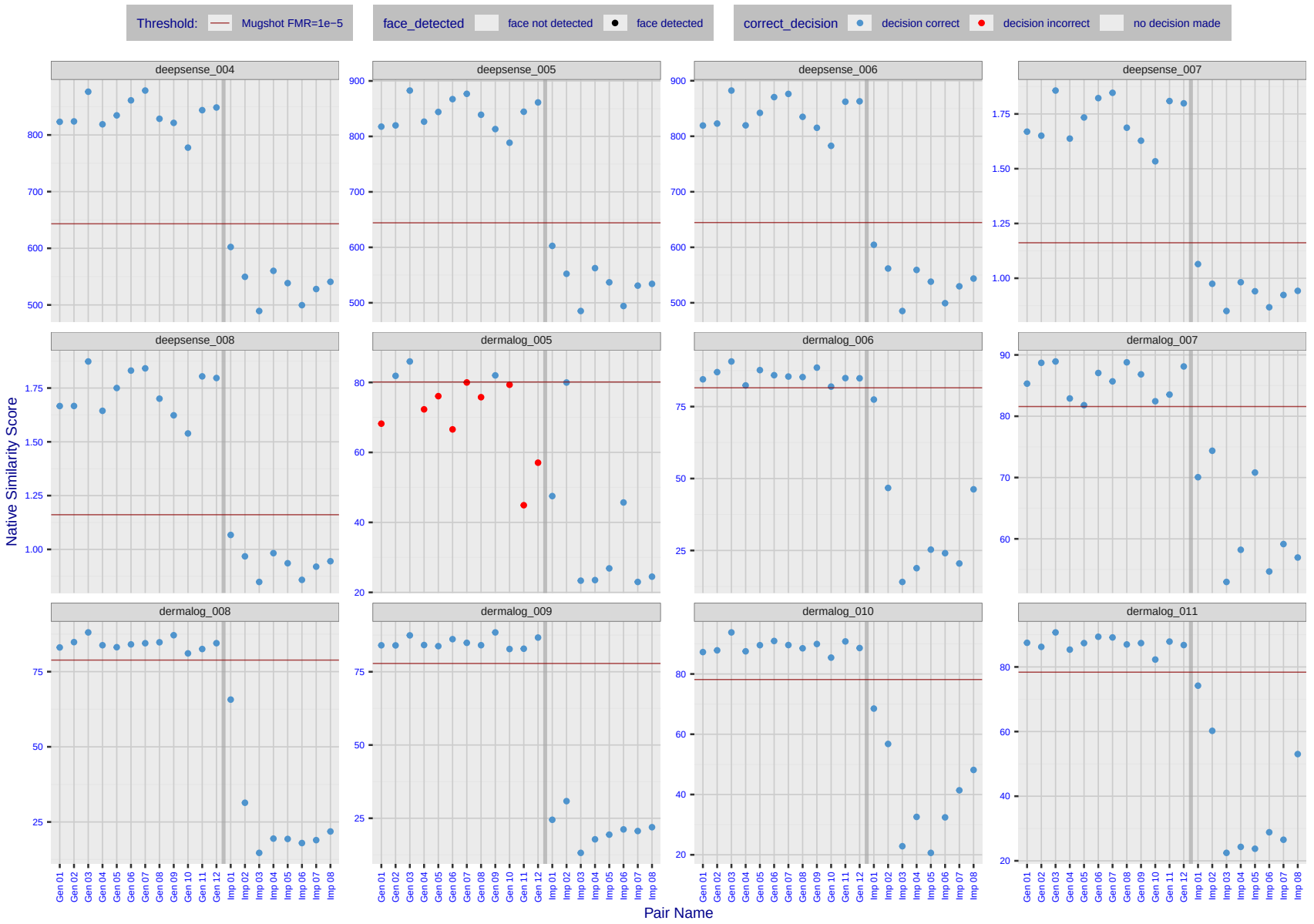

Figure 27: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

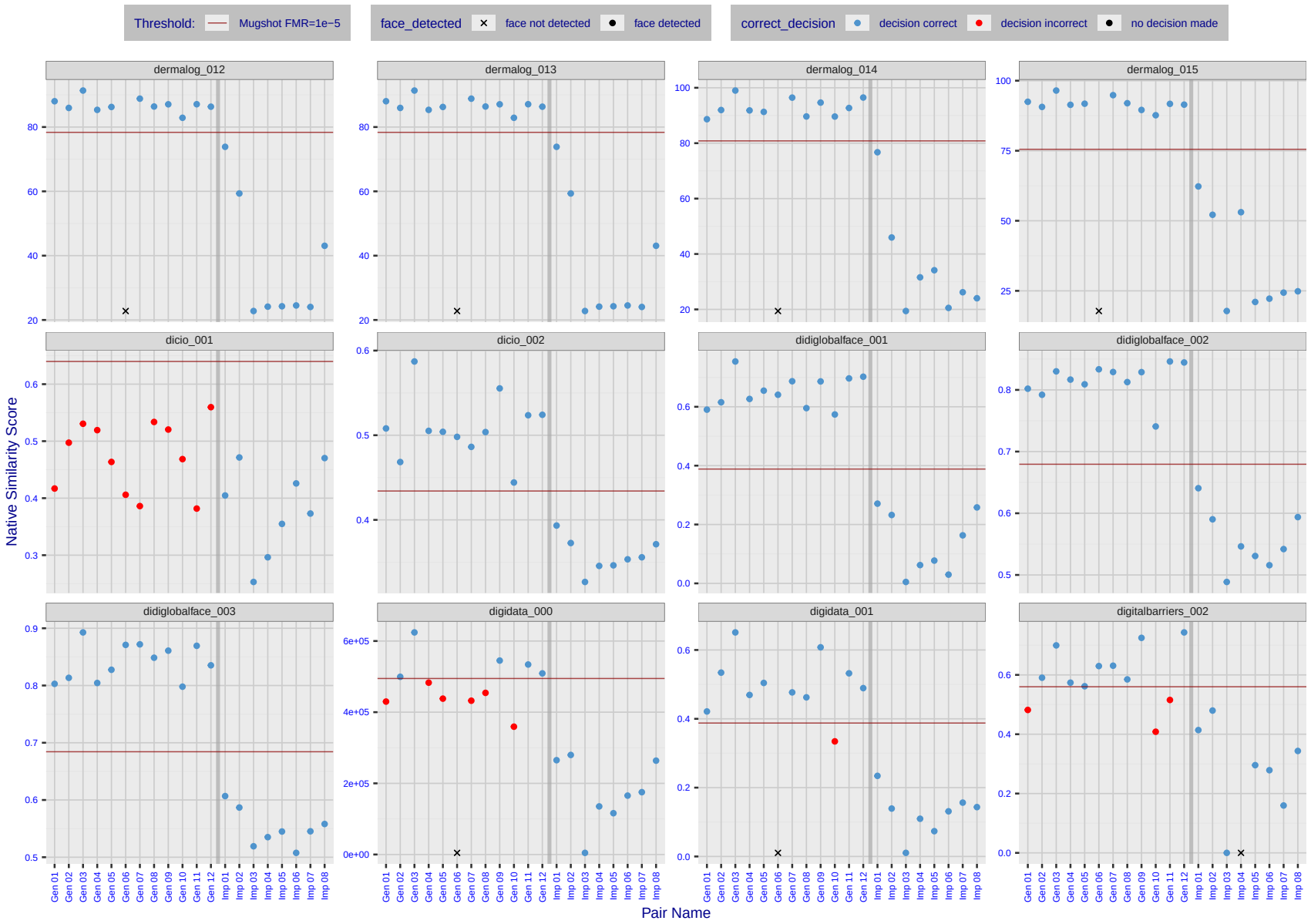

Figure 28: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

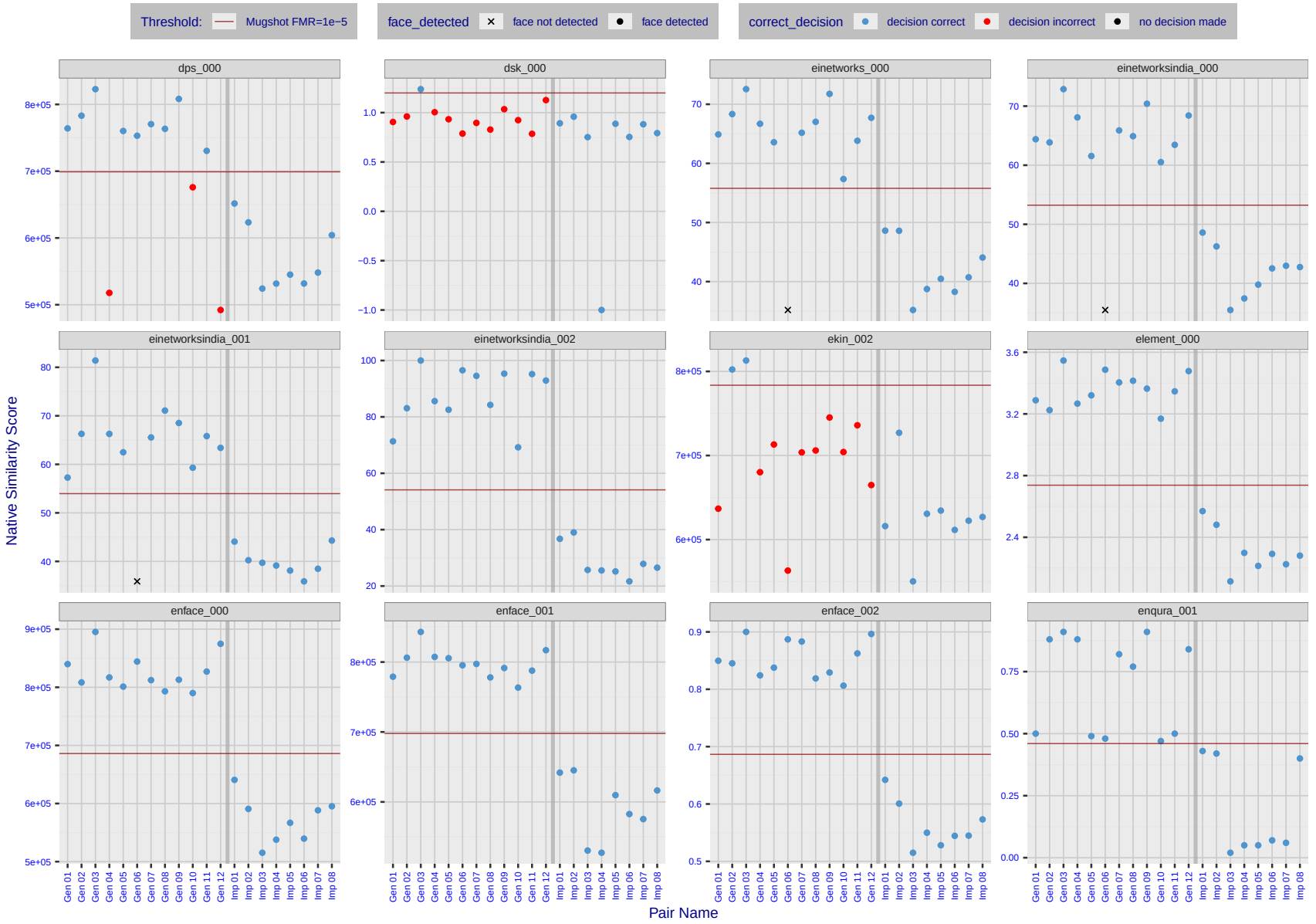

Figure 29: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

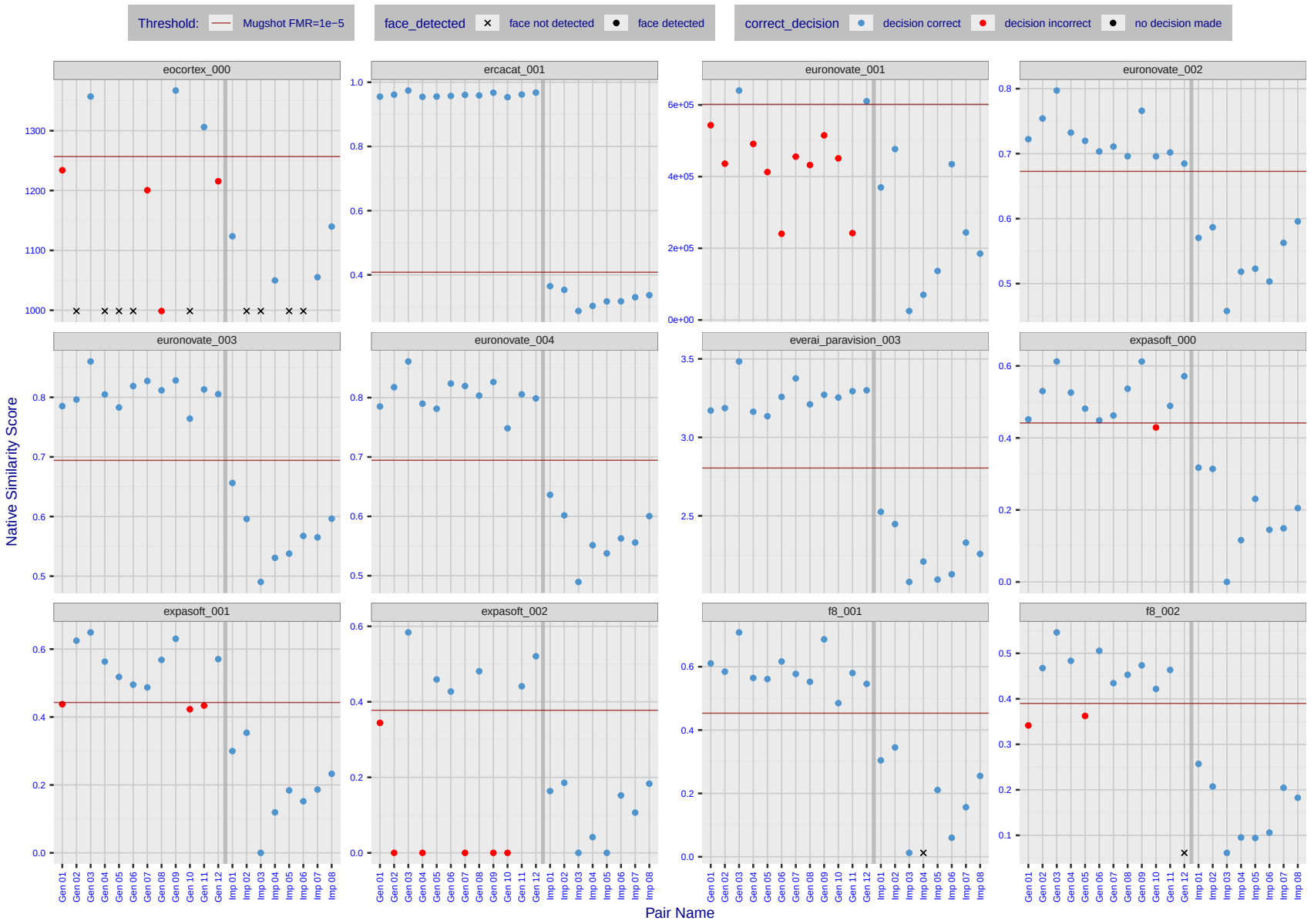

Figure 30: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

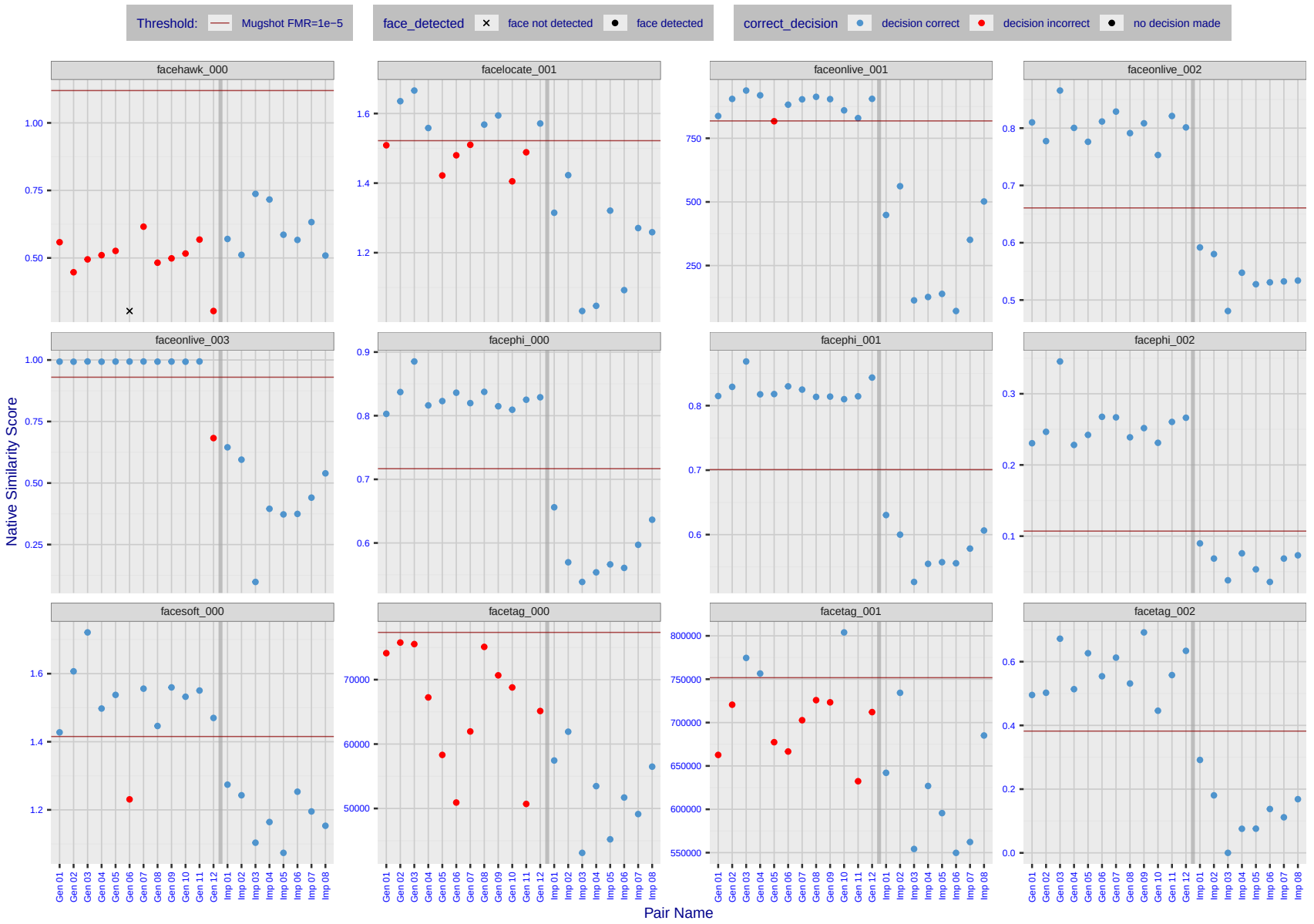

Figure 31: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

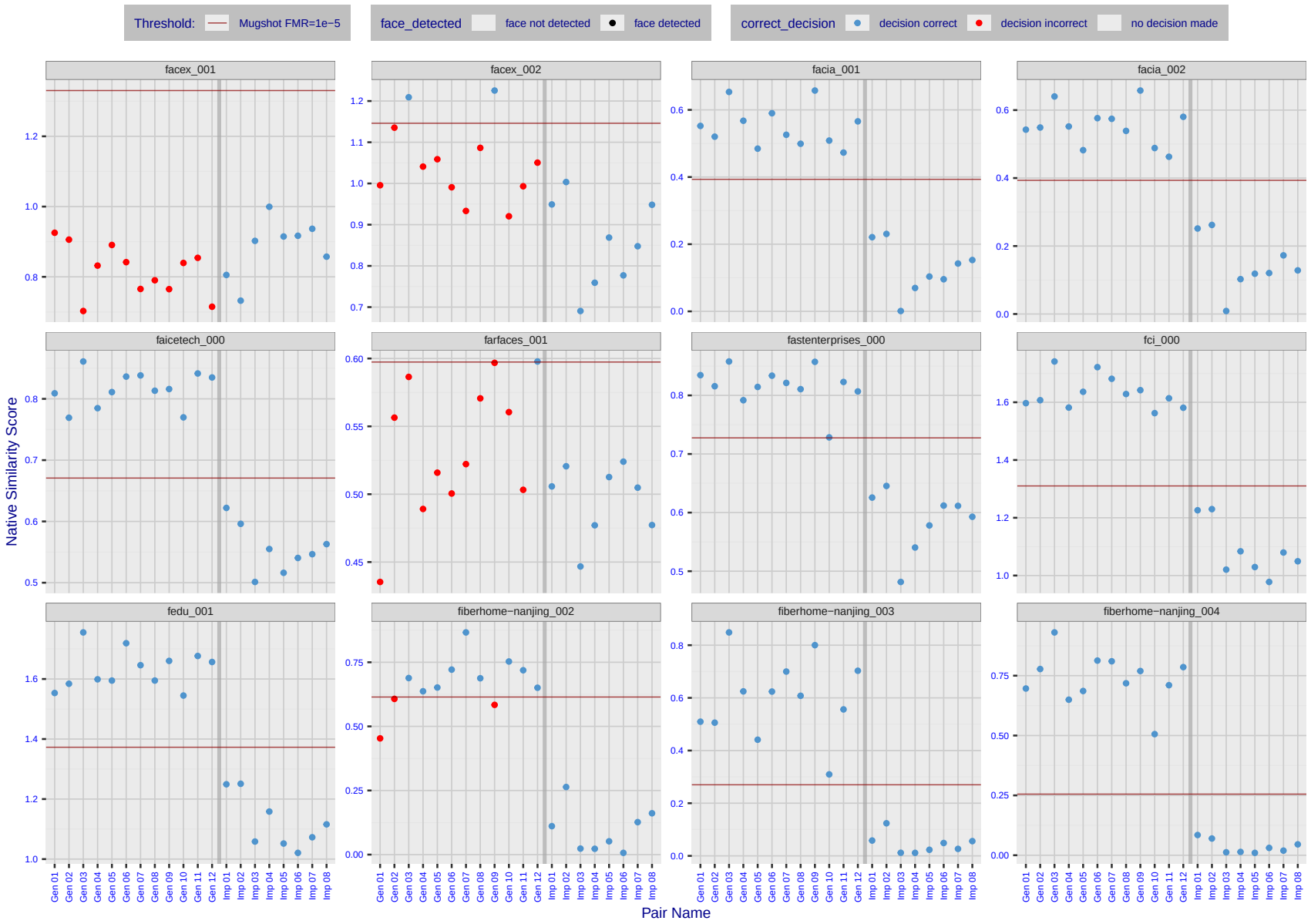

Figure 32: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

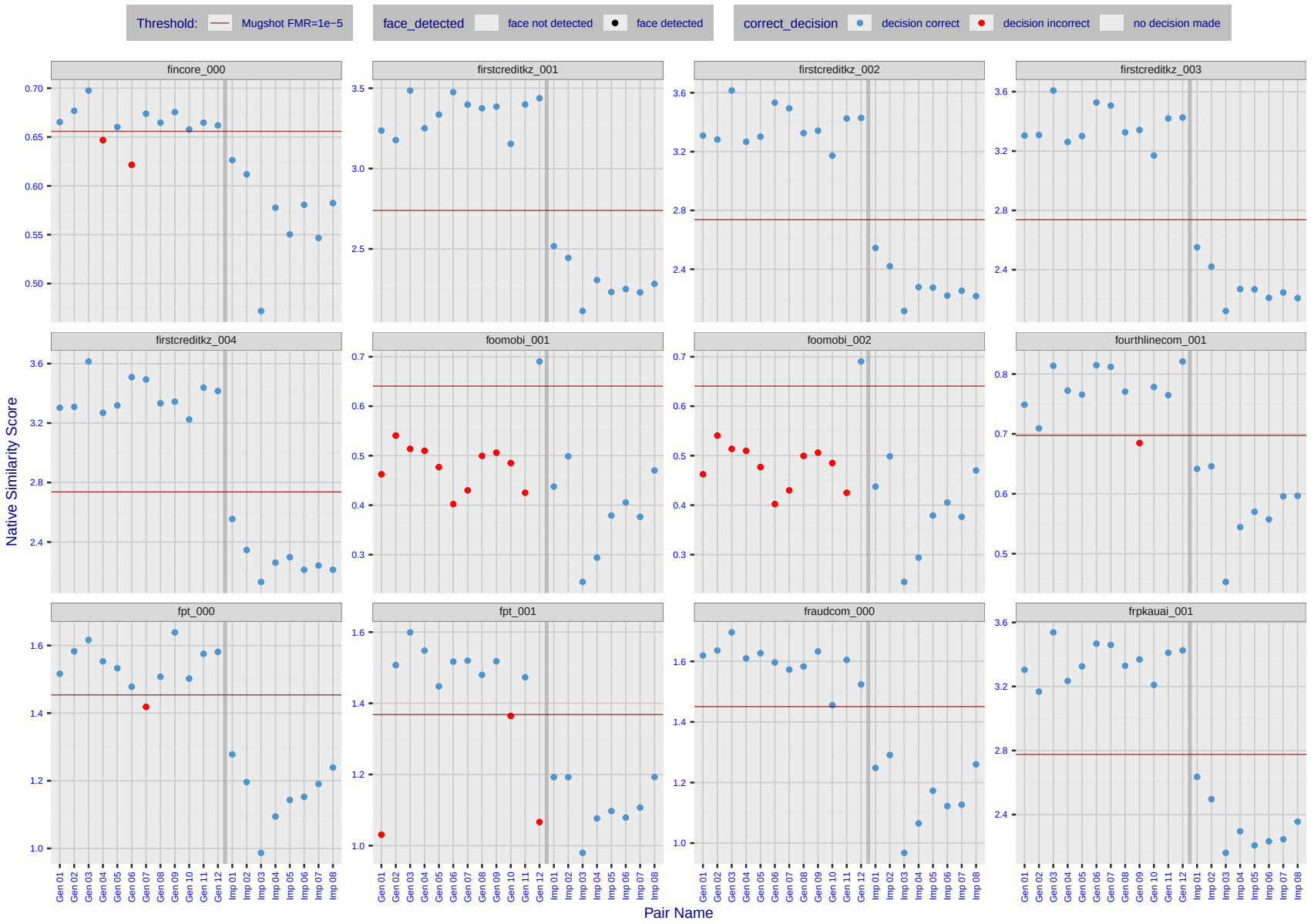

Figure 33: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

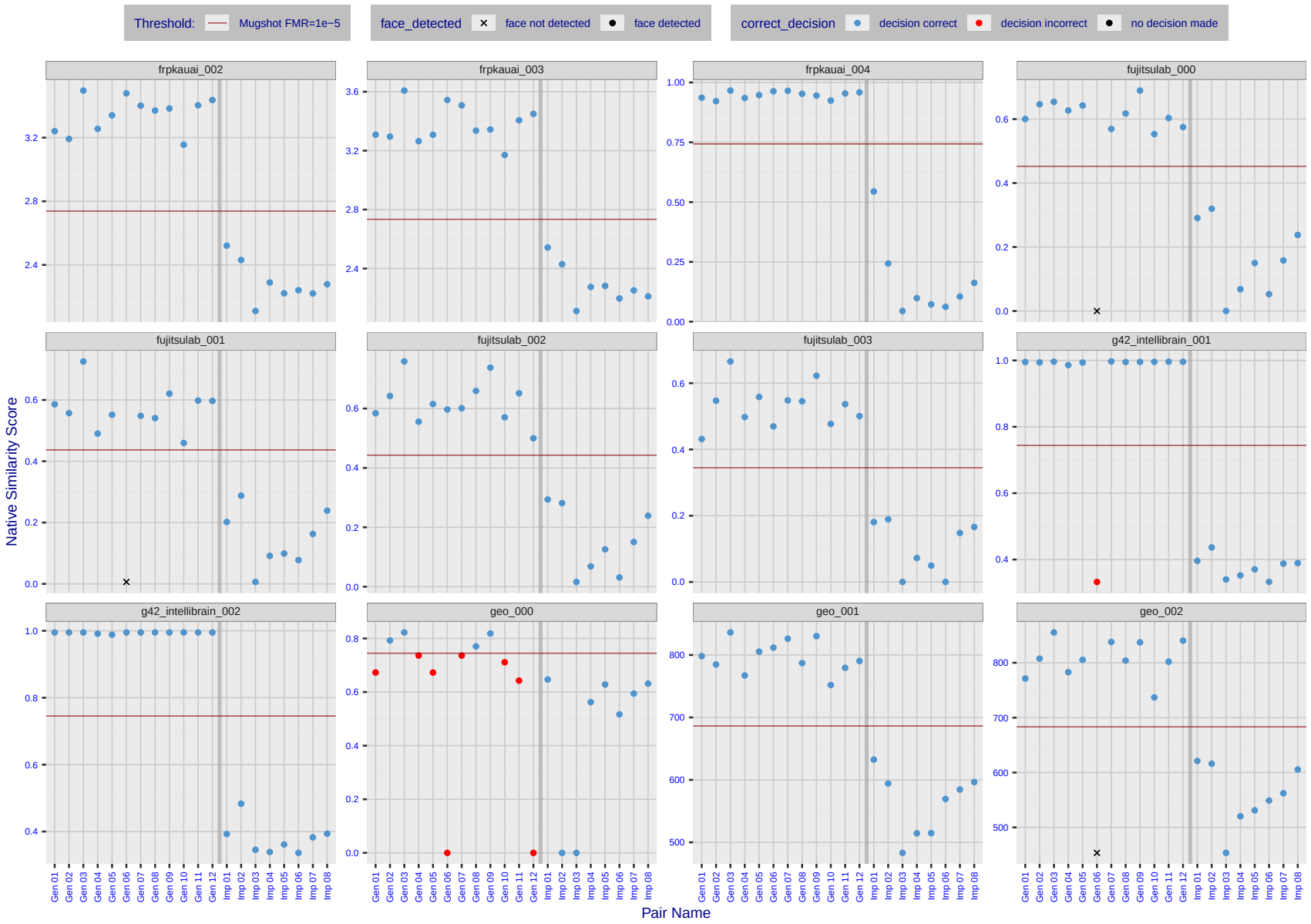

Figure 34: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

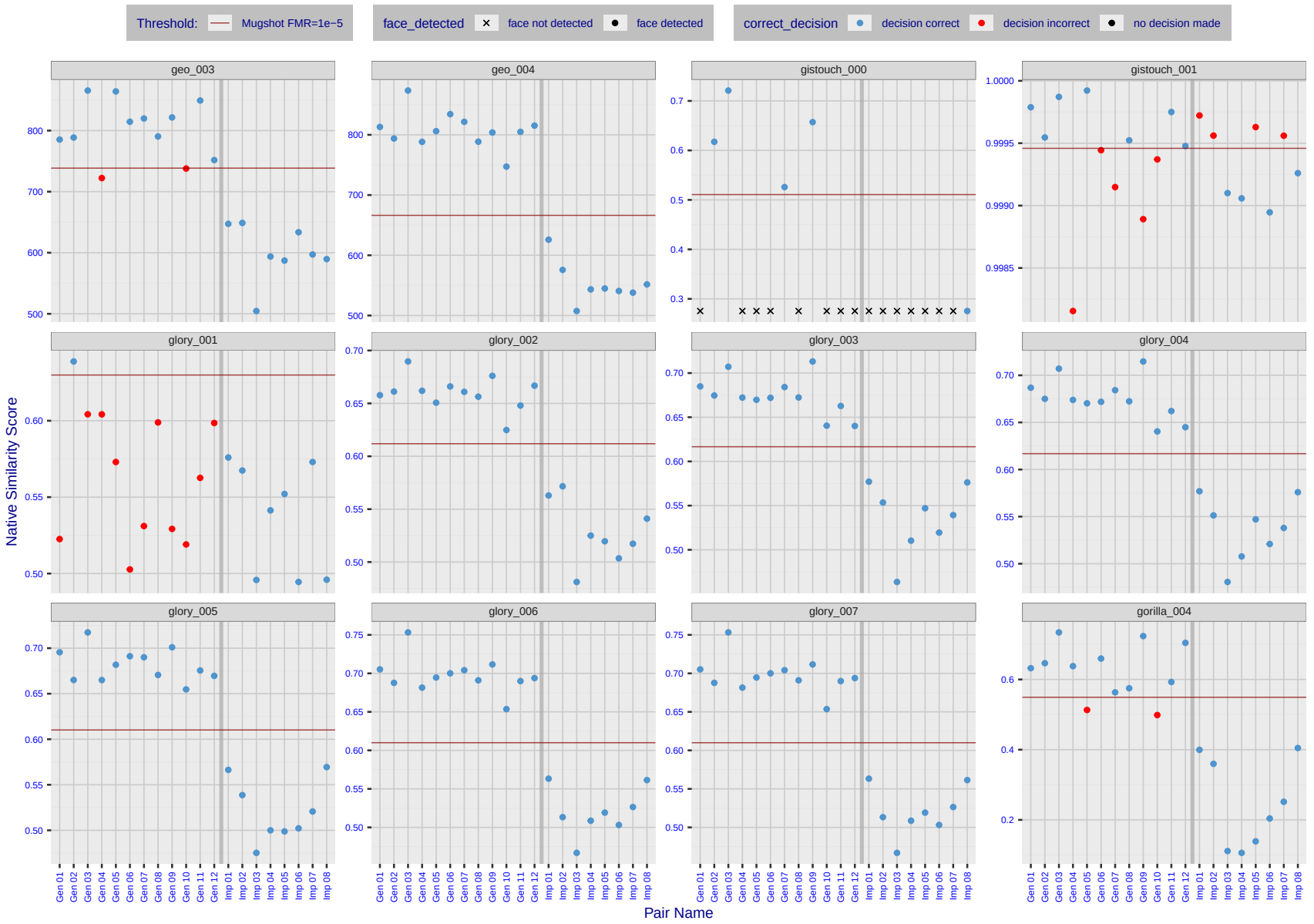

Figure 35: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

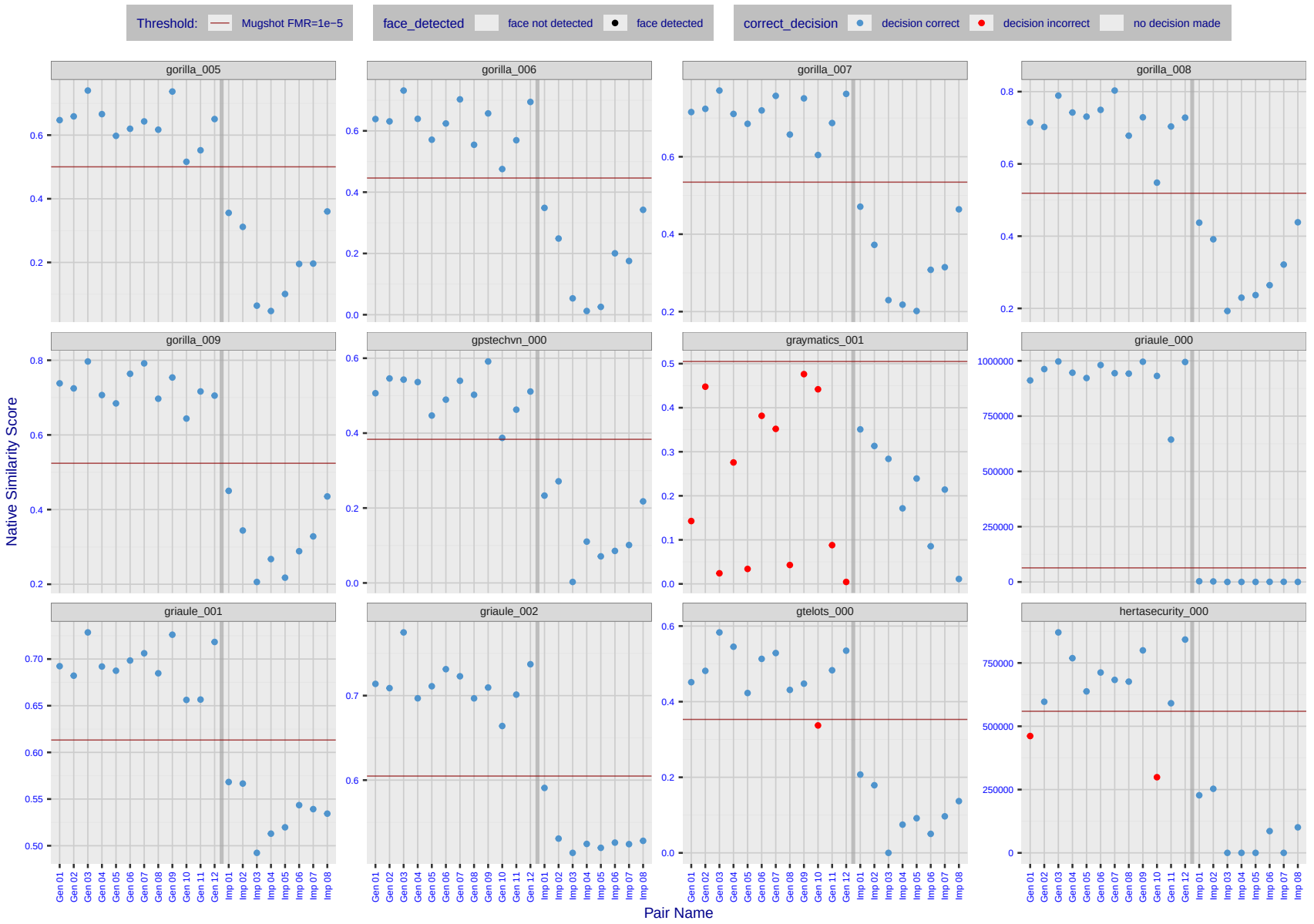

Figure 36: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

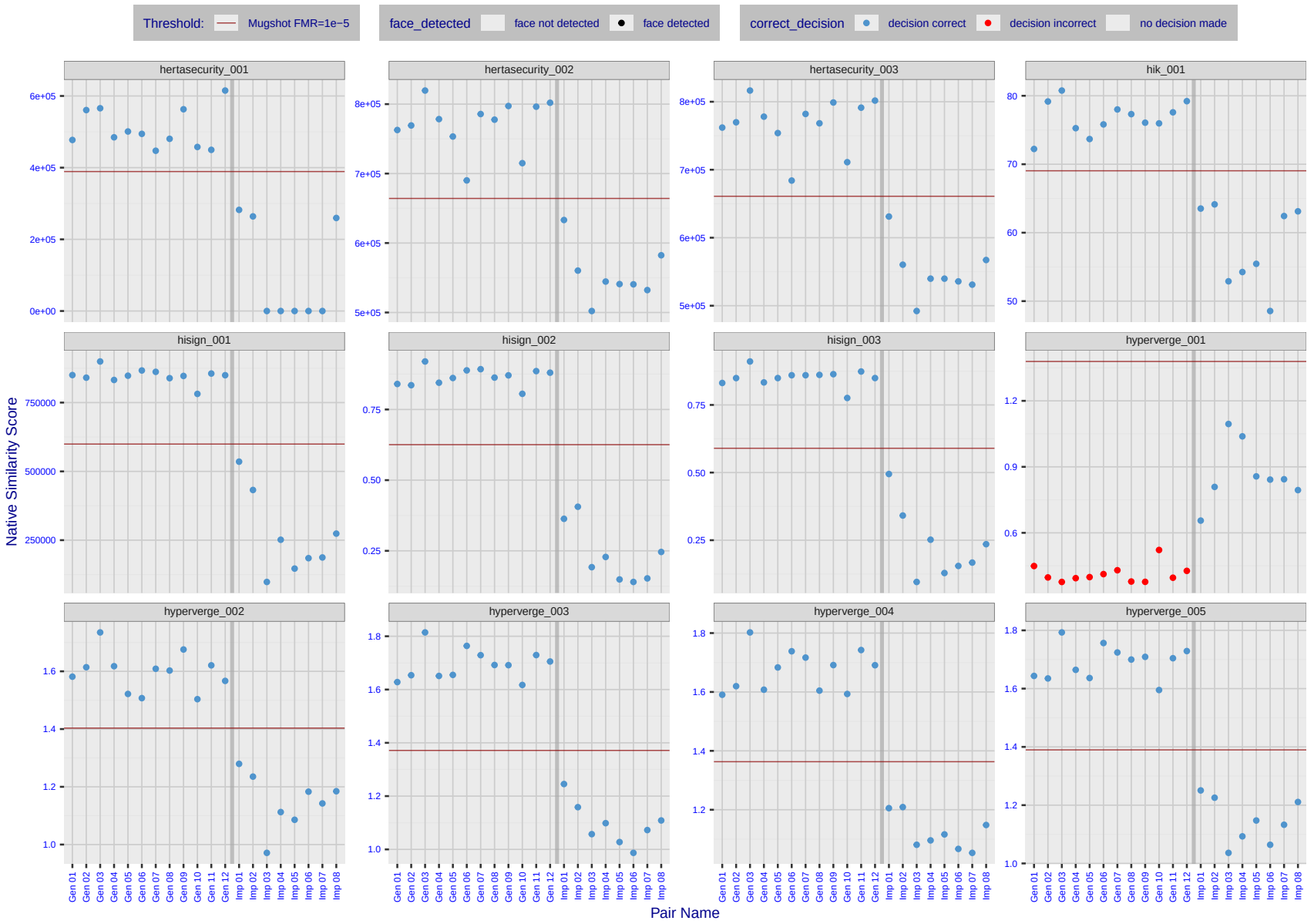

Figure 37: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

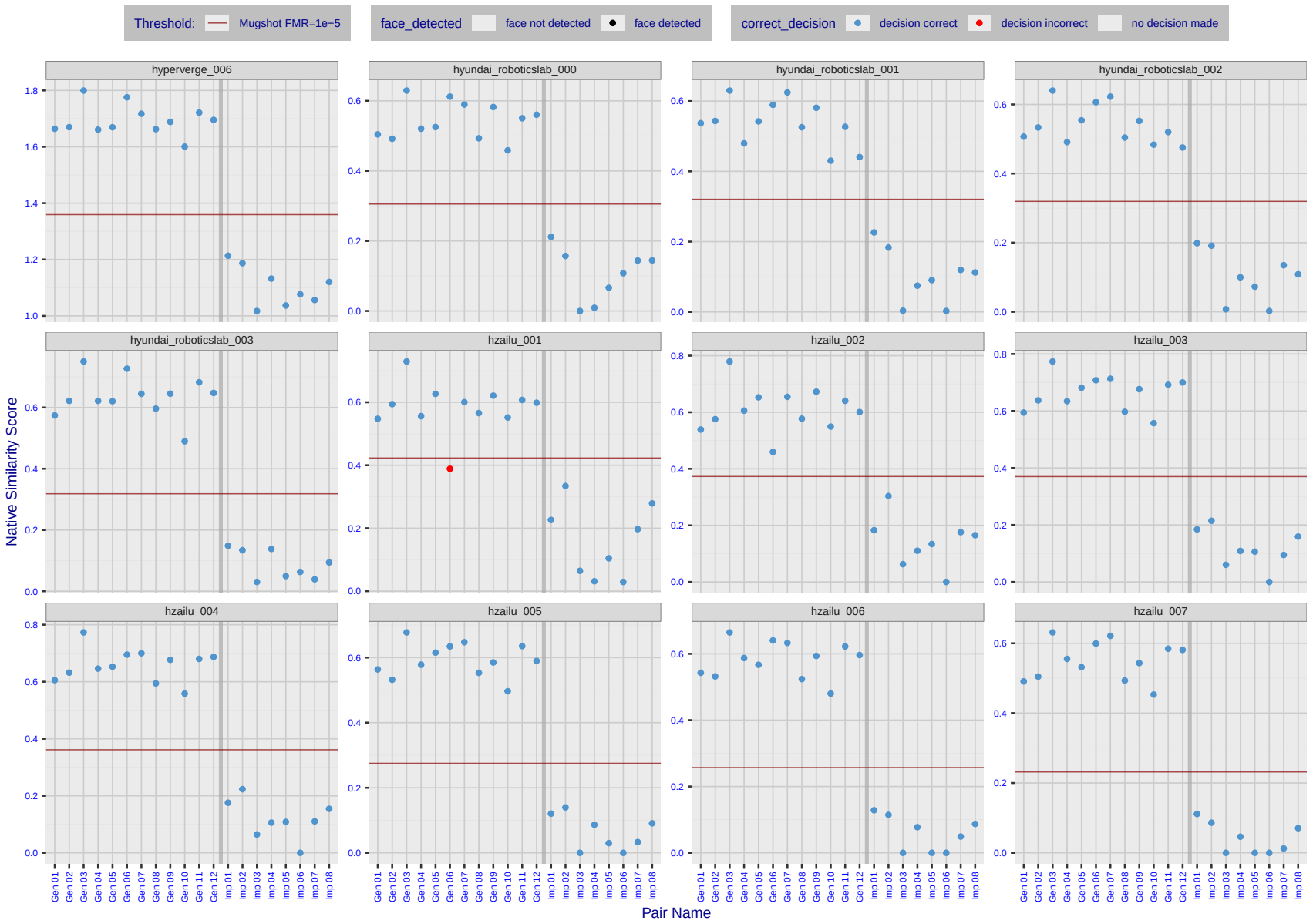

Figure 38: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

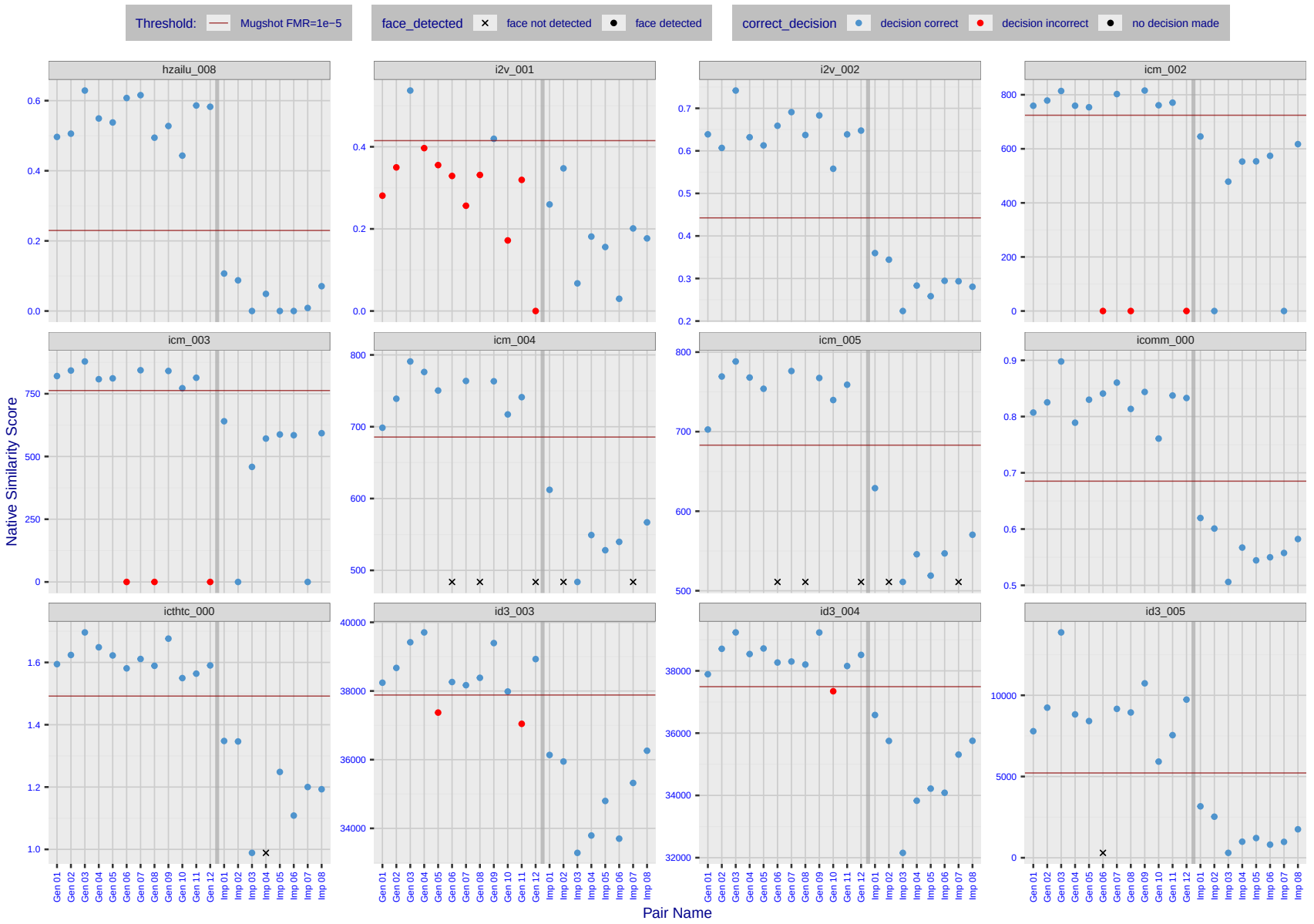

Figure 39: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

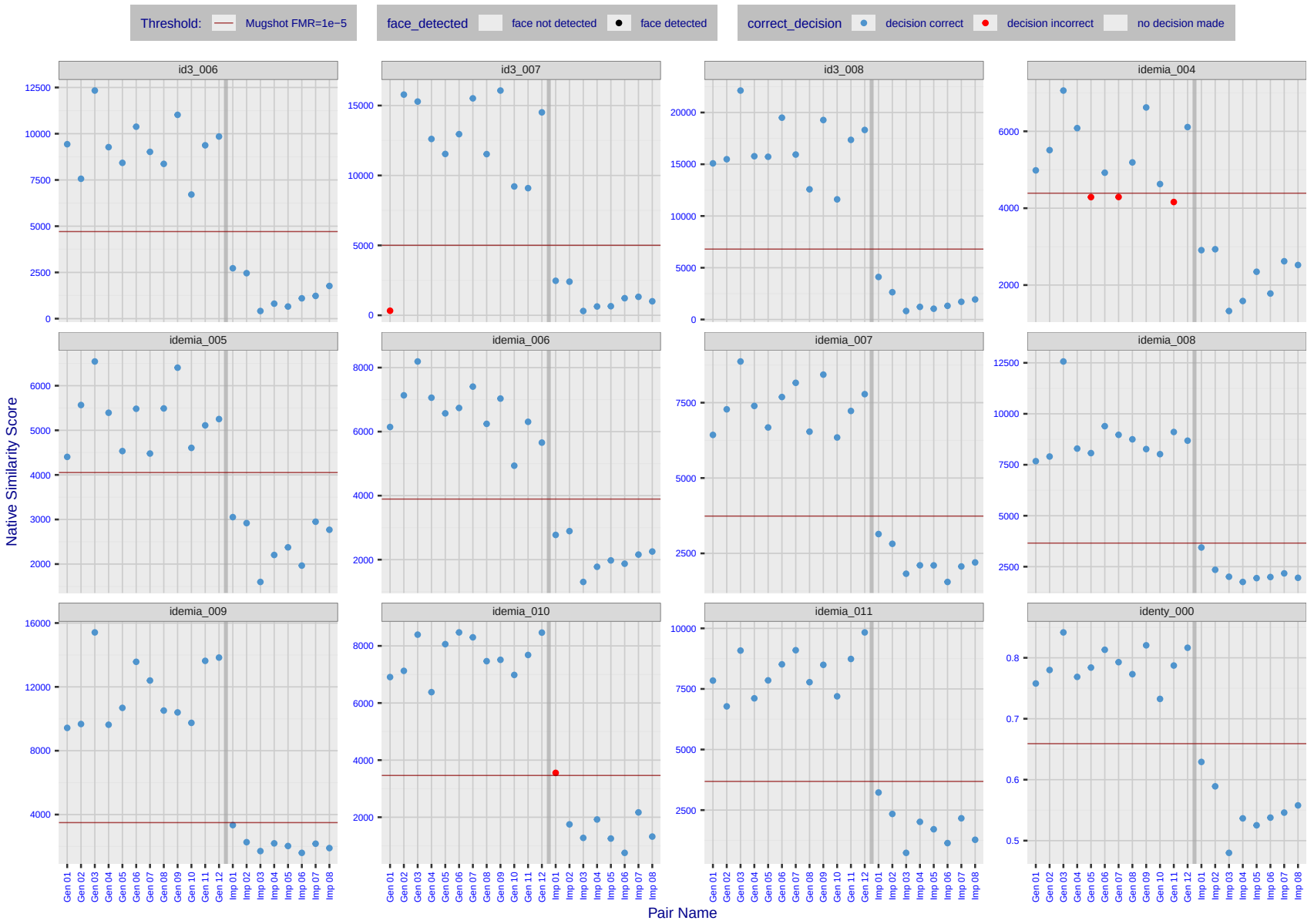

Figure 40: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

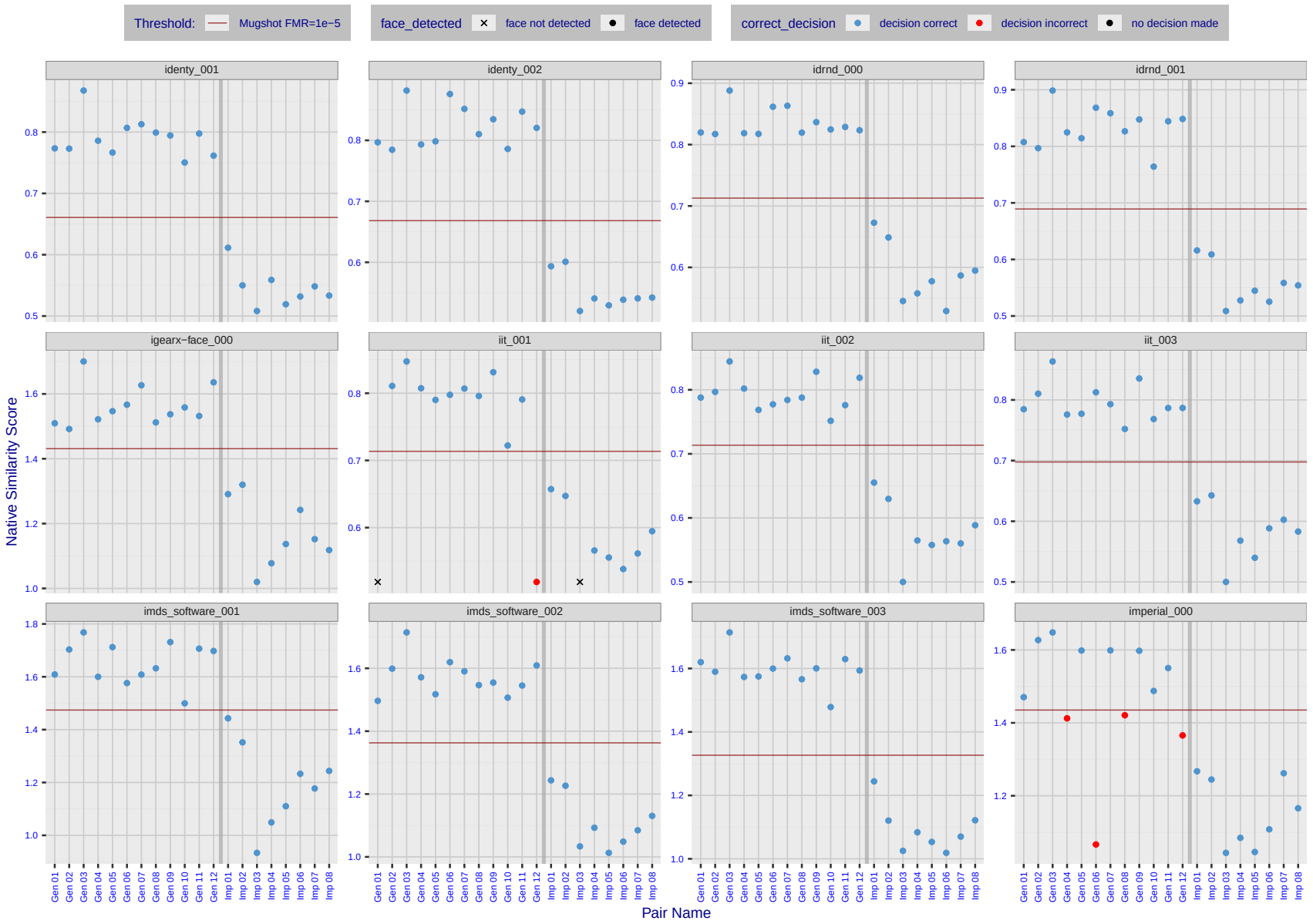

Figure 41: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

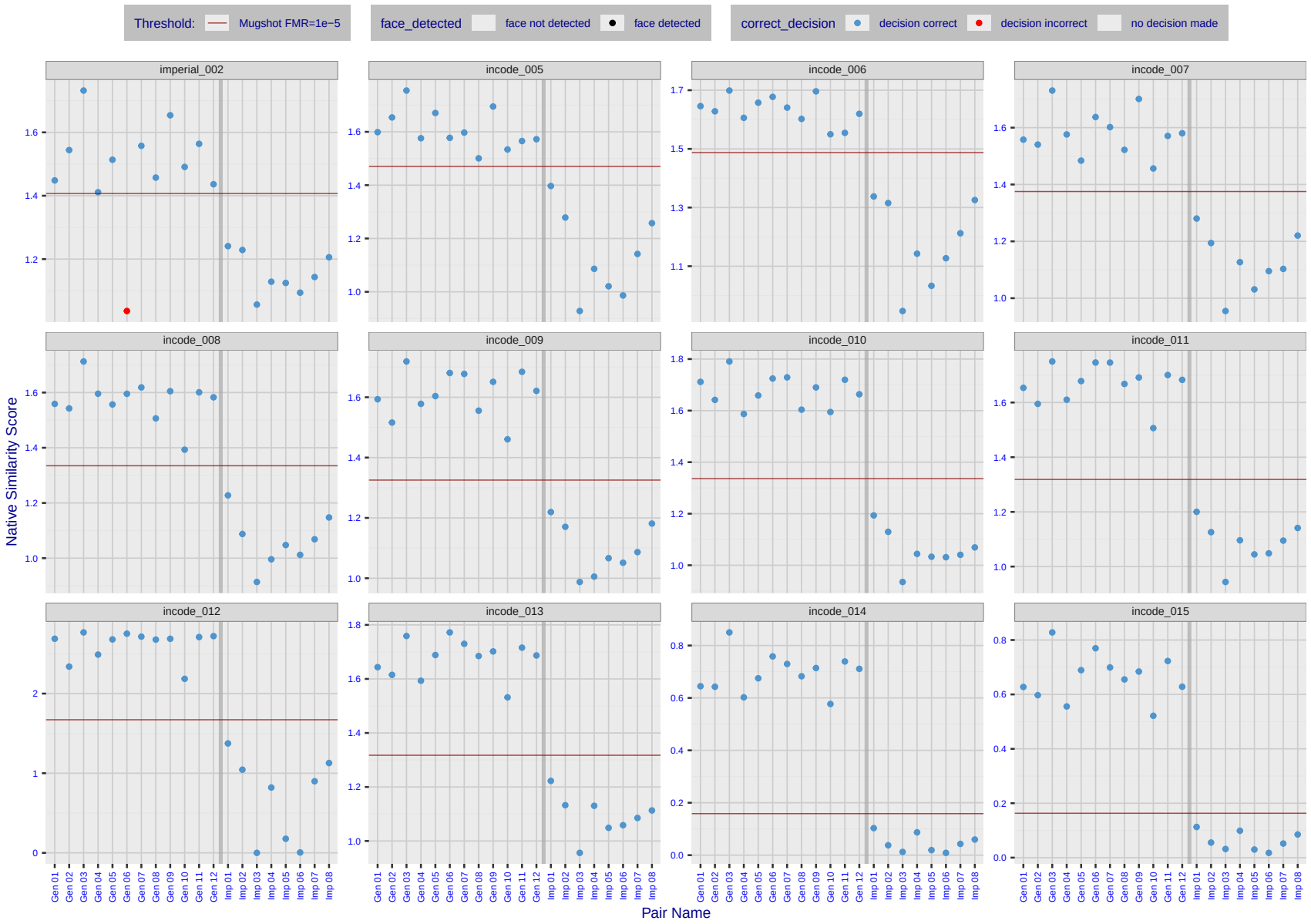

Figure 42: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

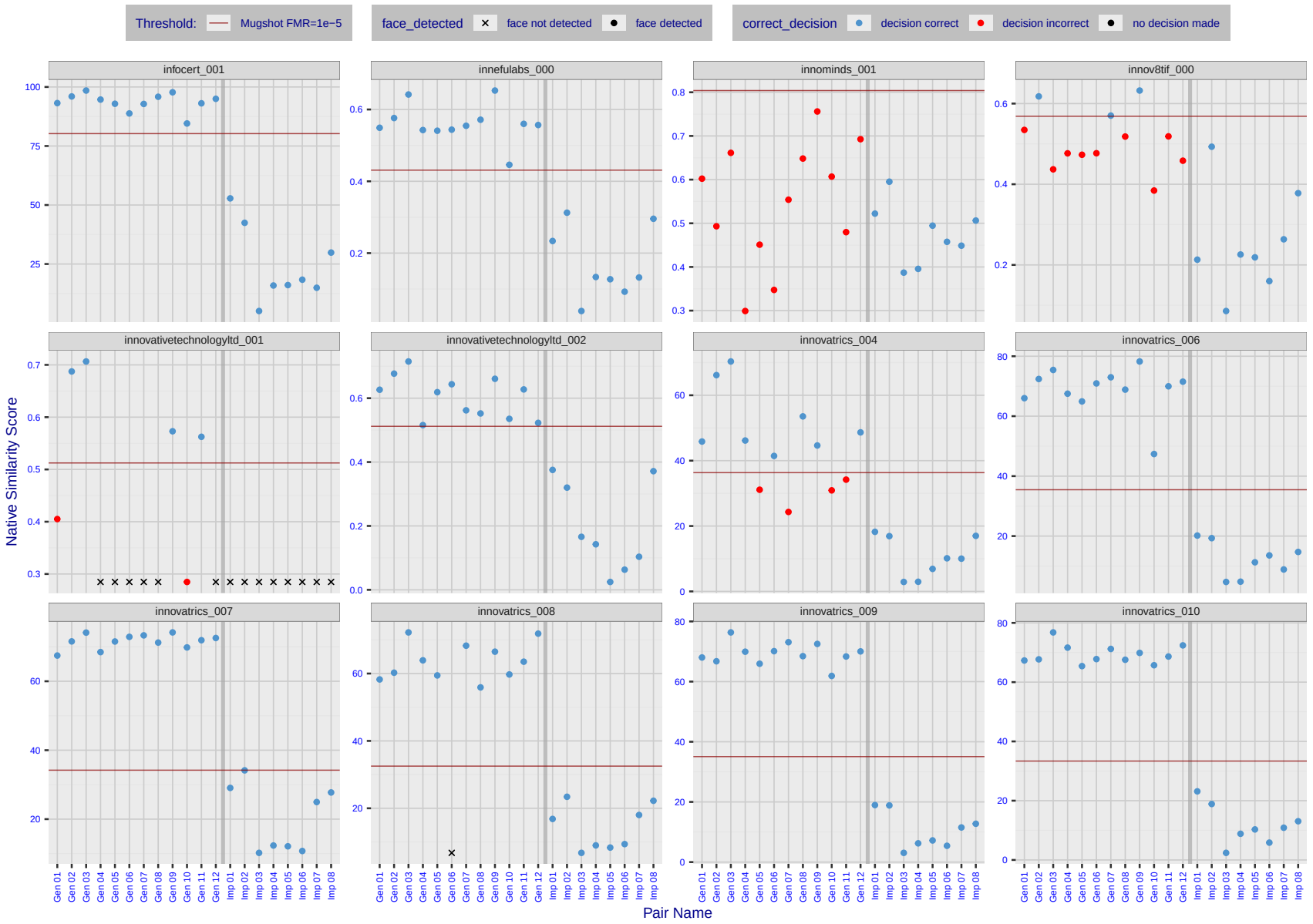

Figure 43: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

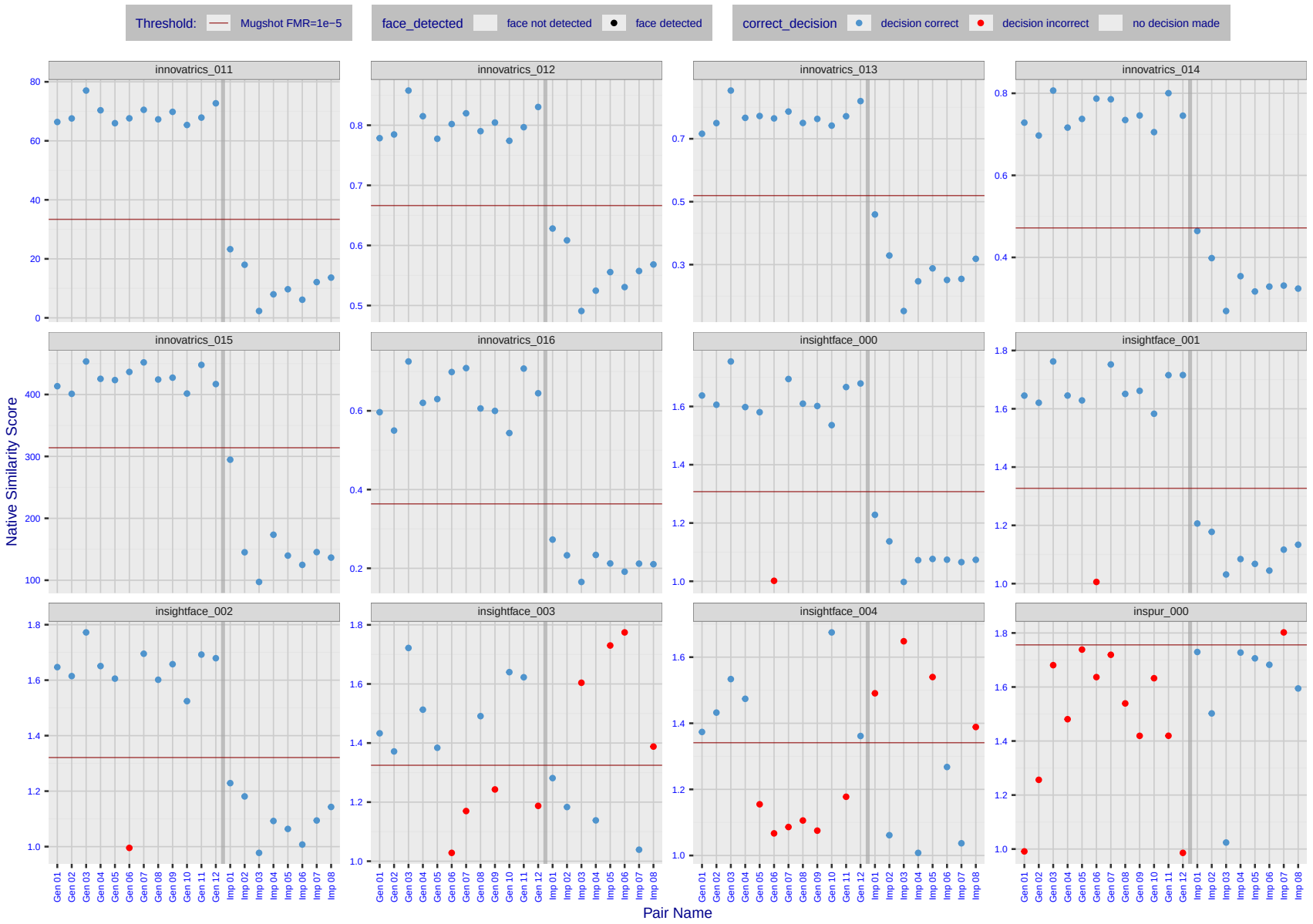

Figure 44: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

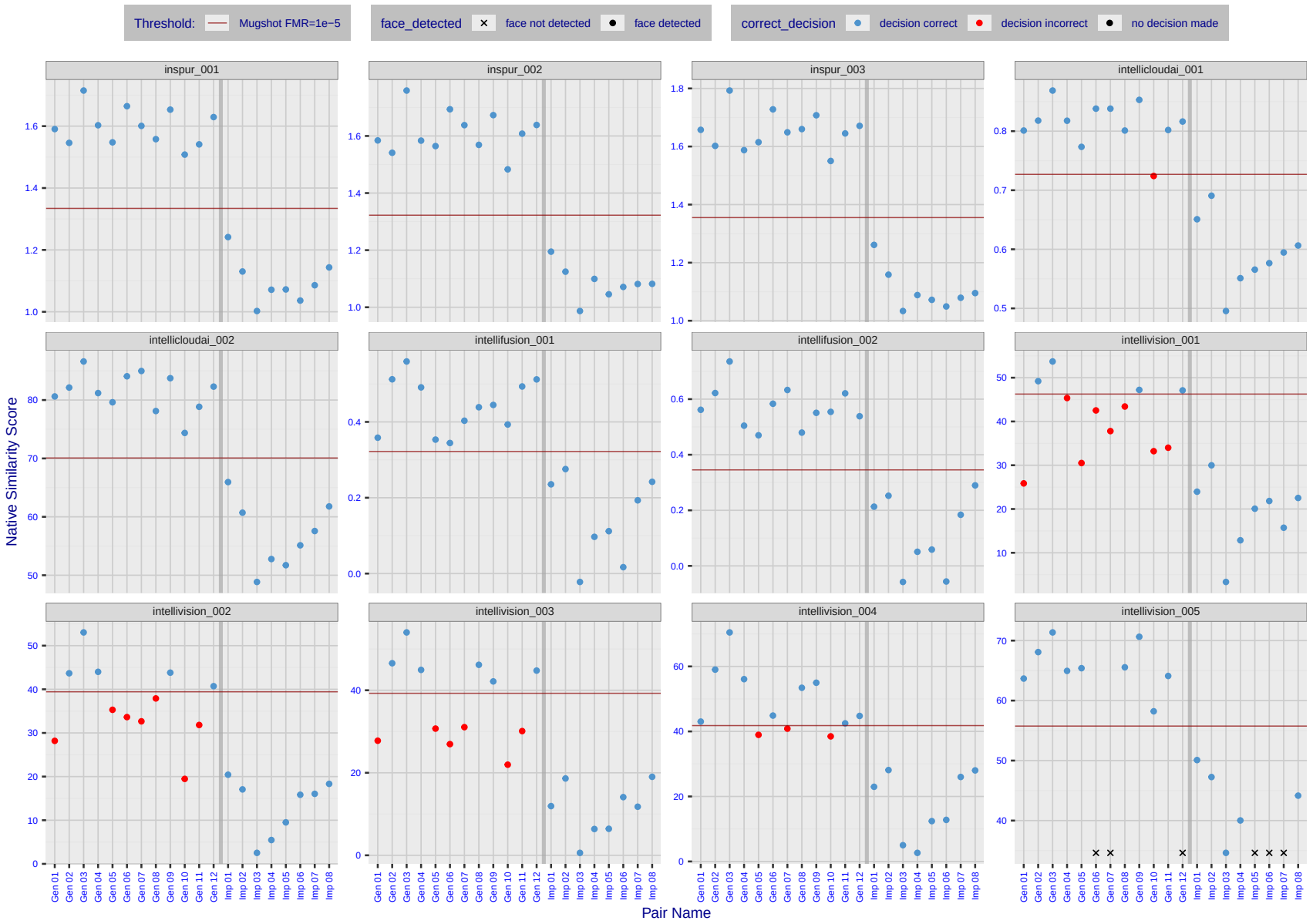

Figure 45: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

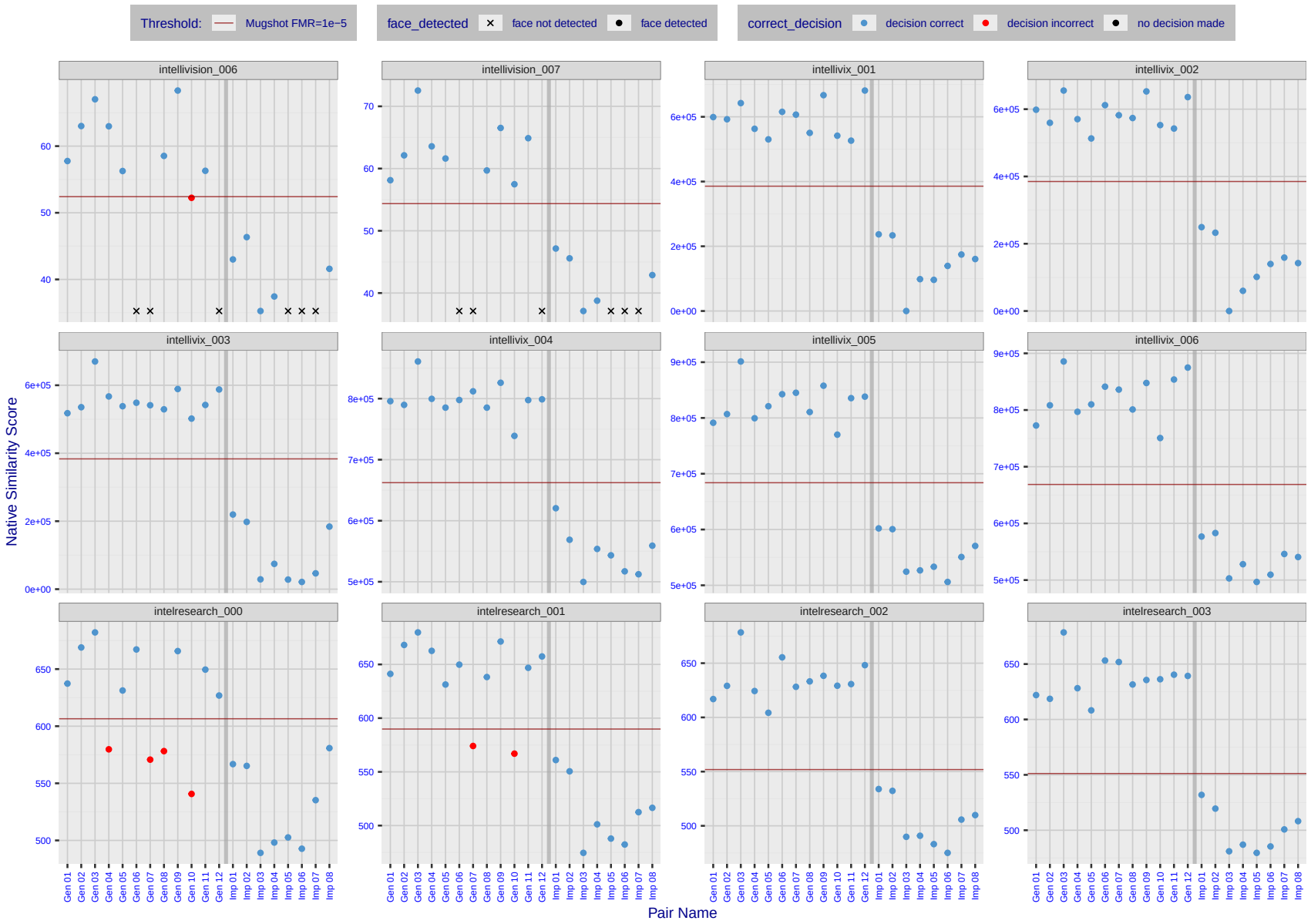

Figure 46: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

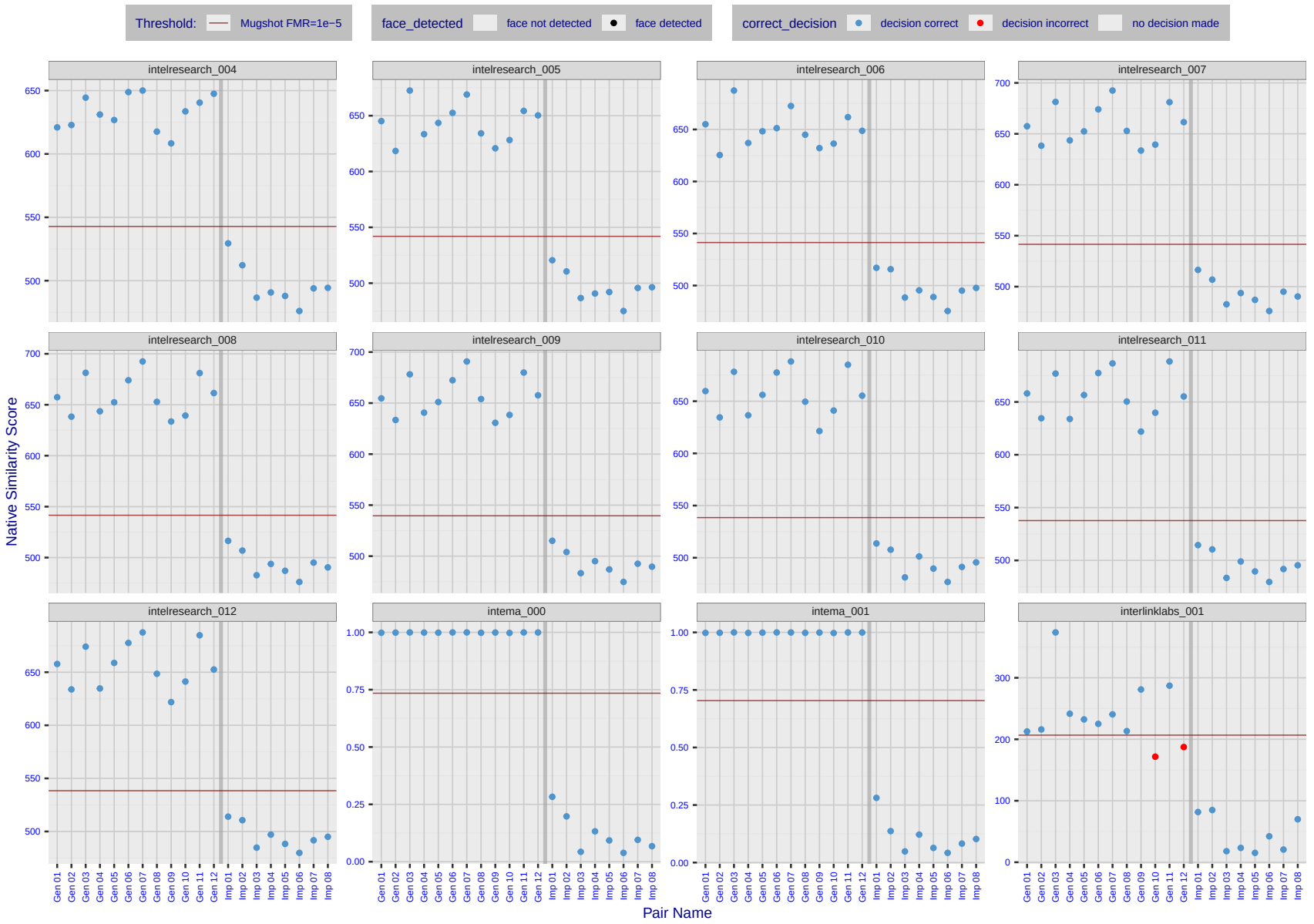

Figure 47: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

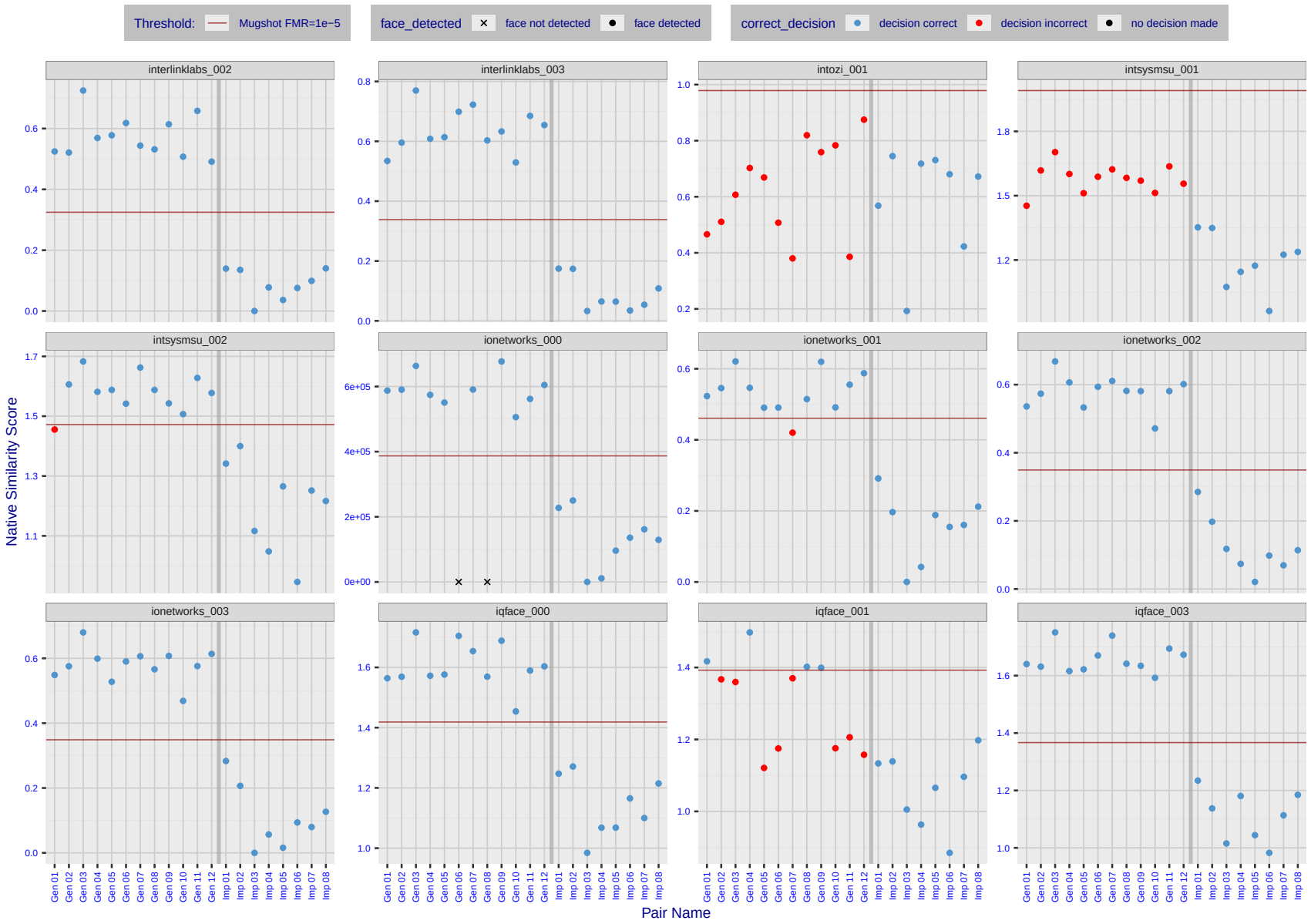

Figure 48: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

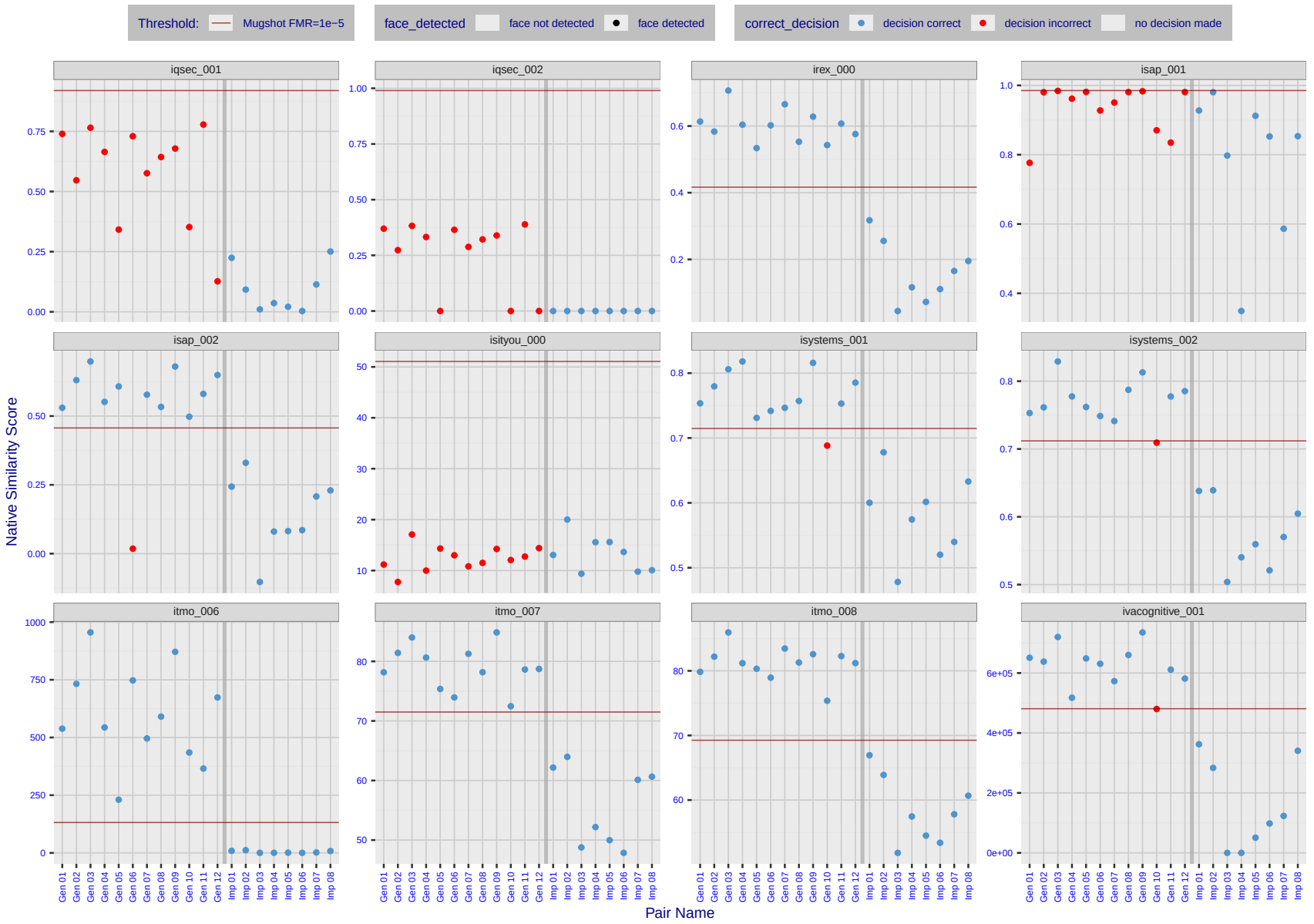

Figure 49: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

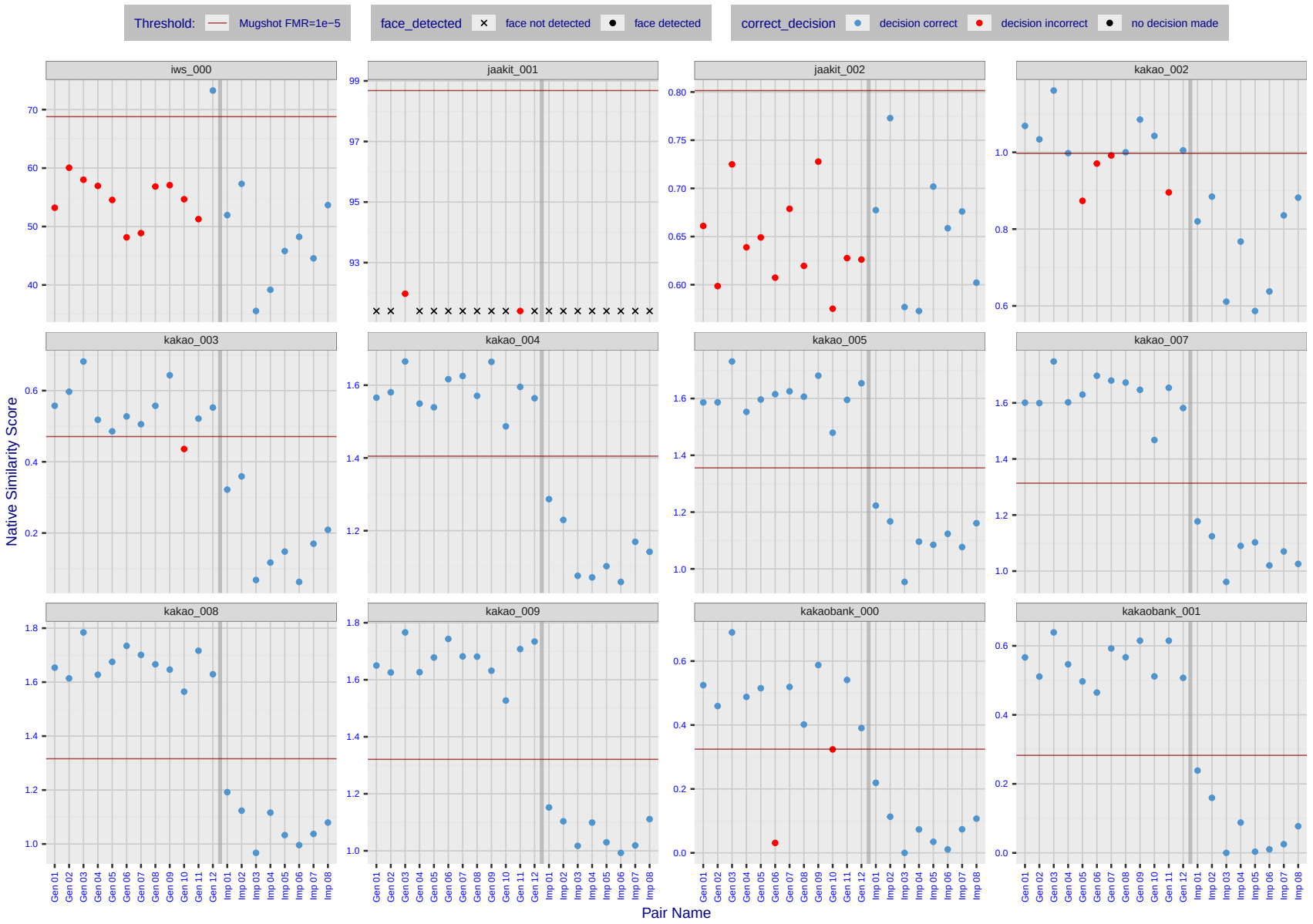

Figure 50: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

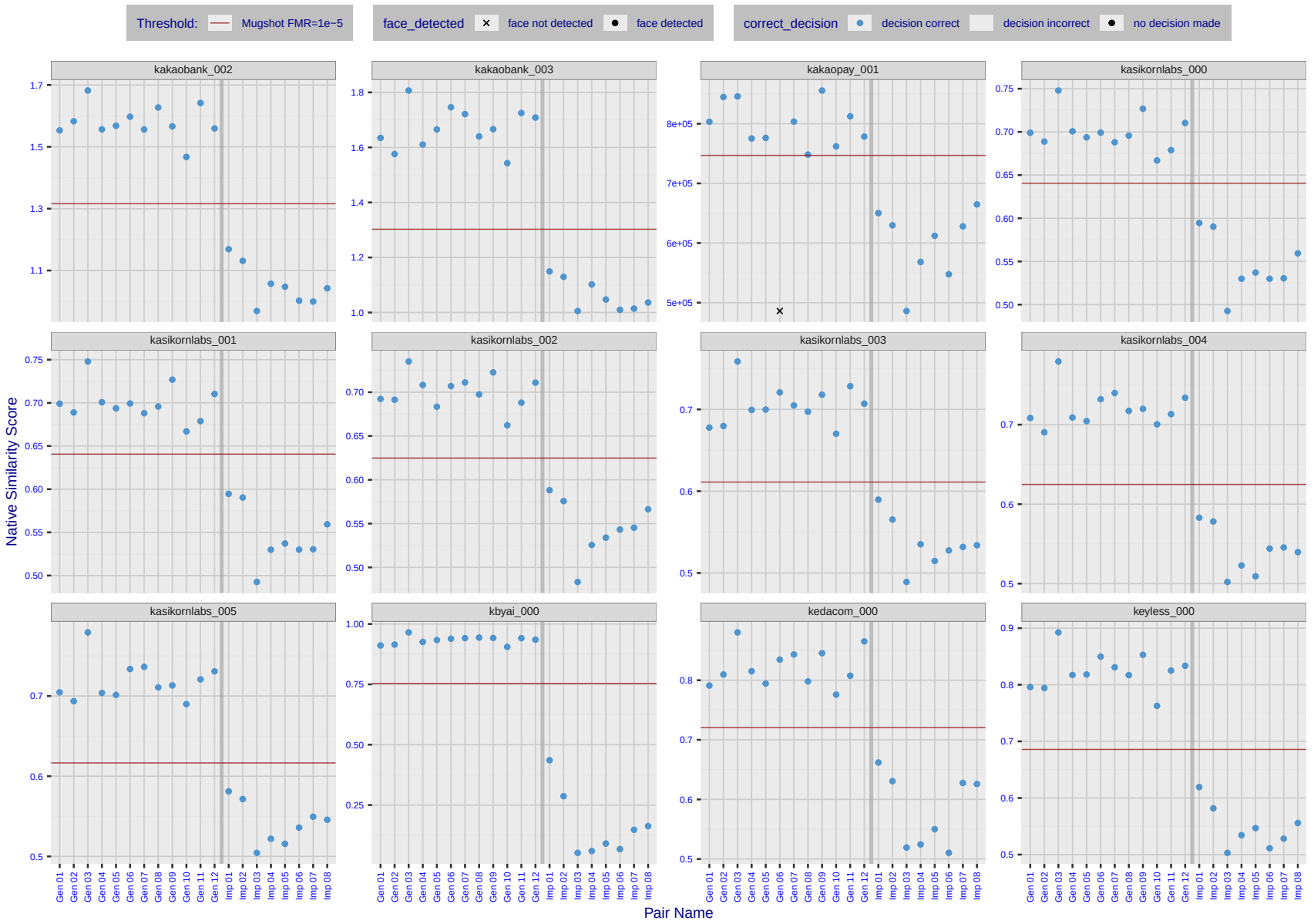

Figure 51: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

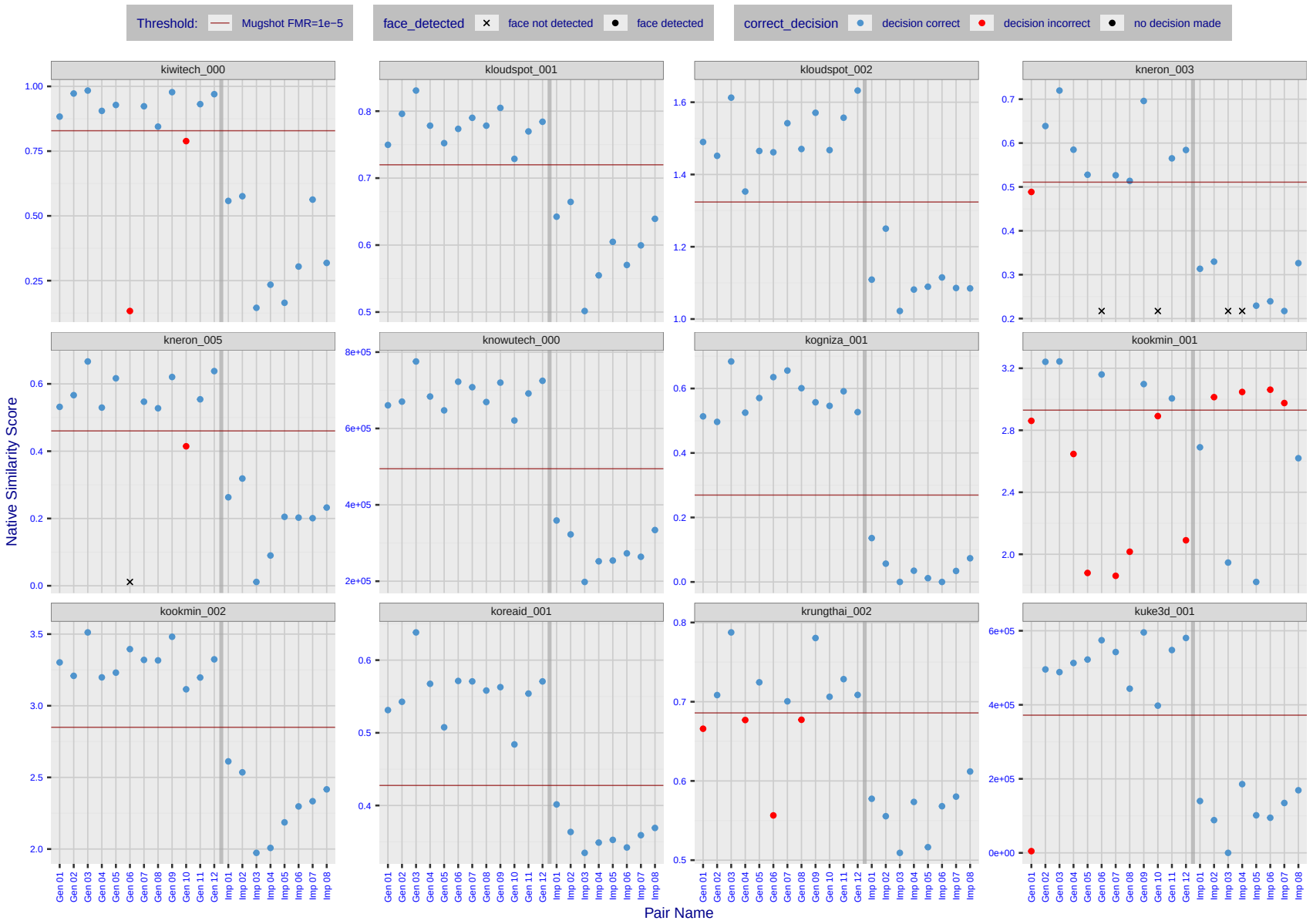

Figure 52: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

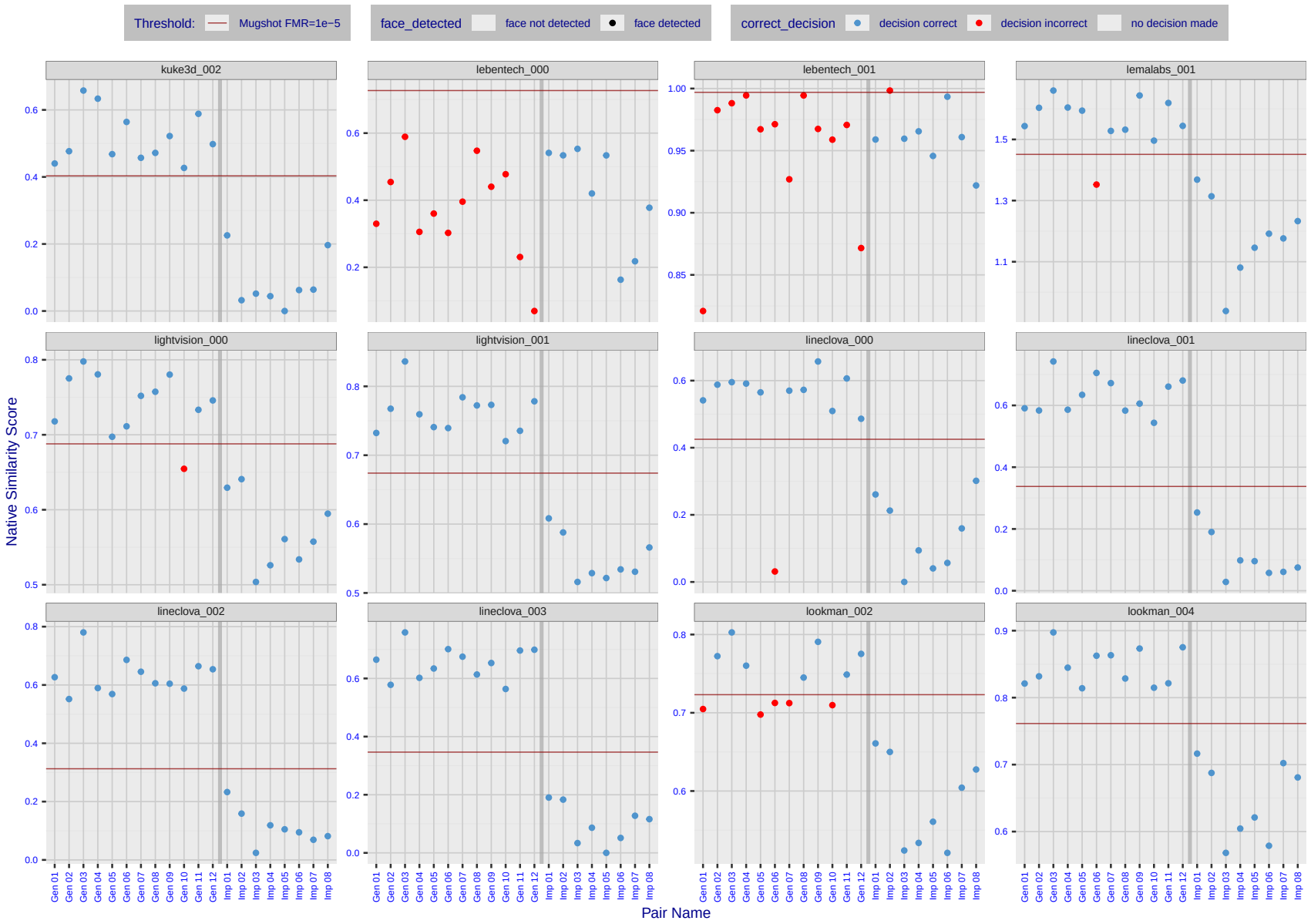

Figure 53: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

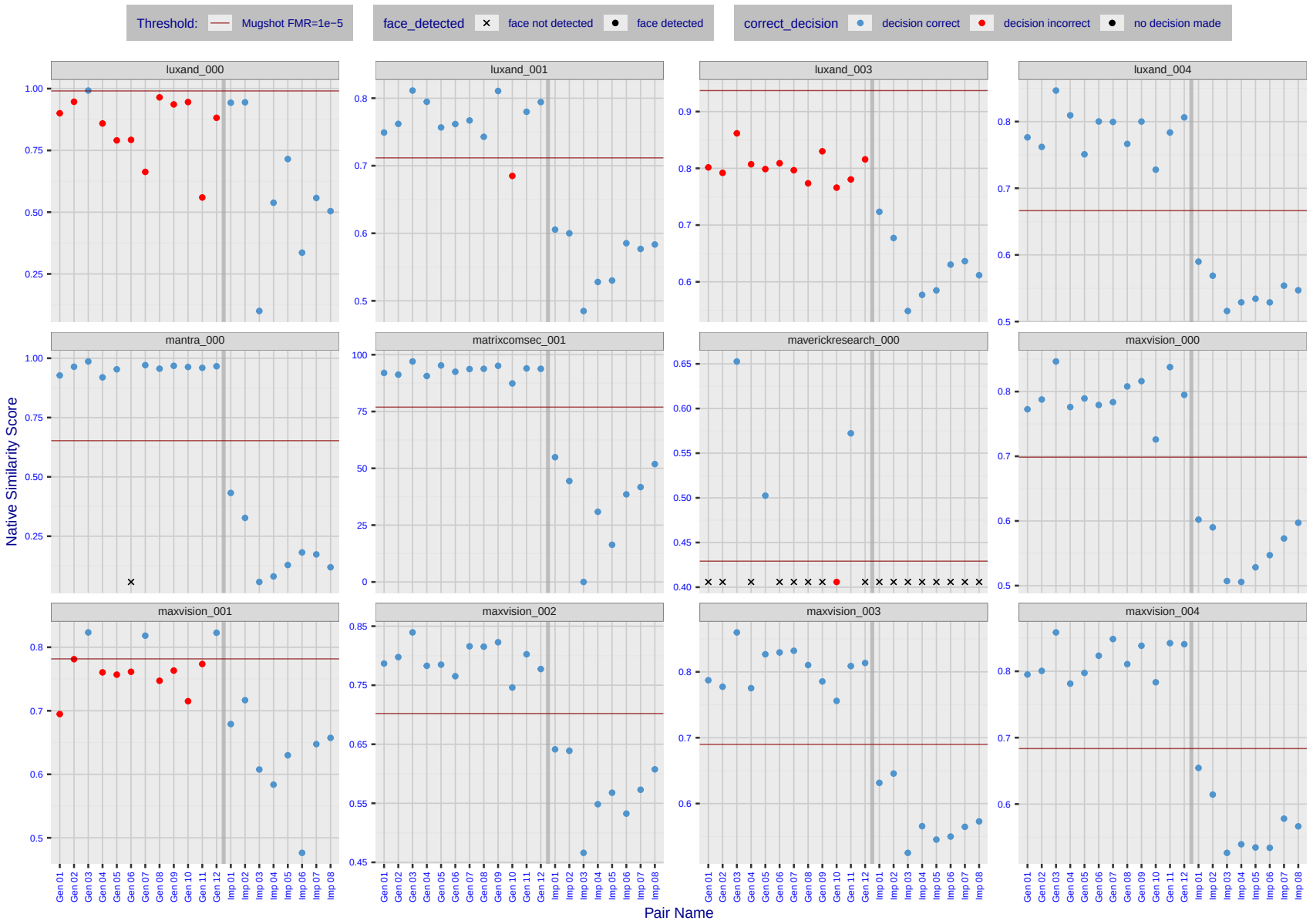

Figure 54: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

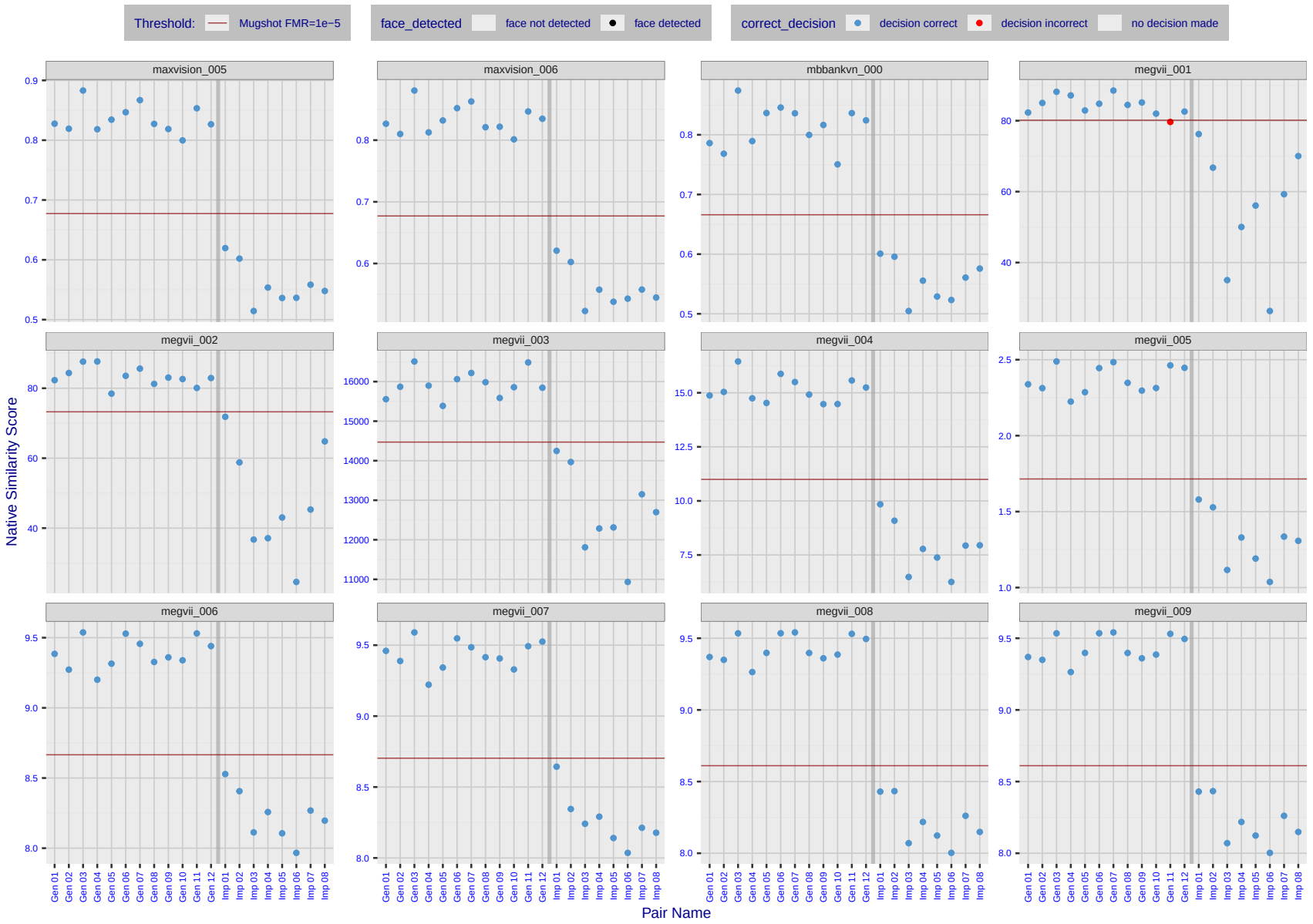

Figure 55: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

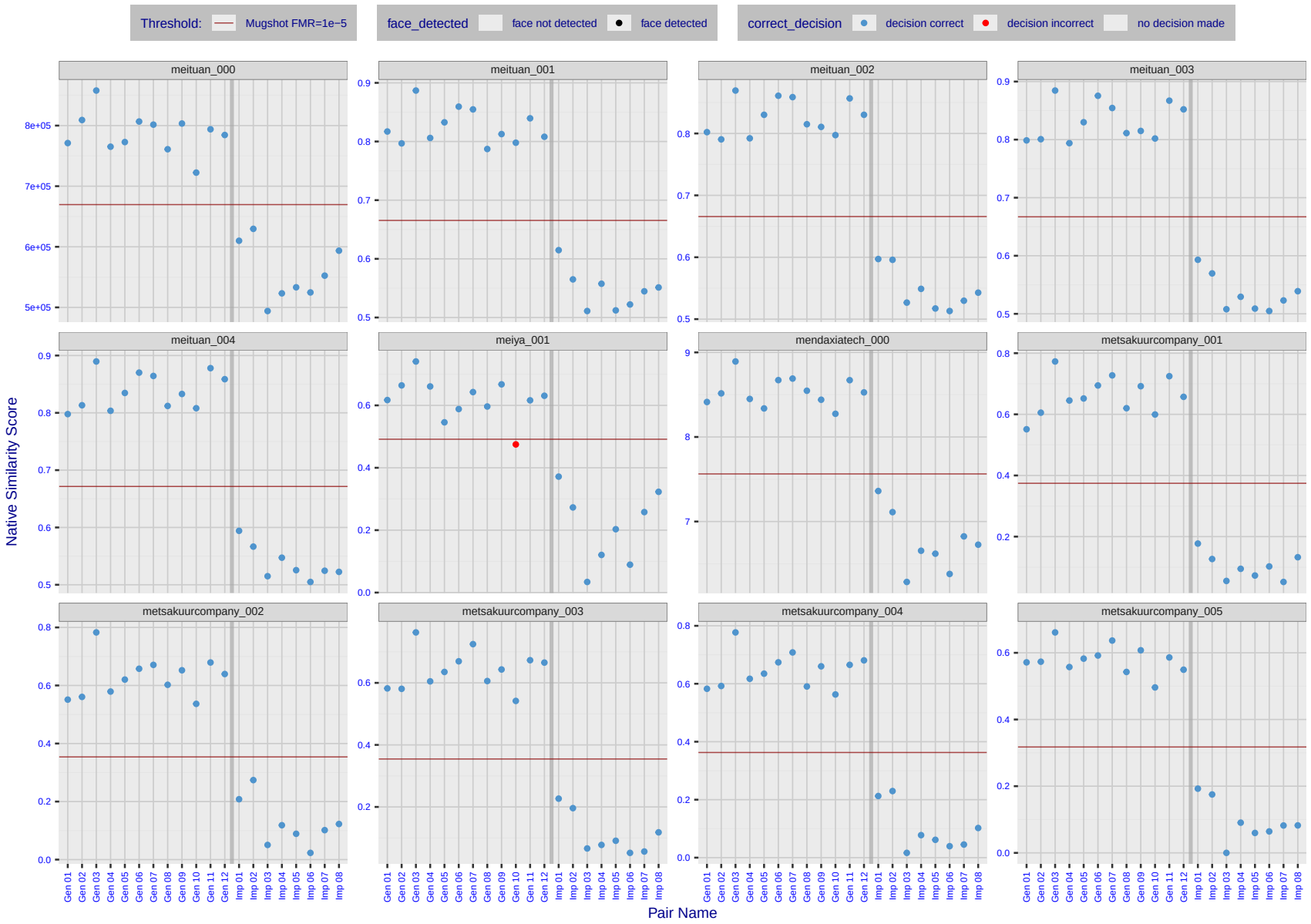

Figure 56: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

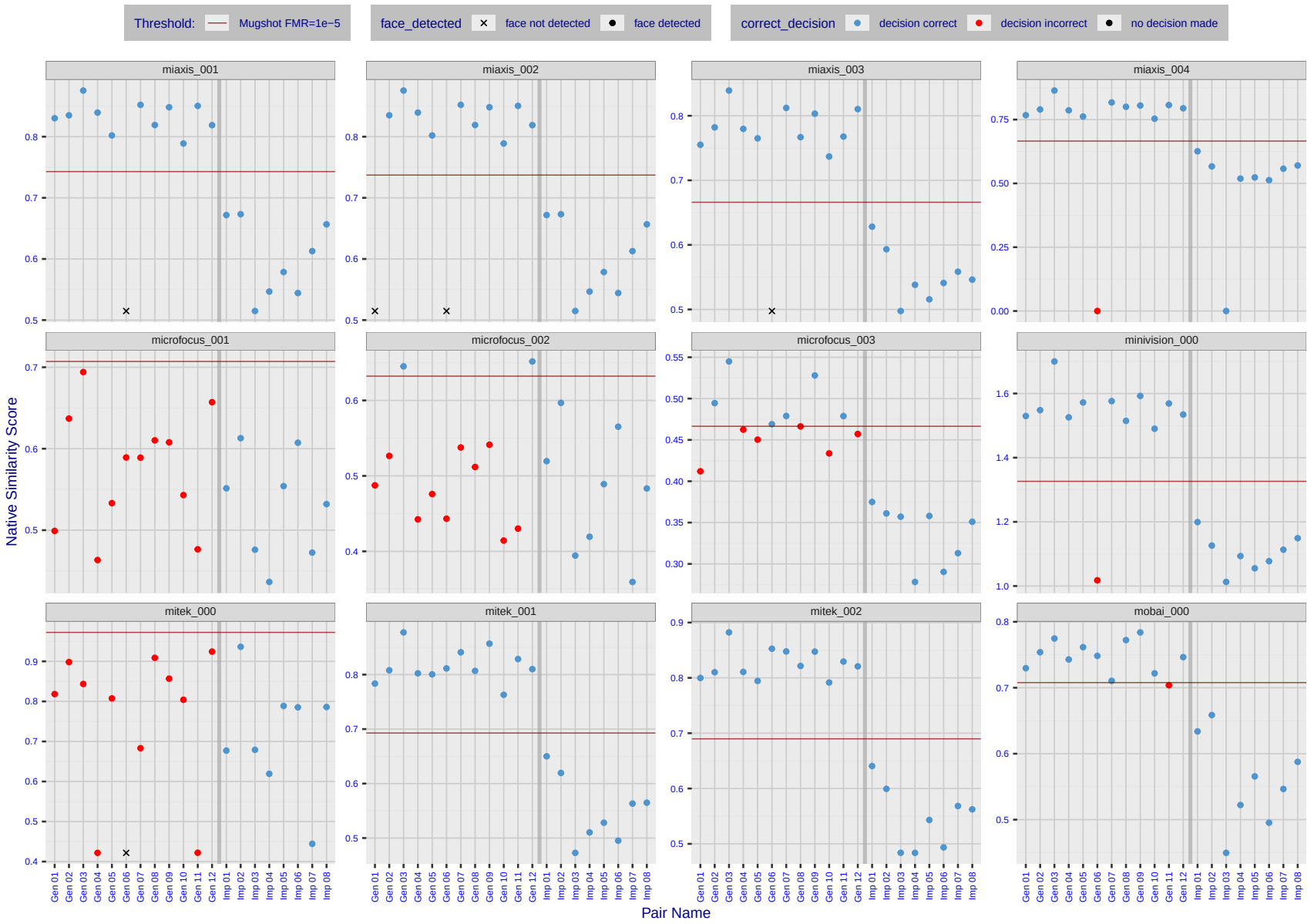

Figure 57: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

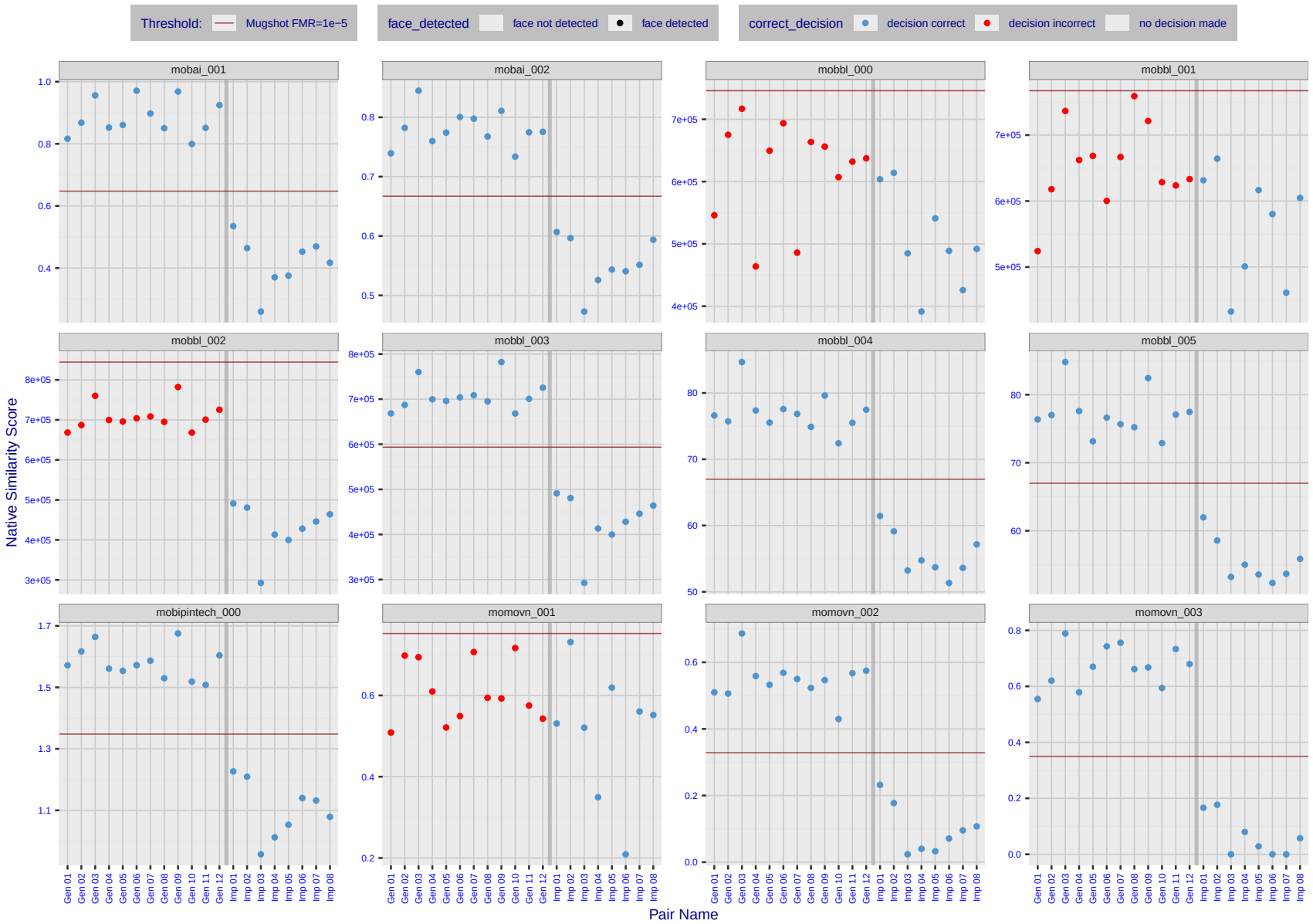

Figure 58: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

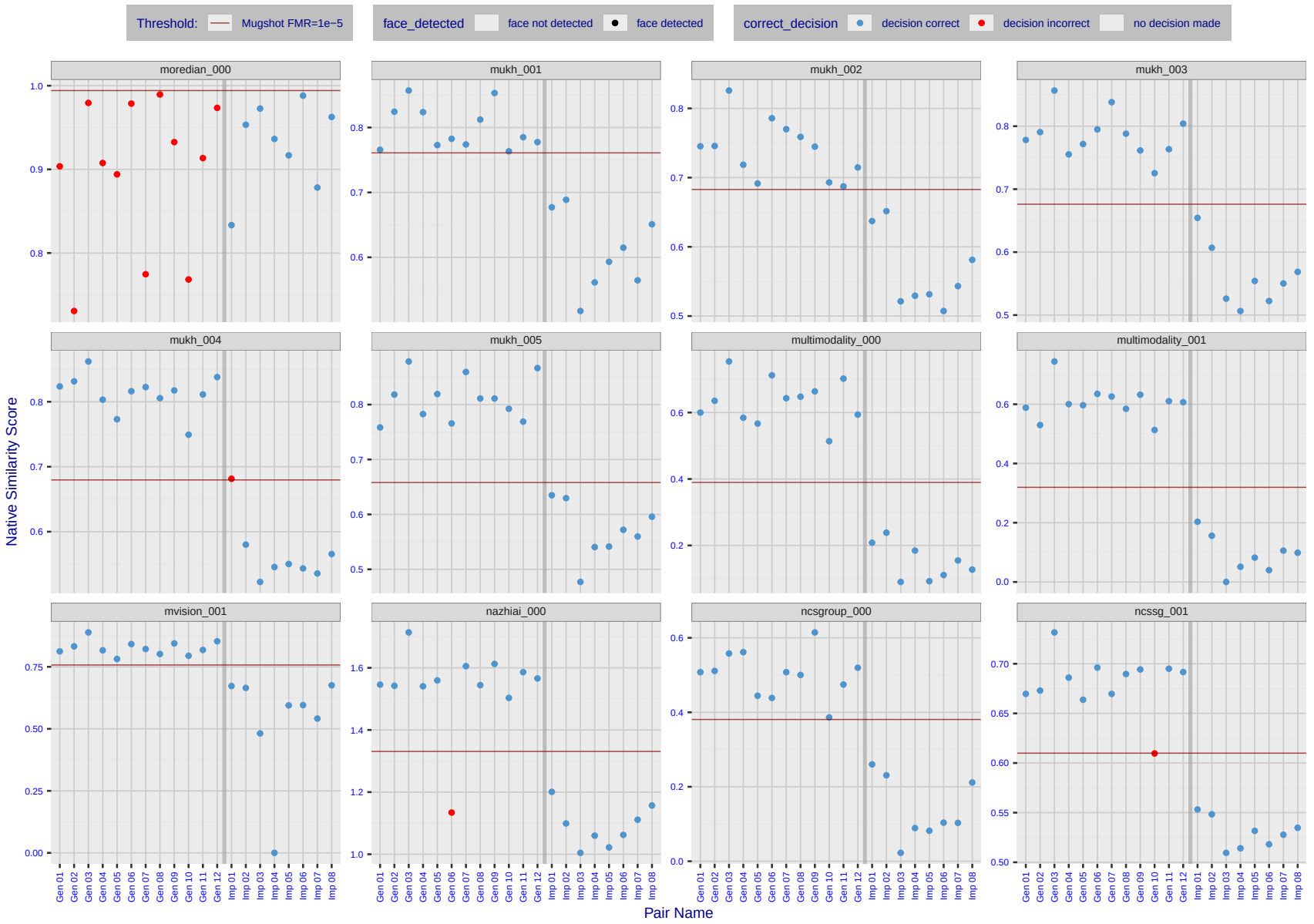

Figure 59: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

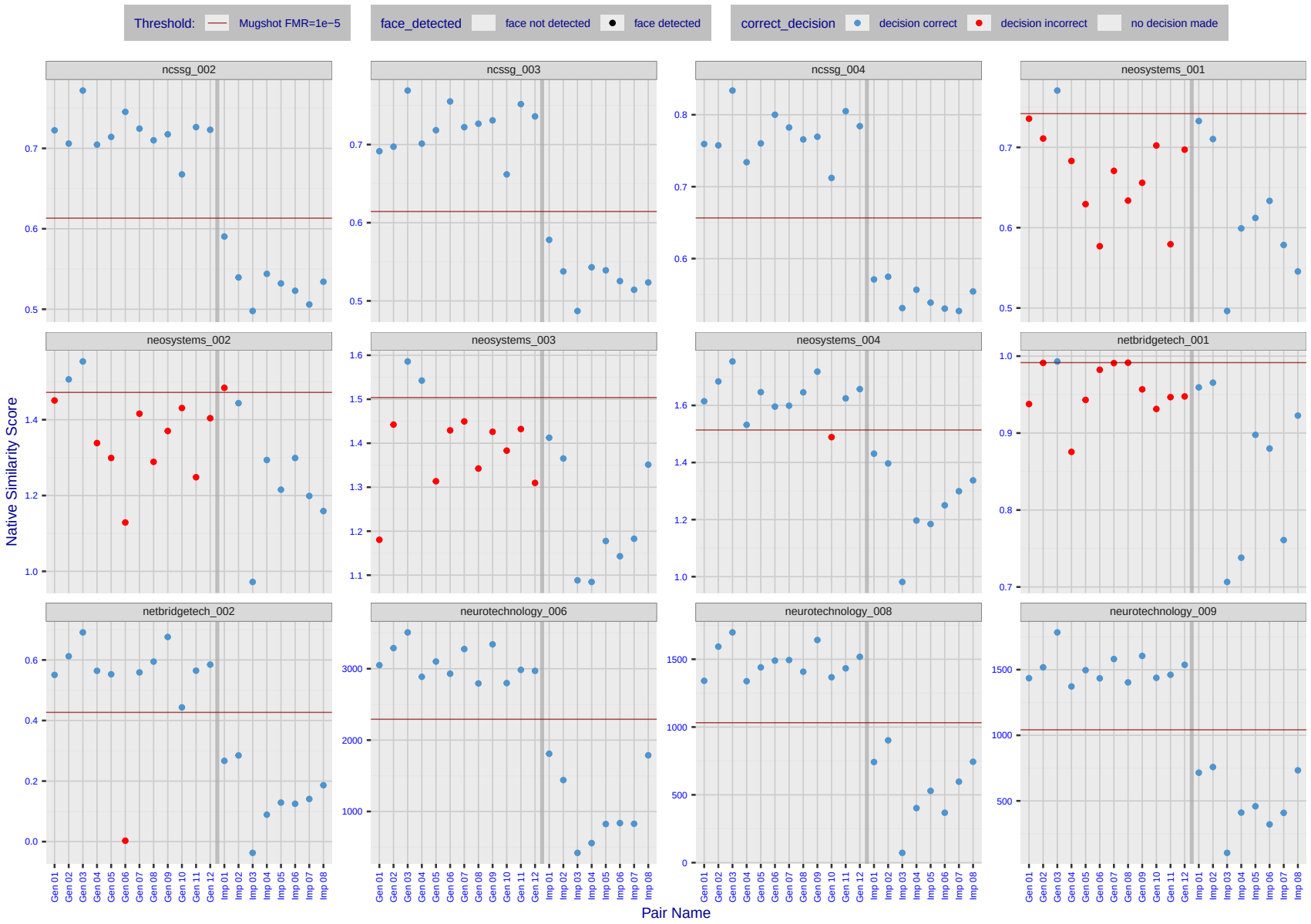

Figure 60: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

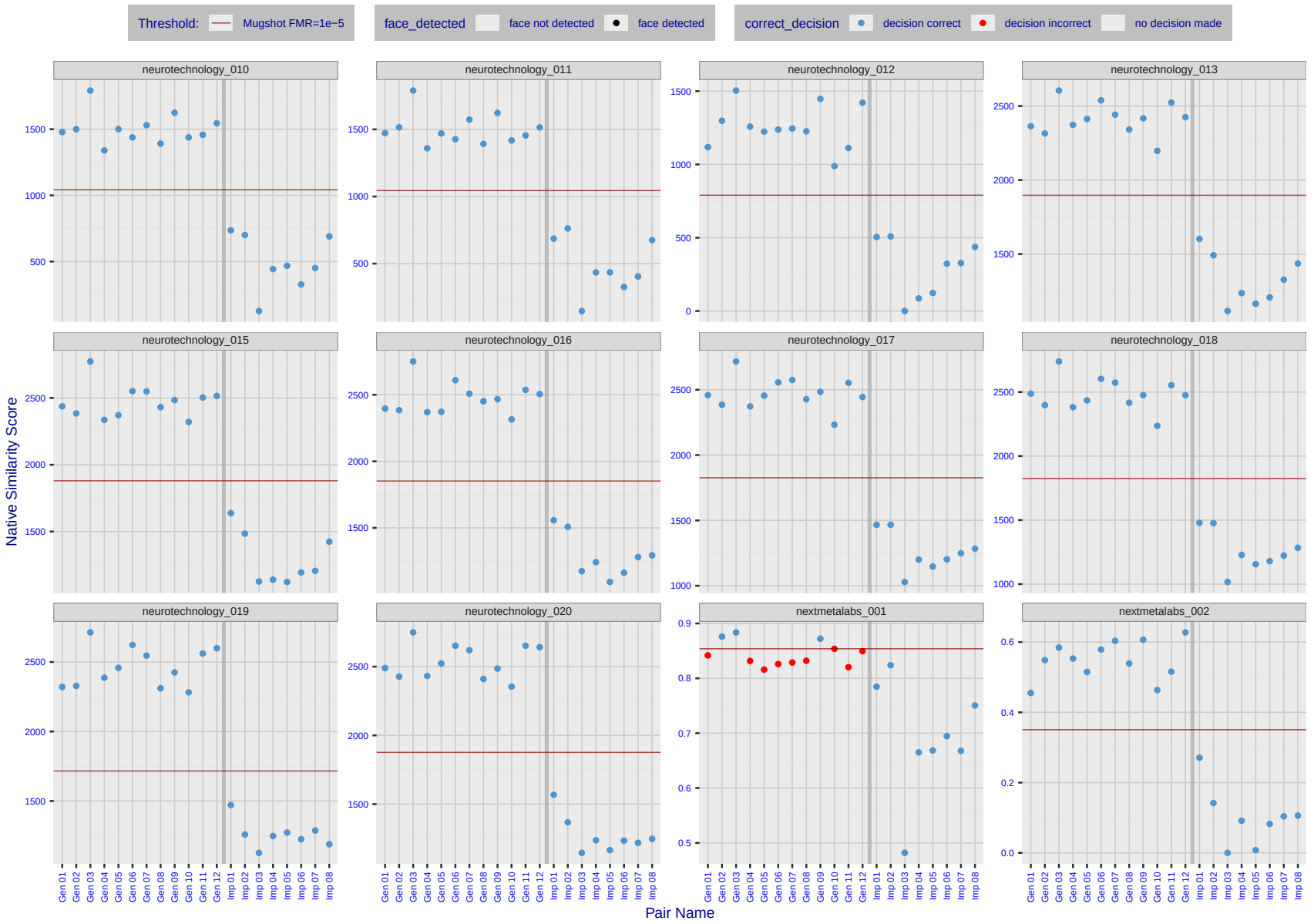

Figure 61: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

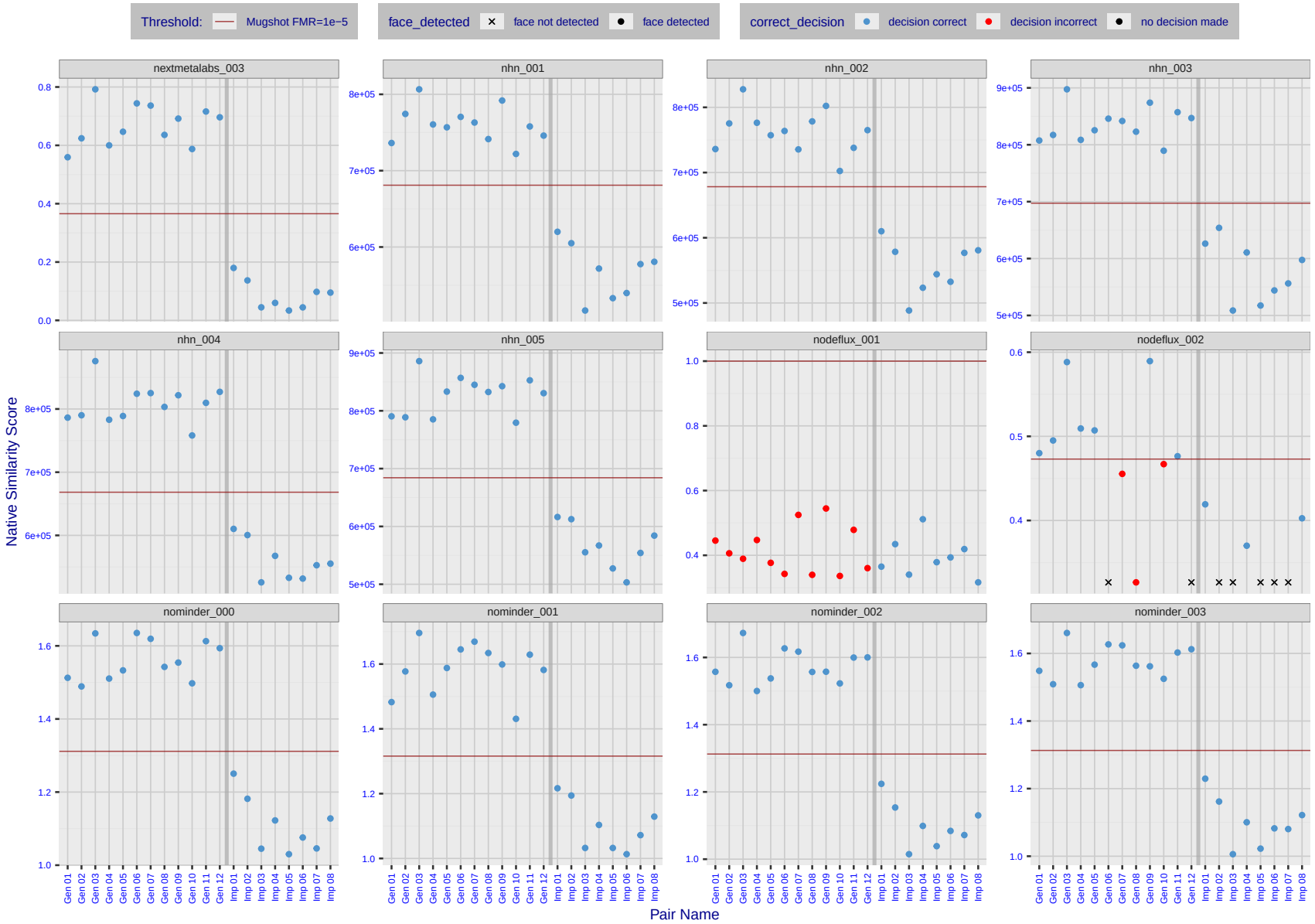

Figure 62: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

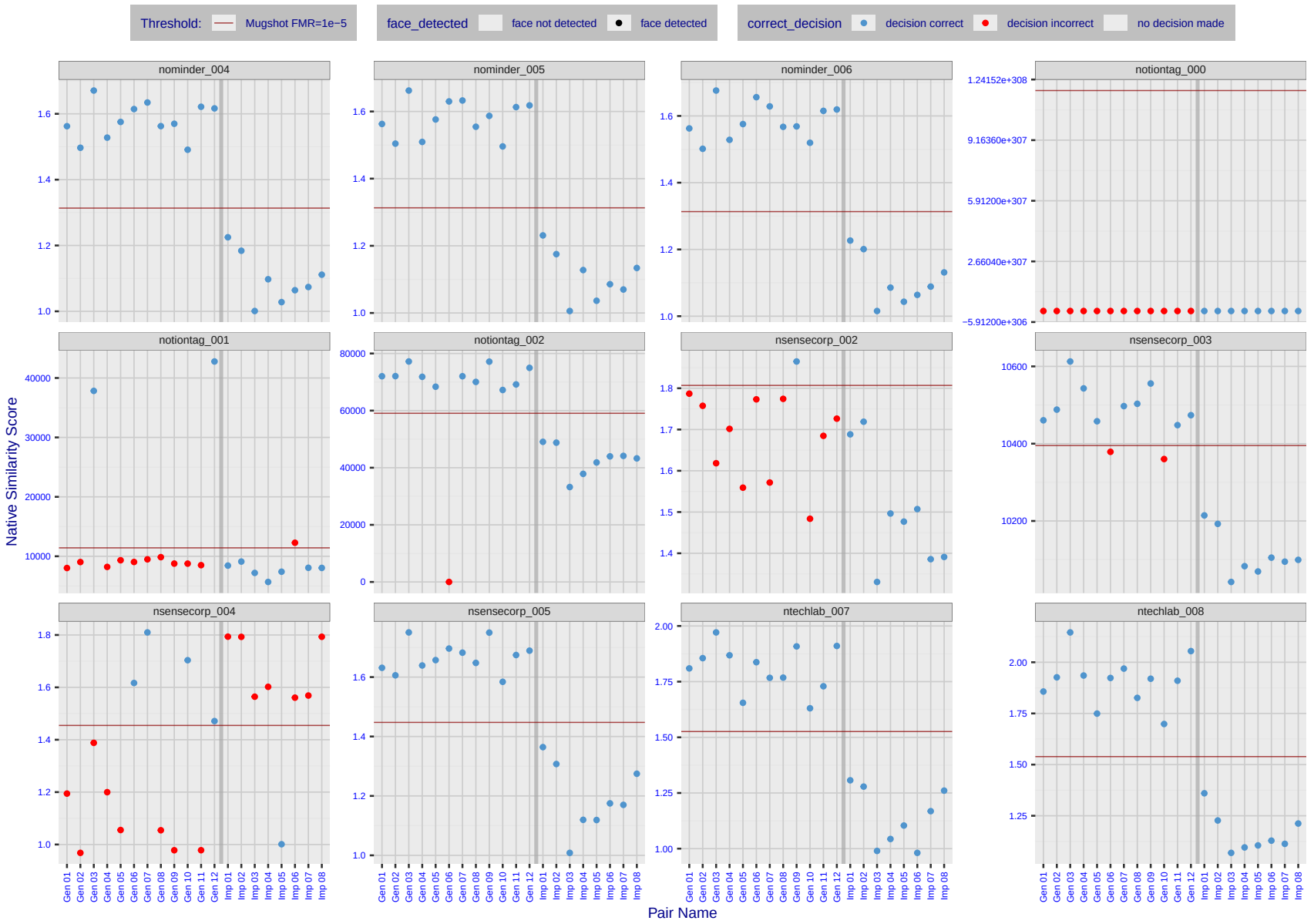

Figure 63: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

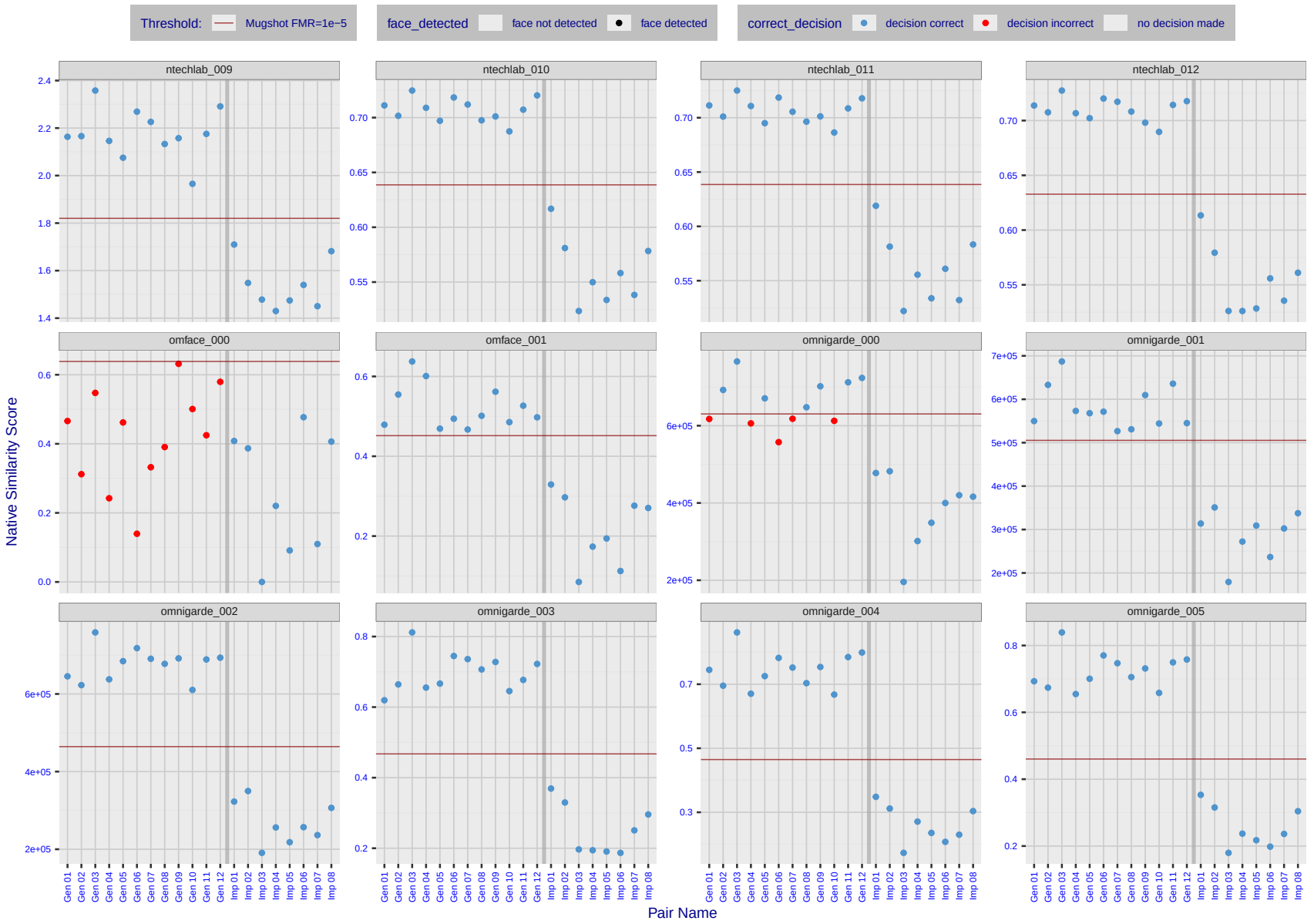

Figure 64: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

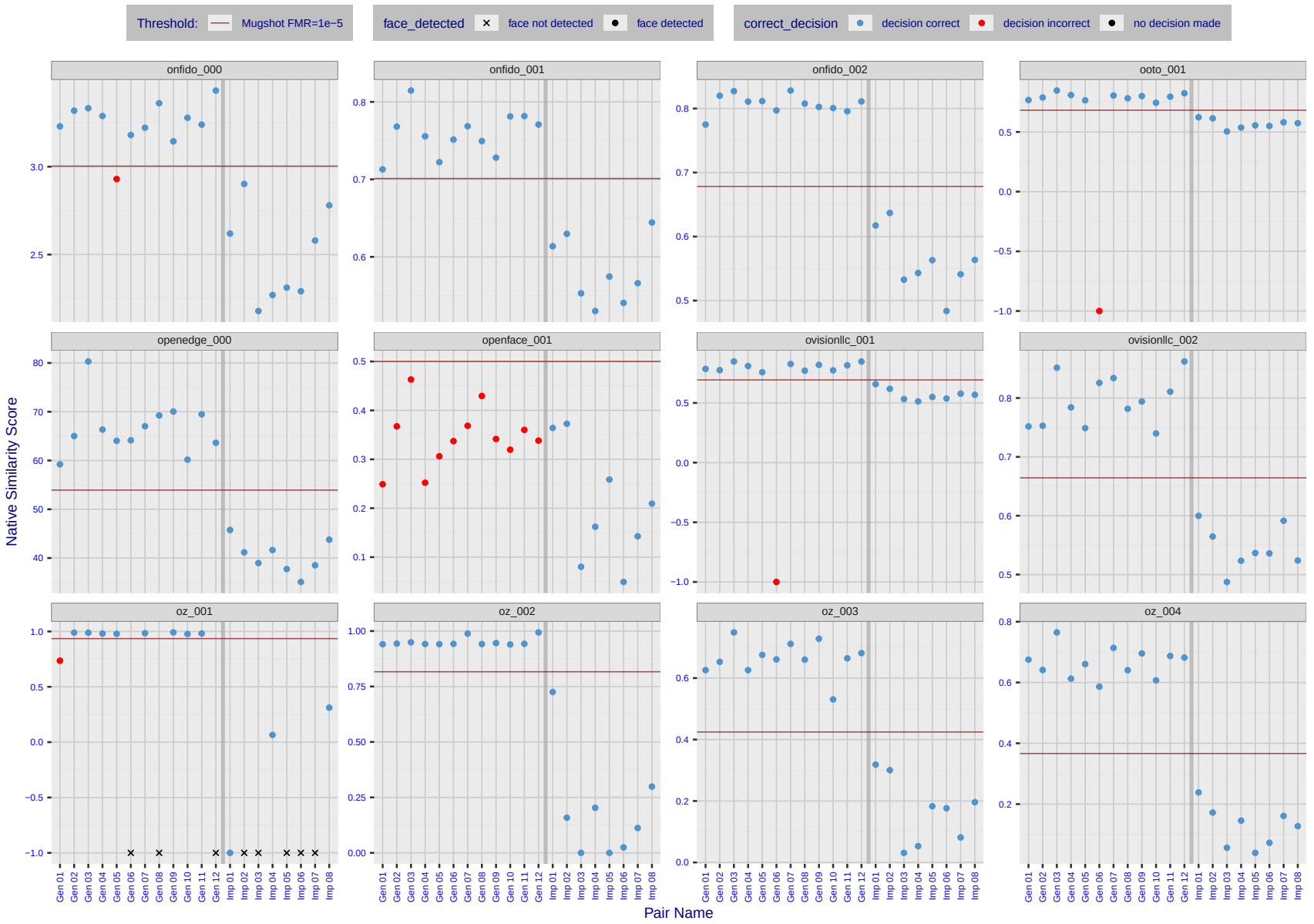

Figure 65: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

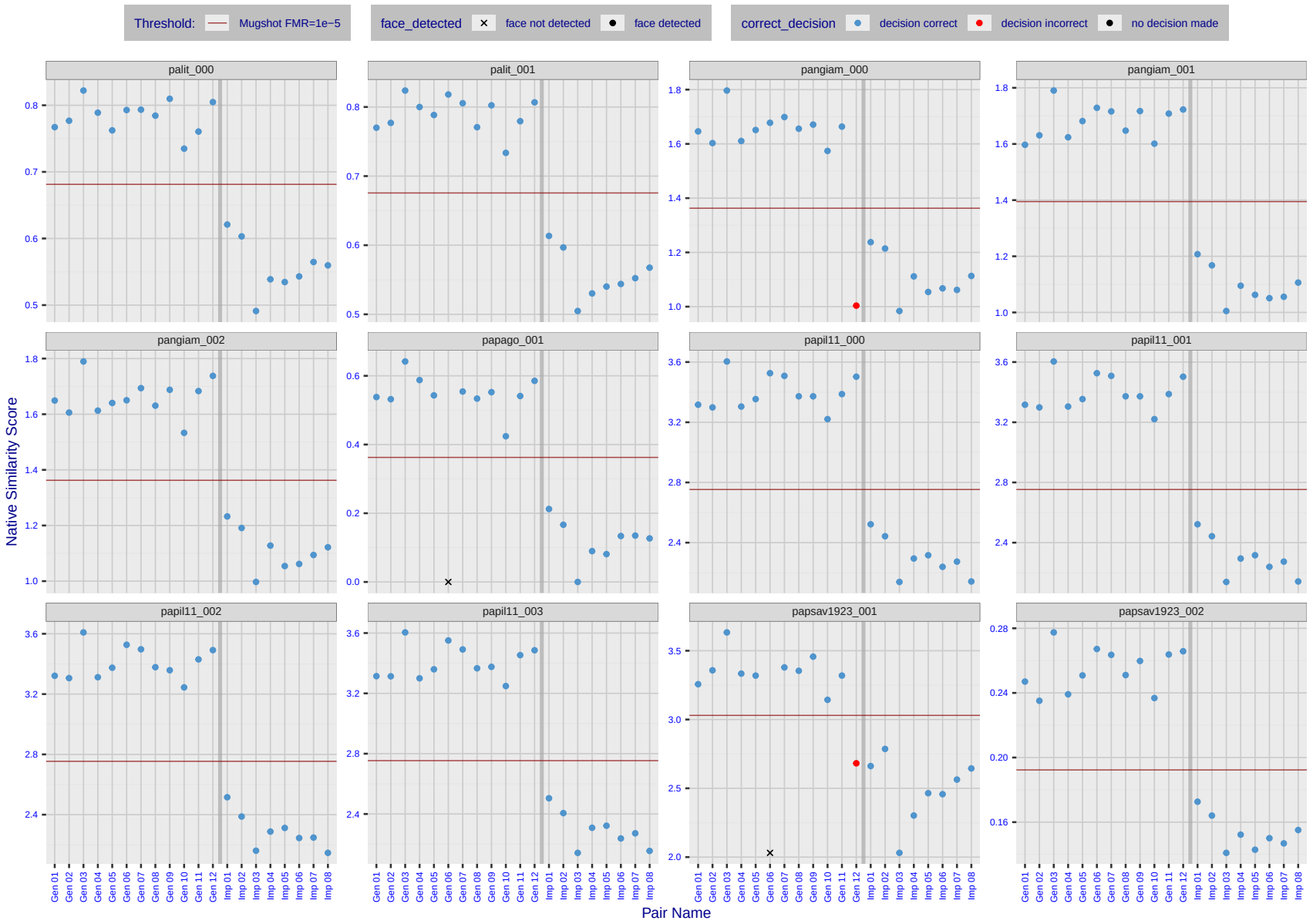

Figure 66: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

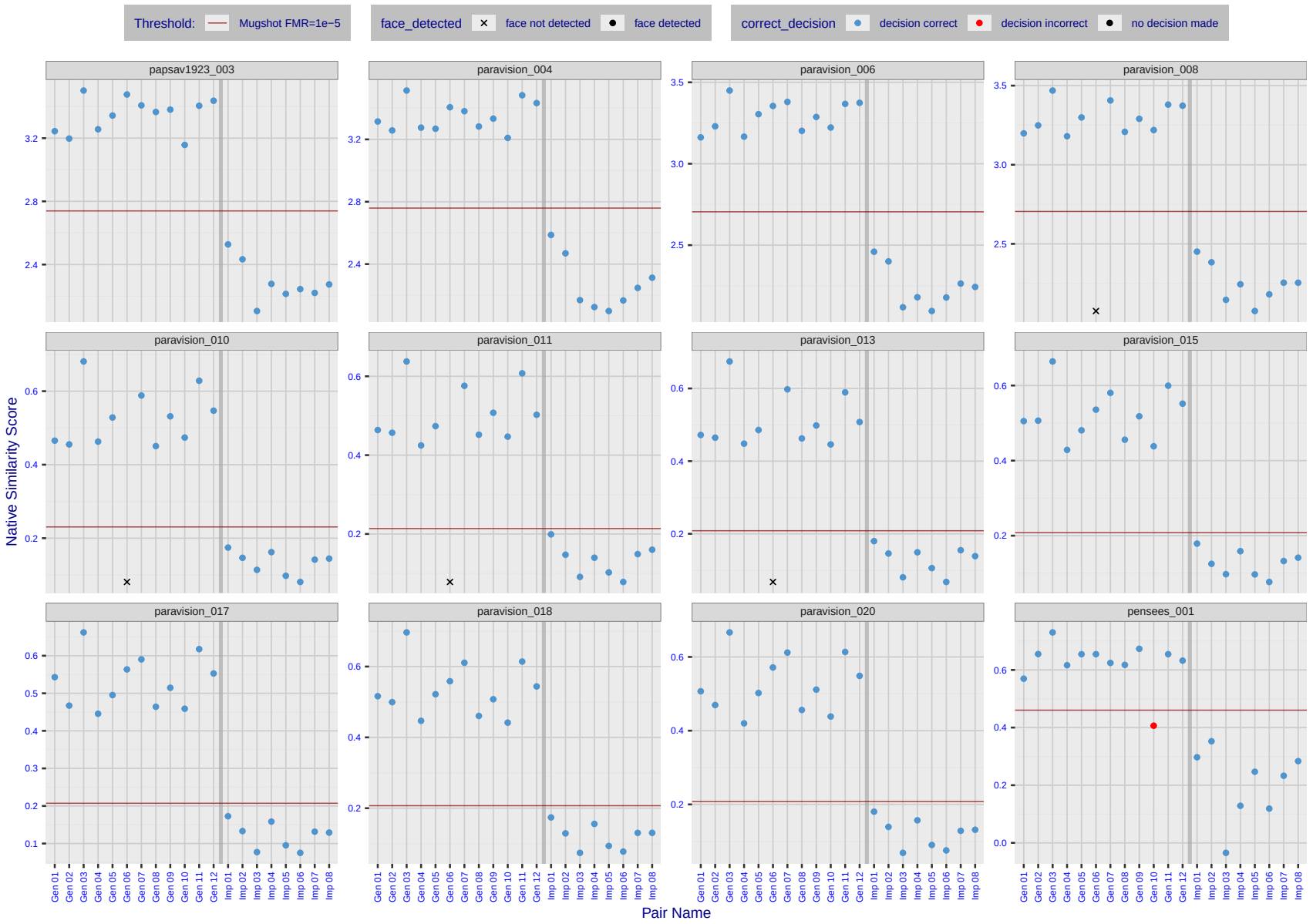

Figure 67: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

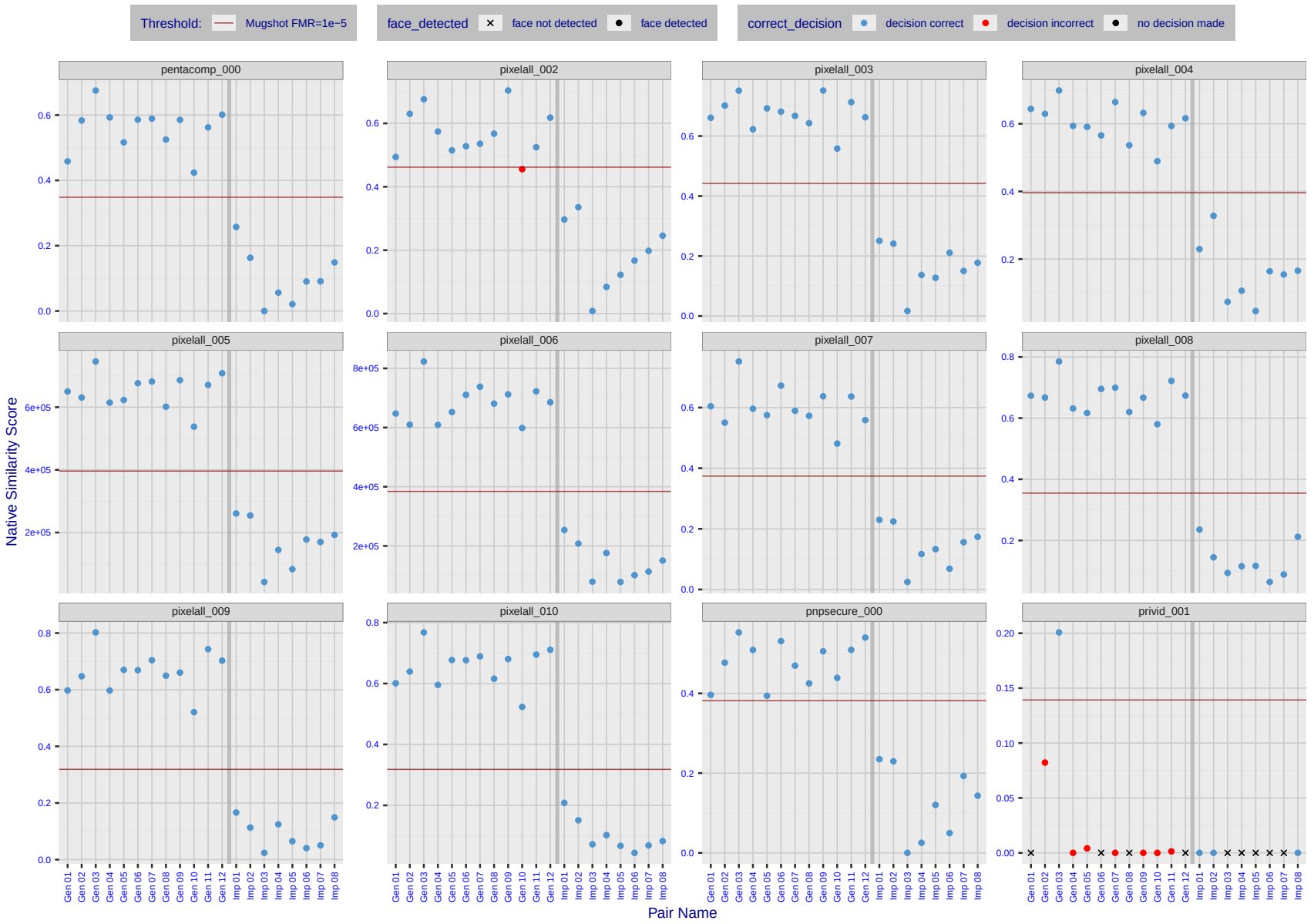

Figure 68: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

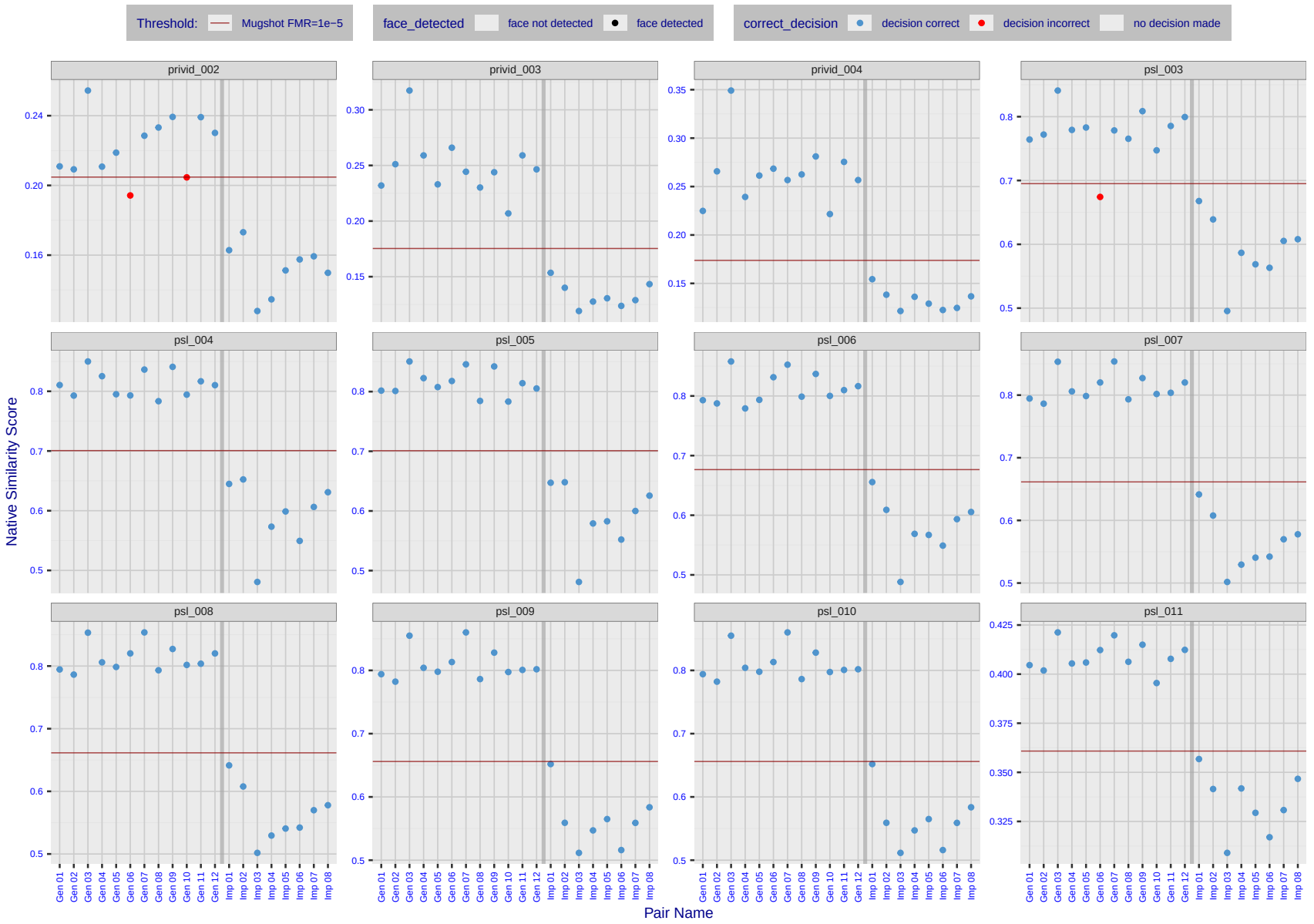

Figure 69: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

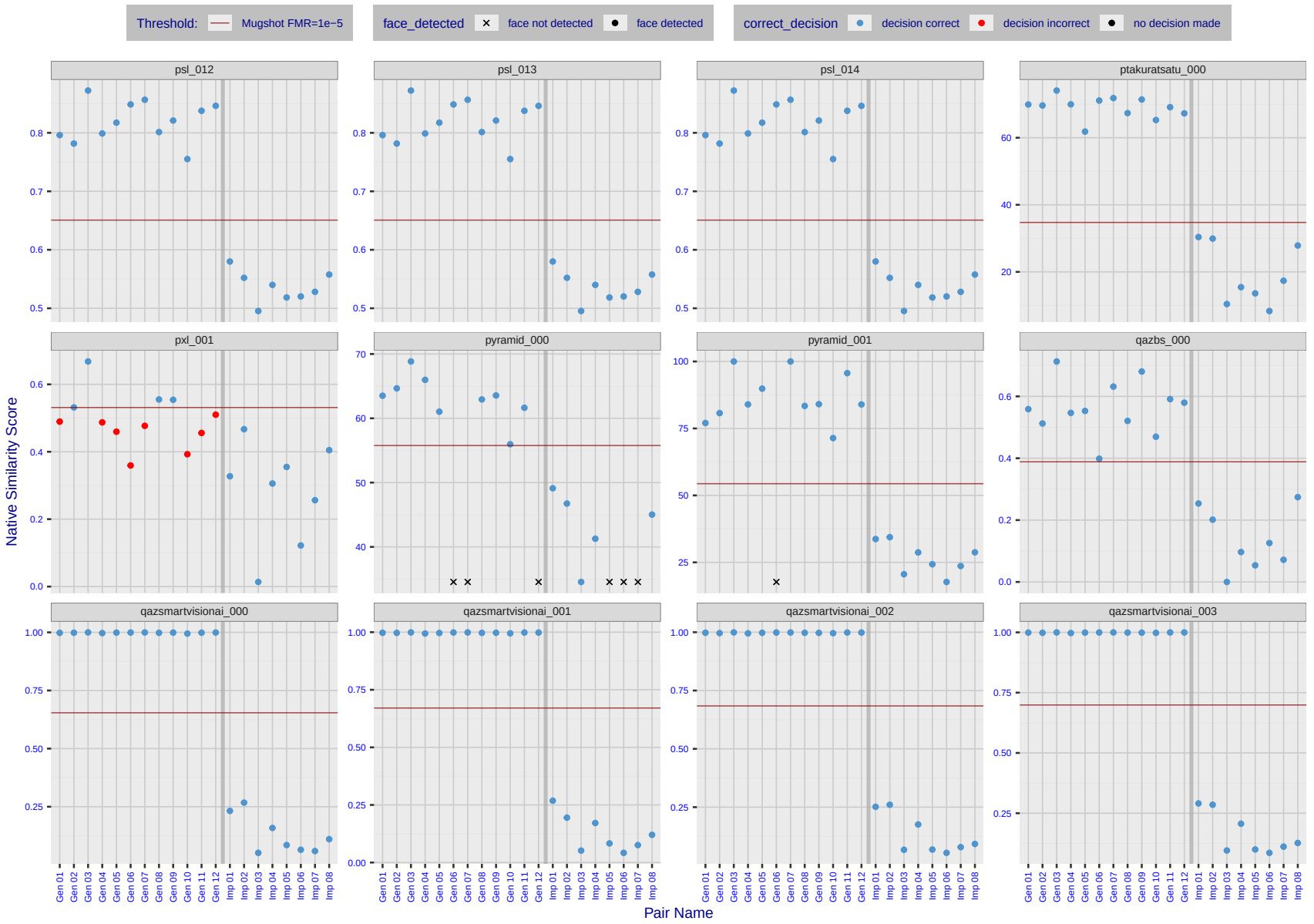

Figure 70: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

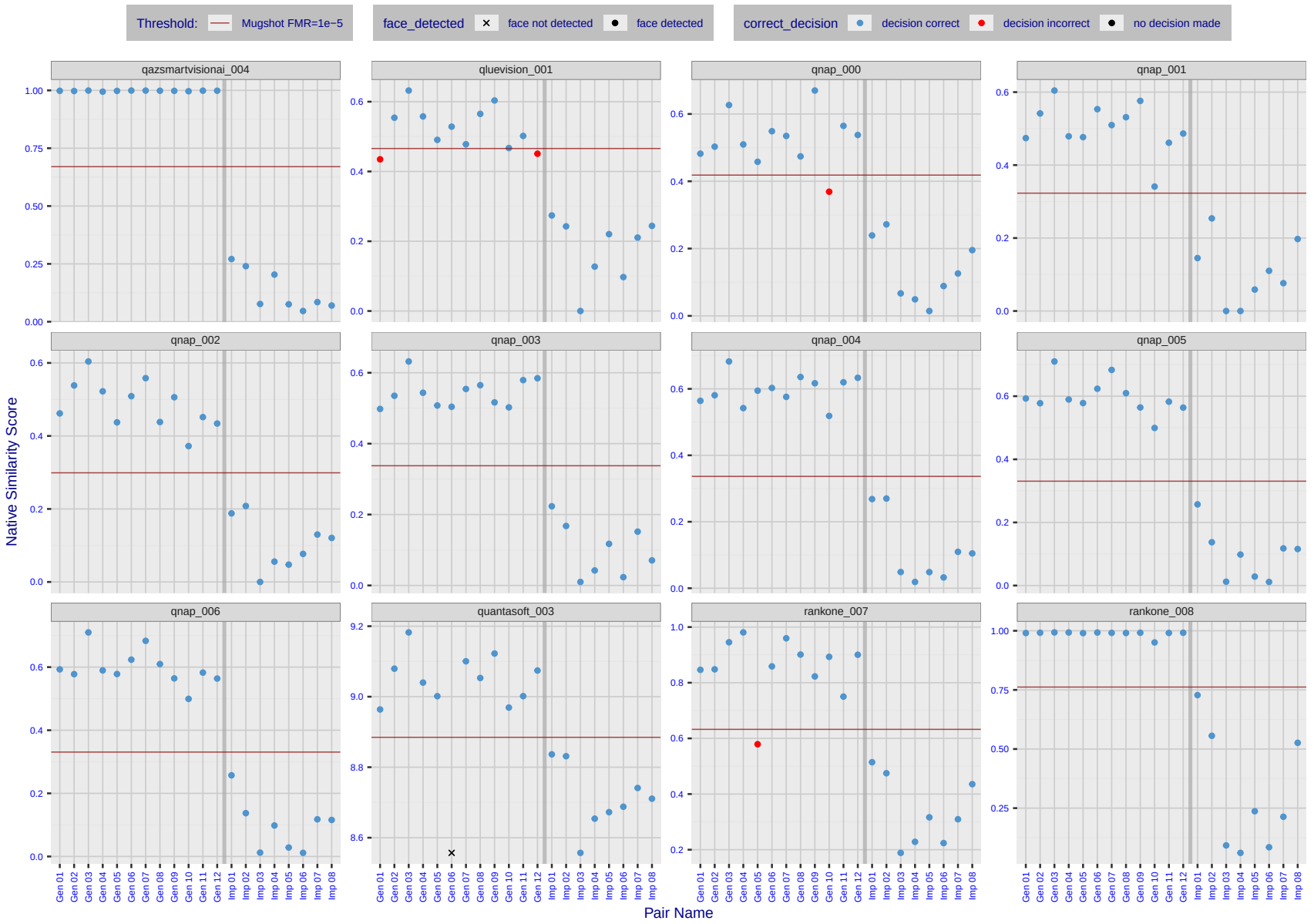

Figure 71: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

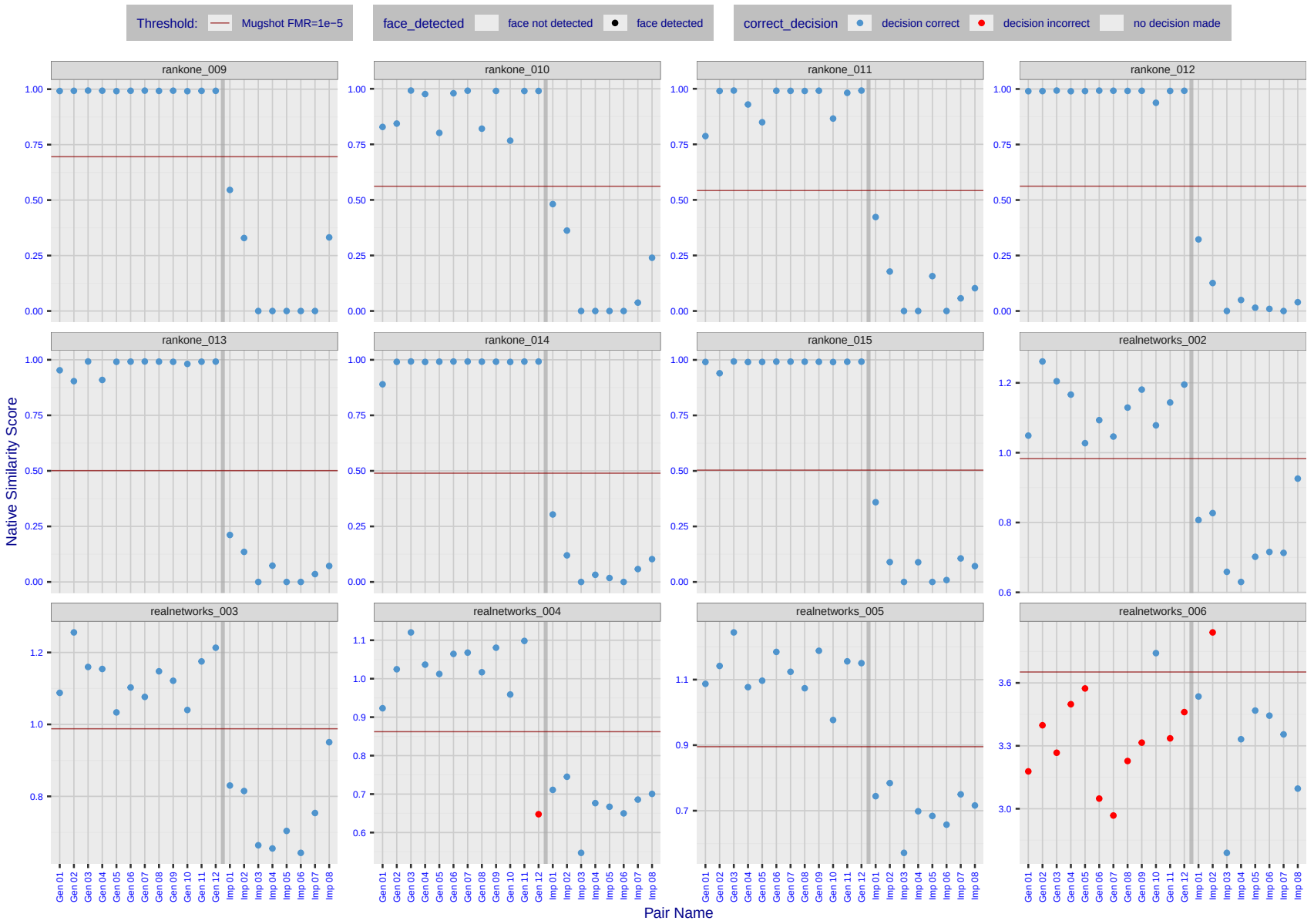

Figure 72: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

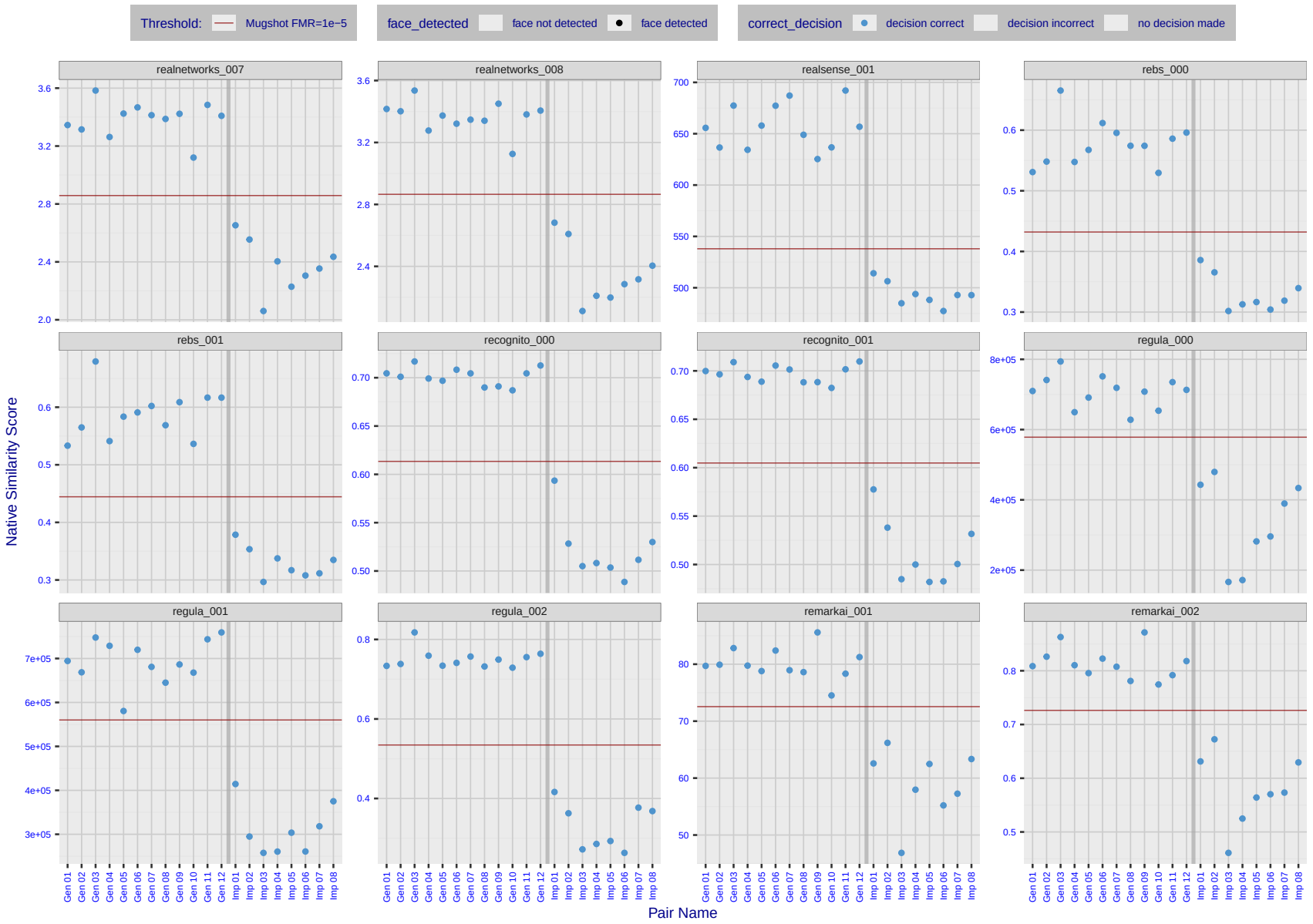

Figure 73: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

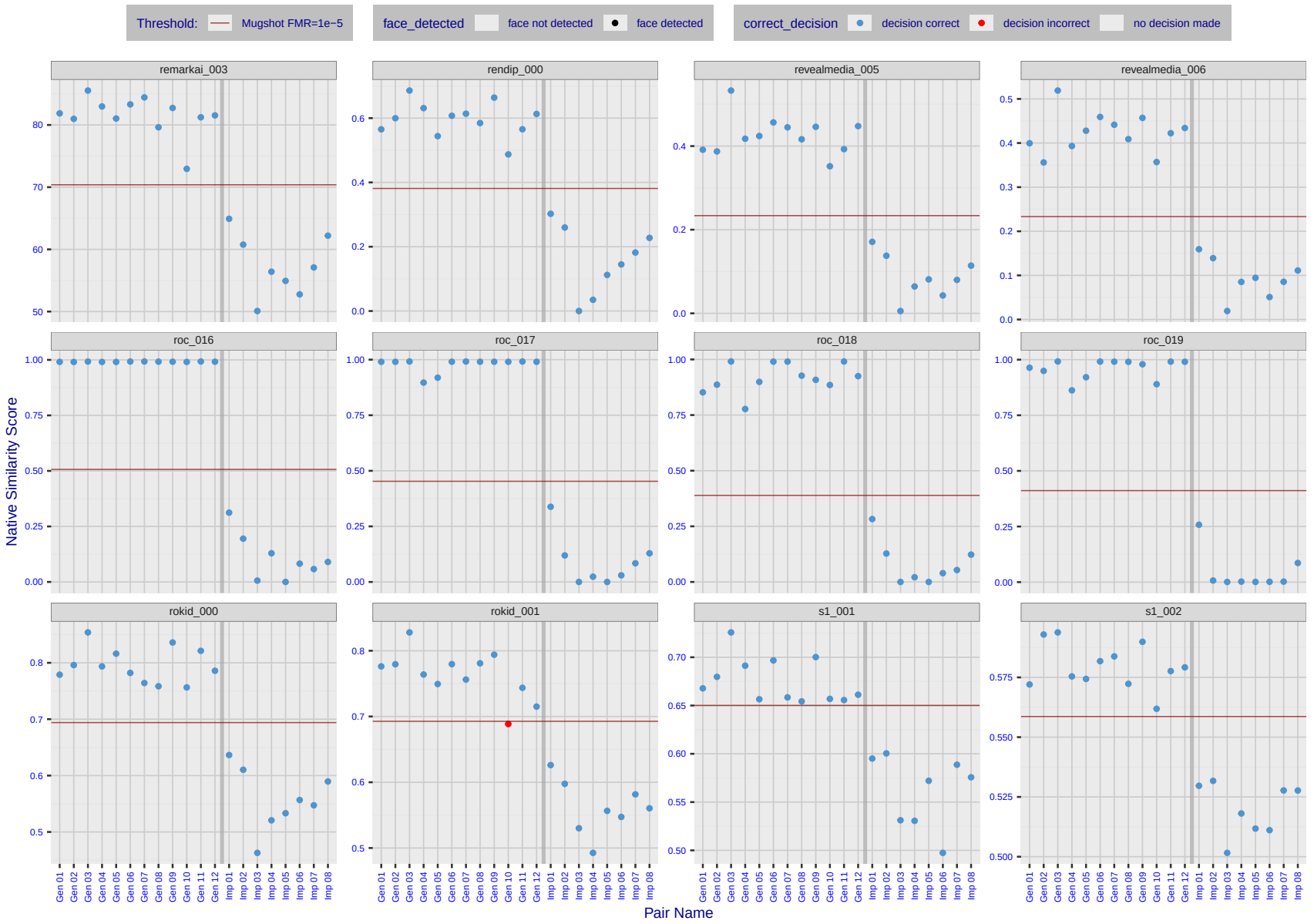

Figure 74: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

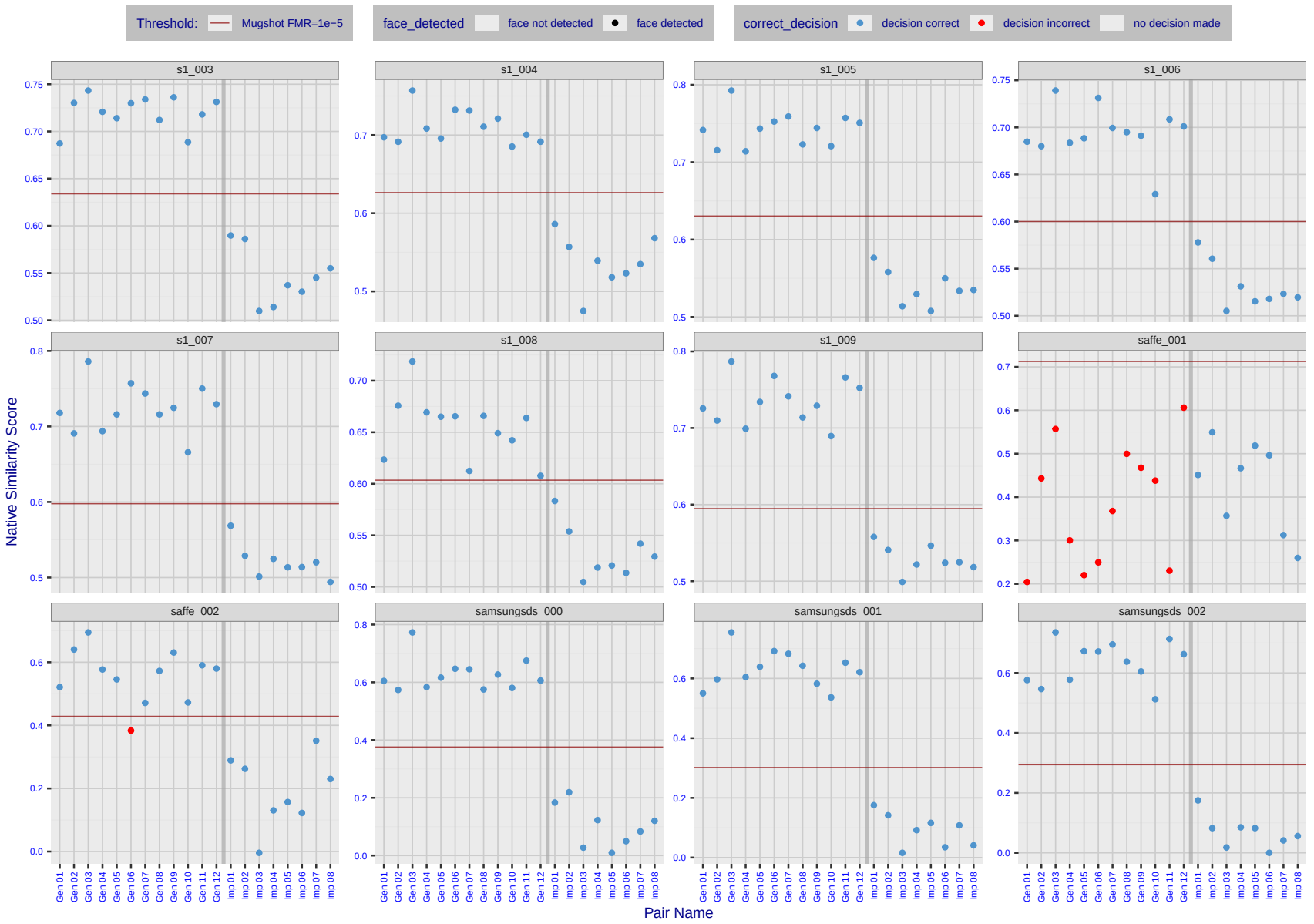

Figure 75: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

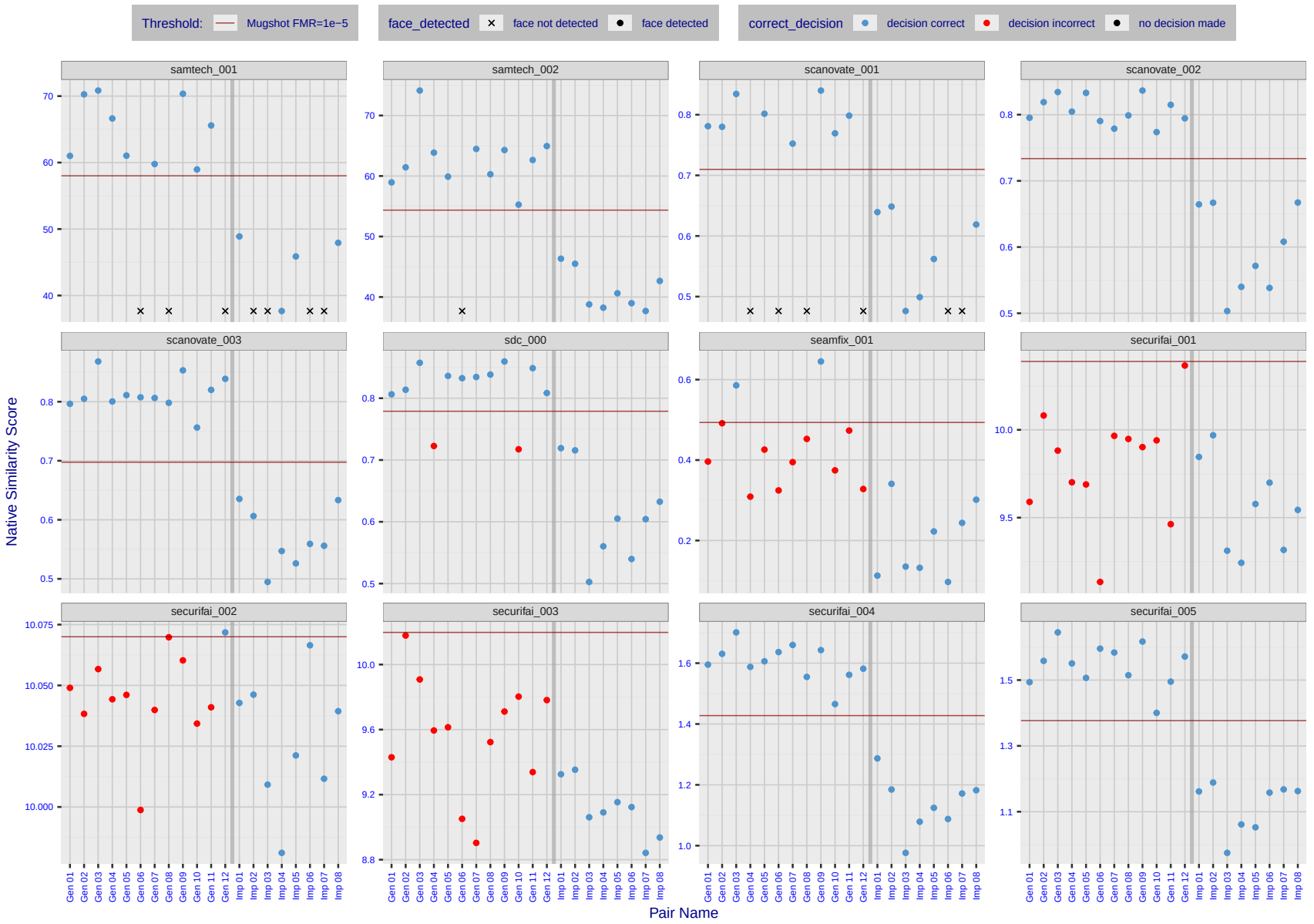

Figure 76: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

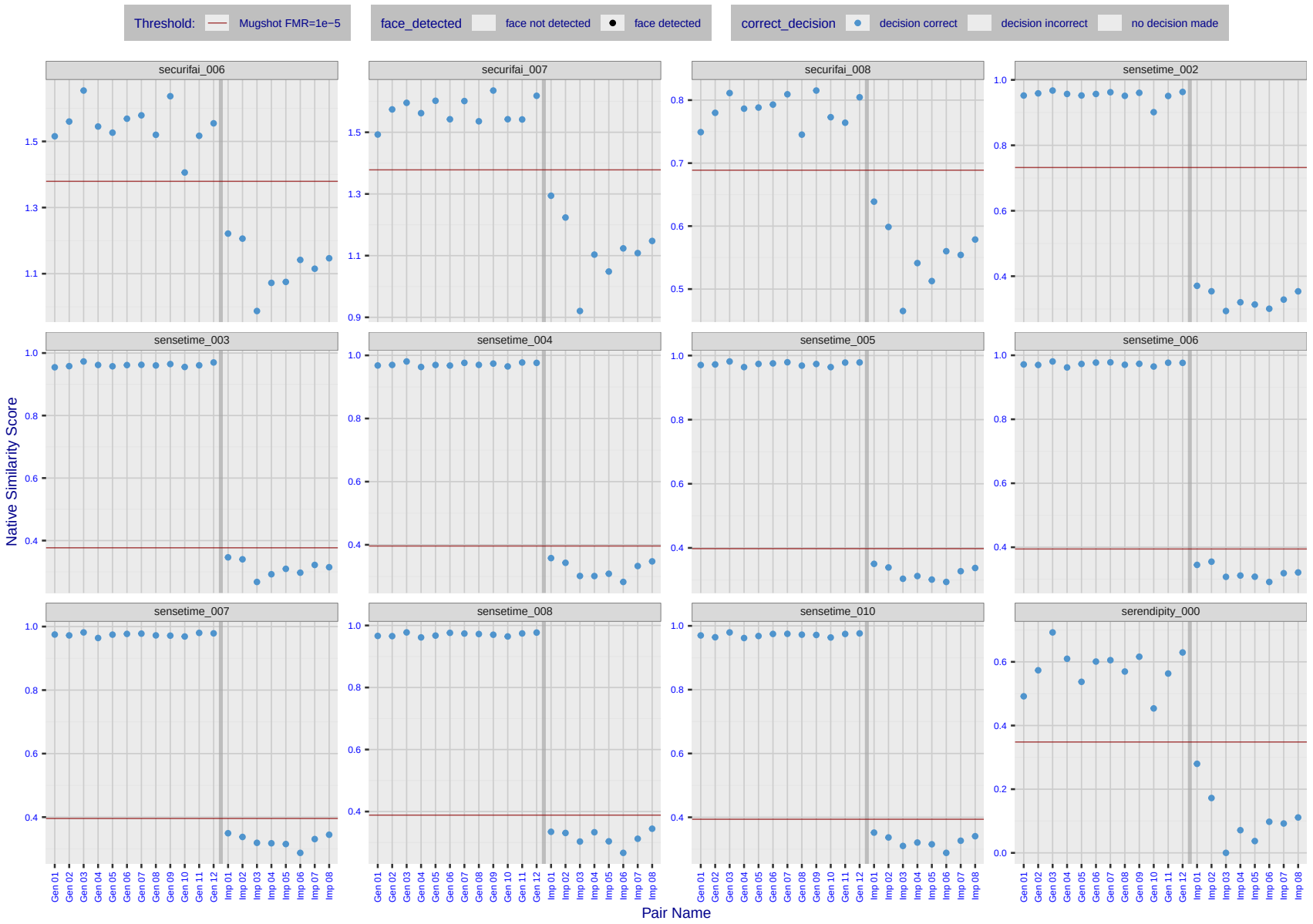

Figure 77: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

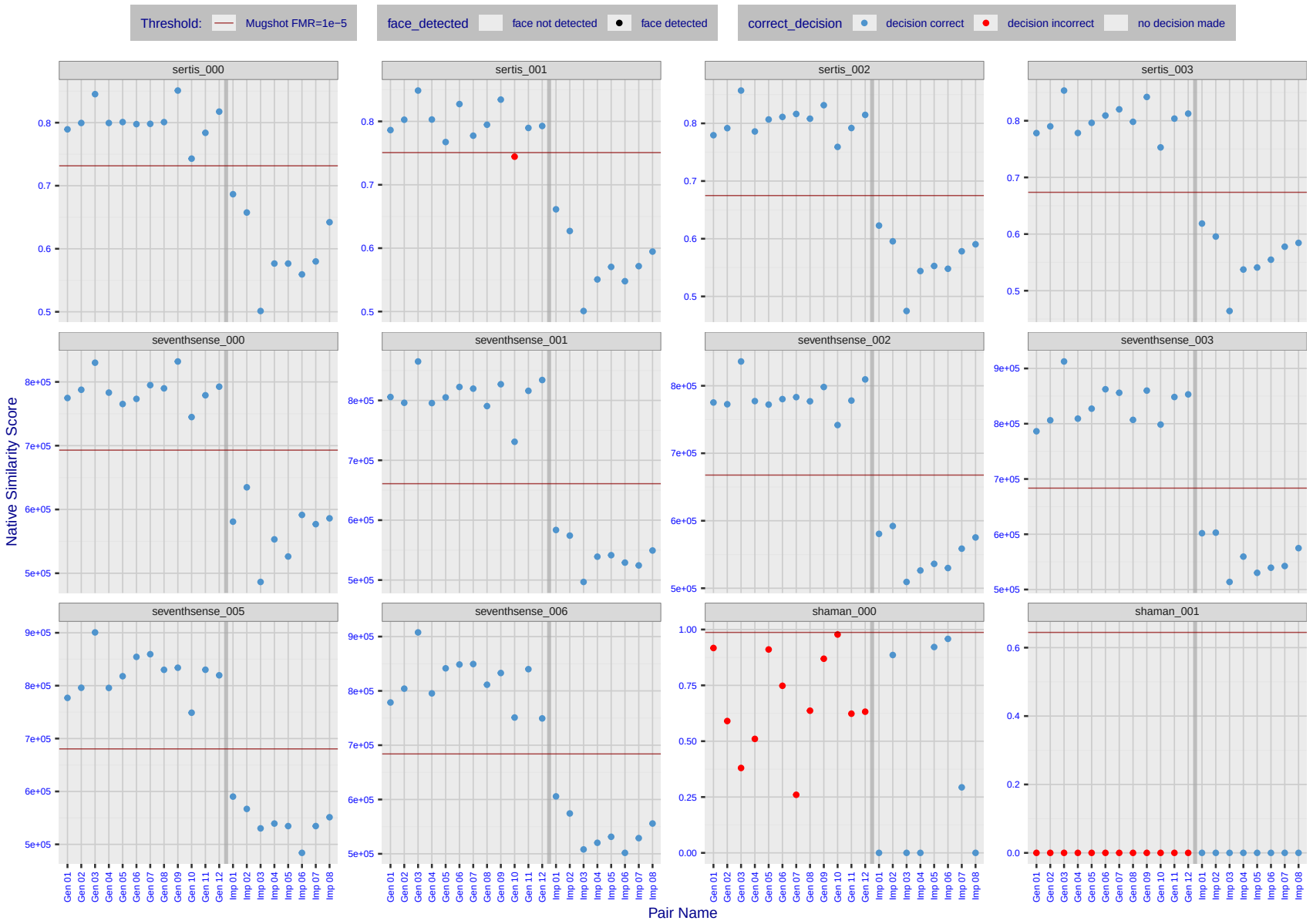

Figure 78: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

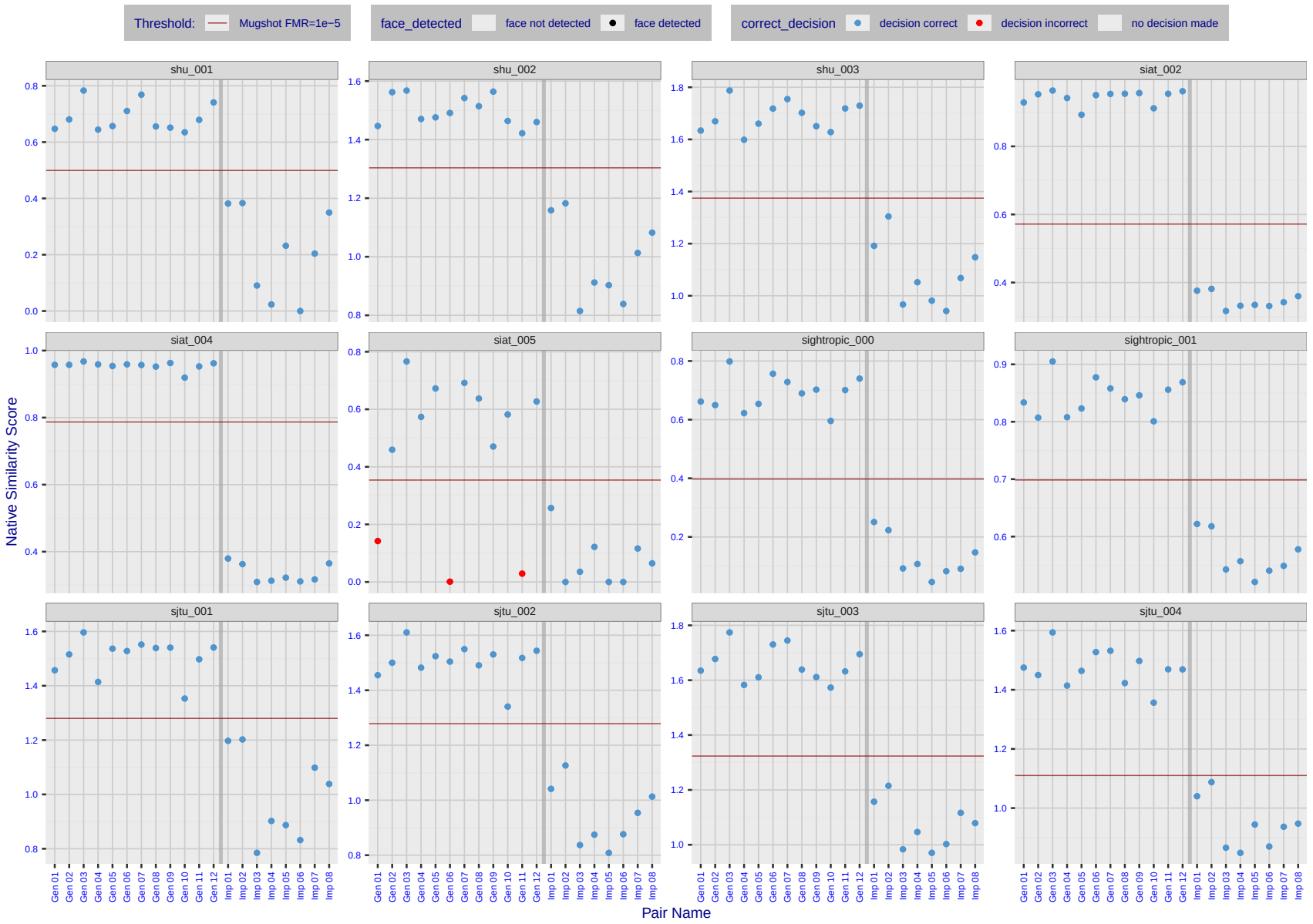

Figure 79: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

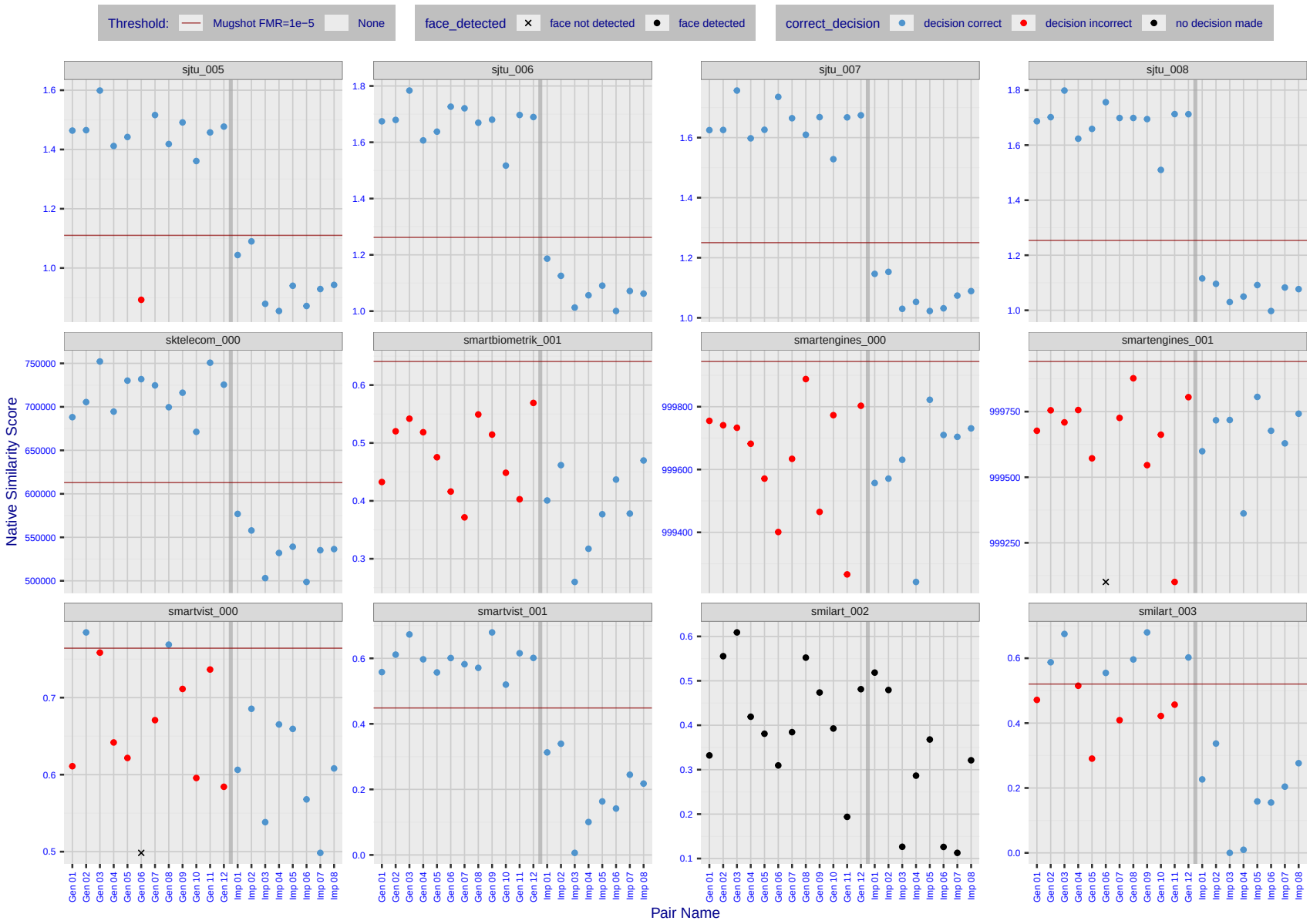

Figure 80: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

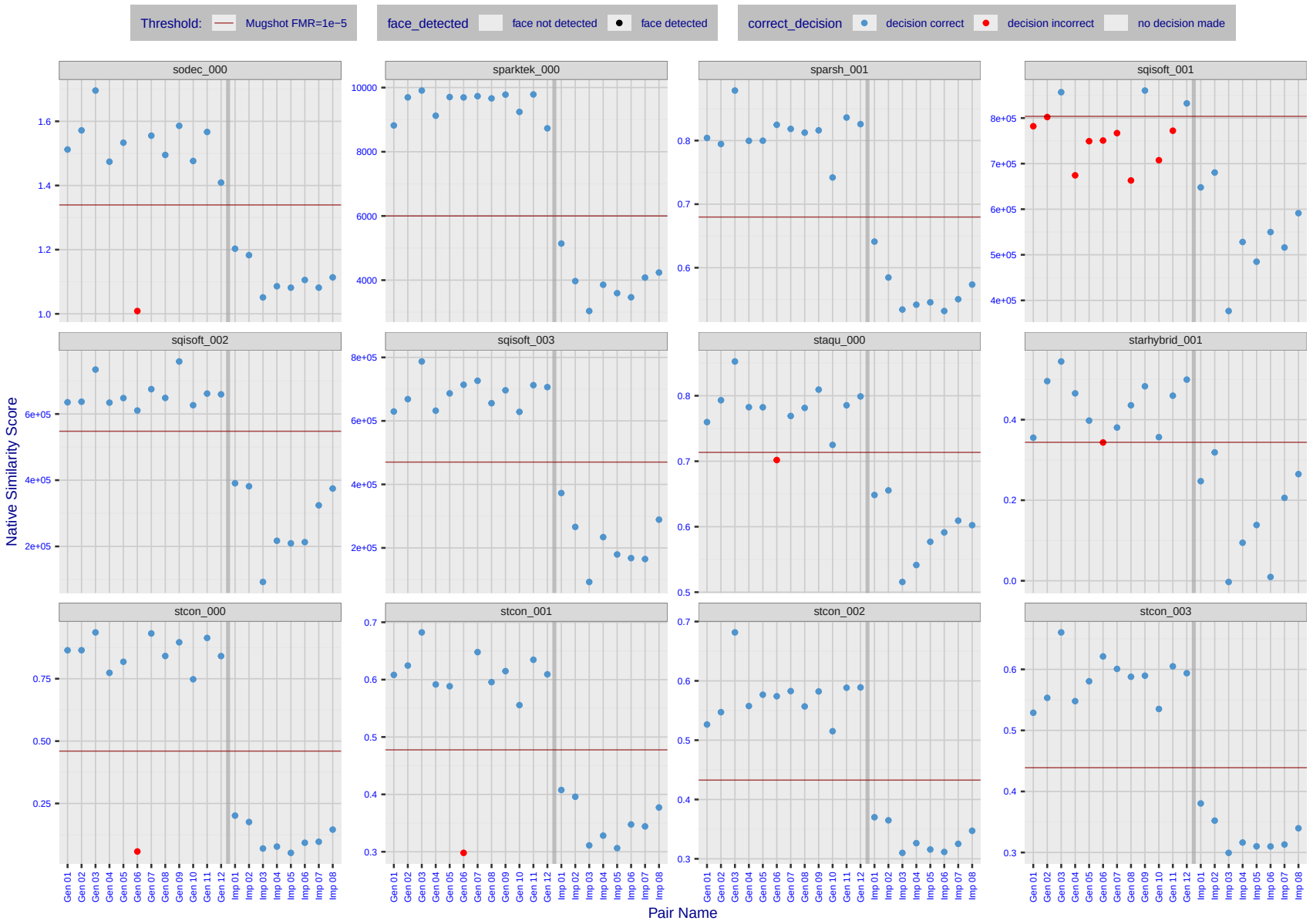

Figure 81: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

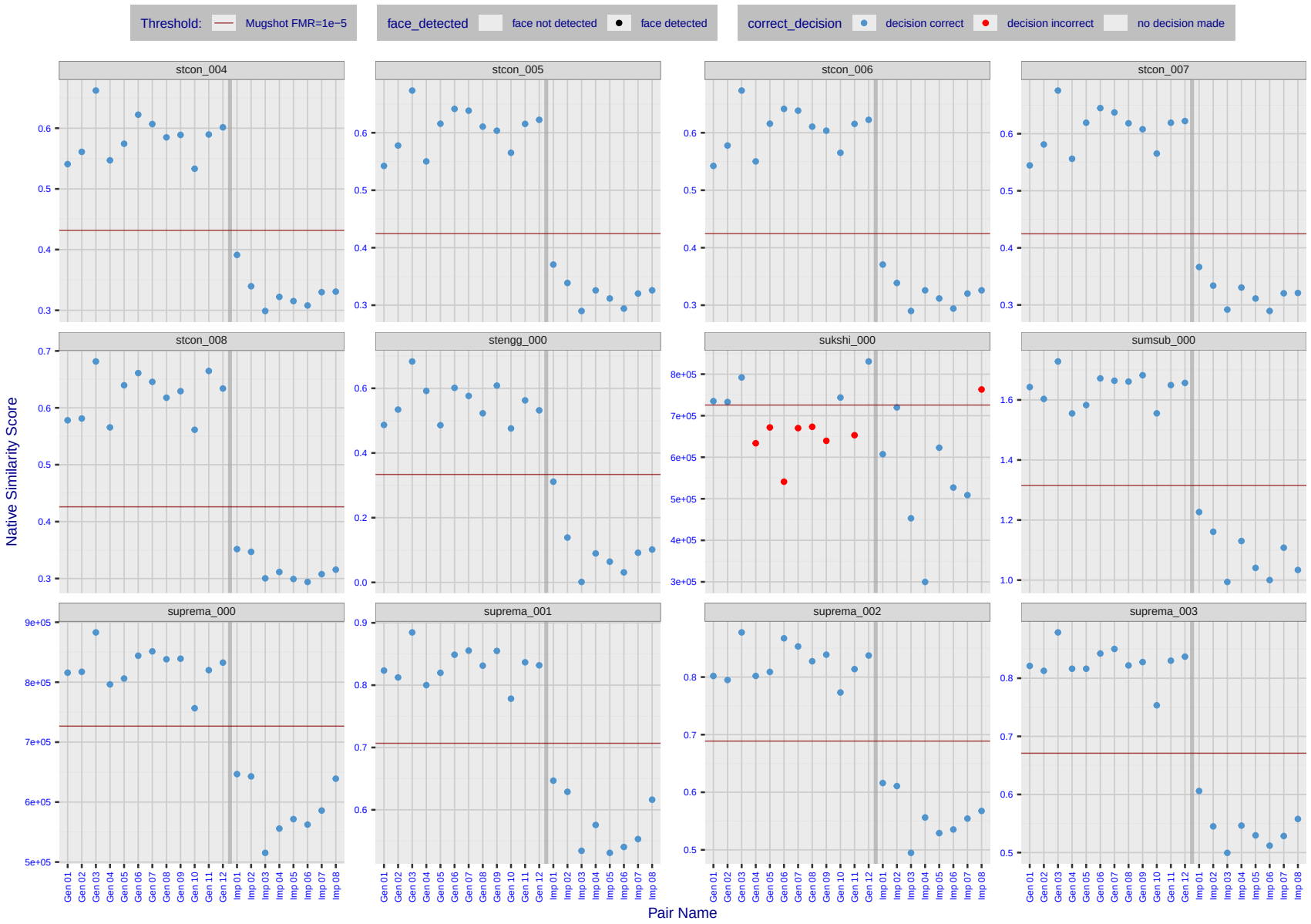

Figure 82: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

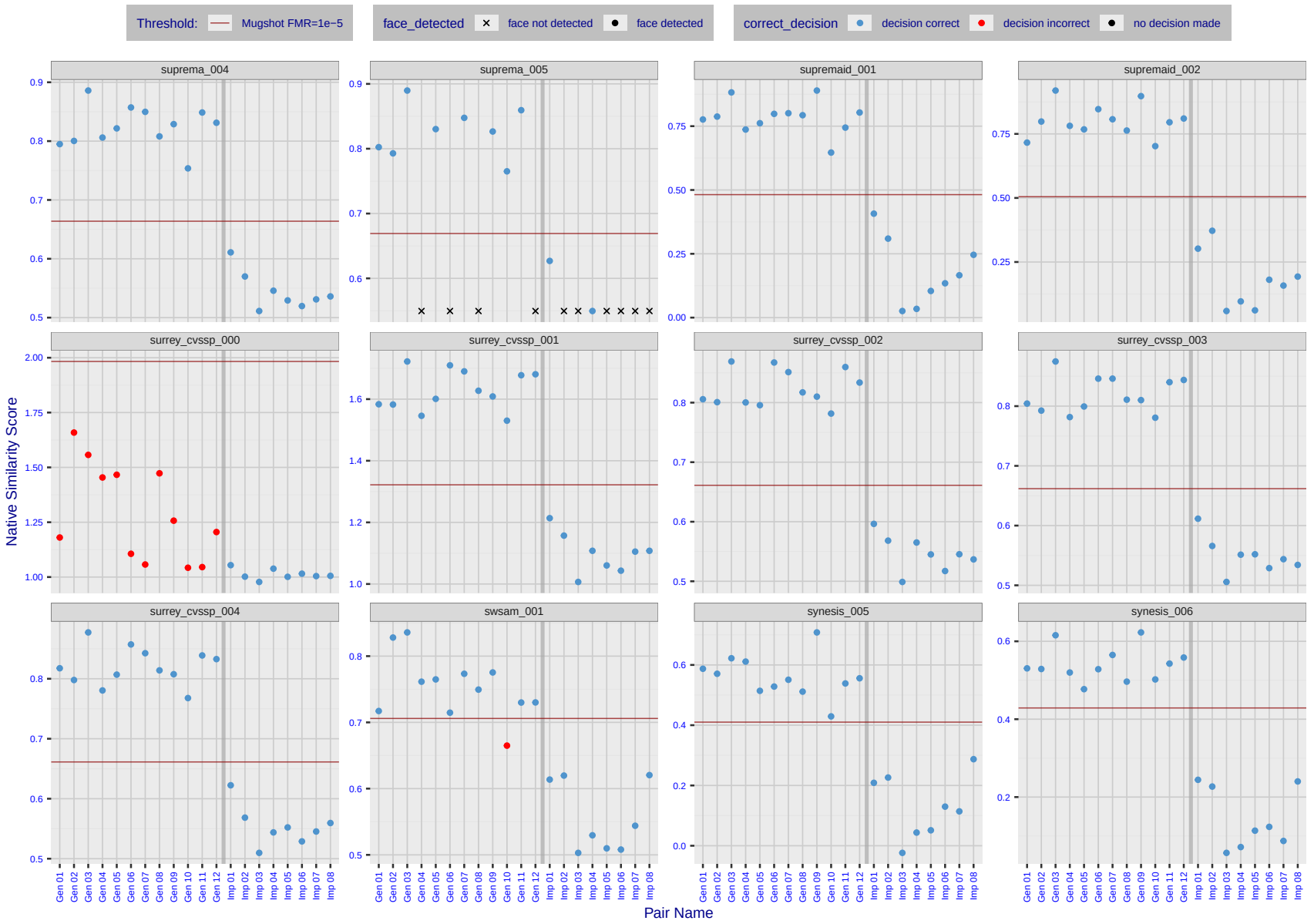

Figure 83: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

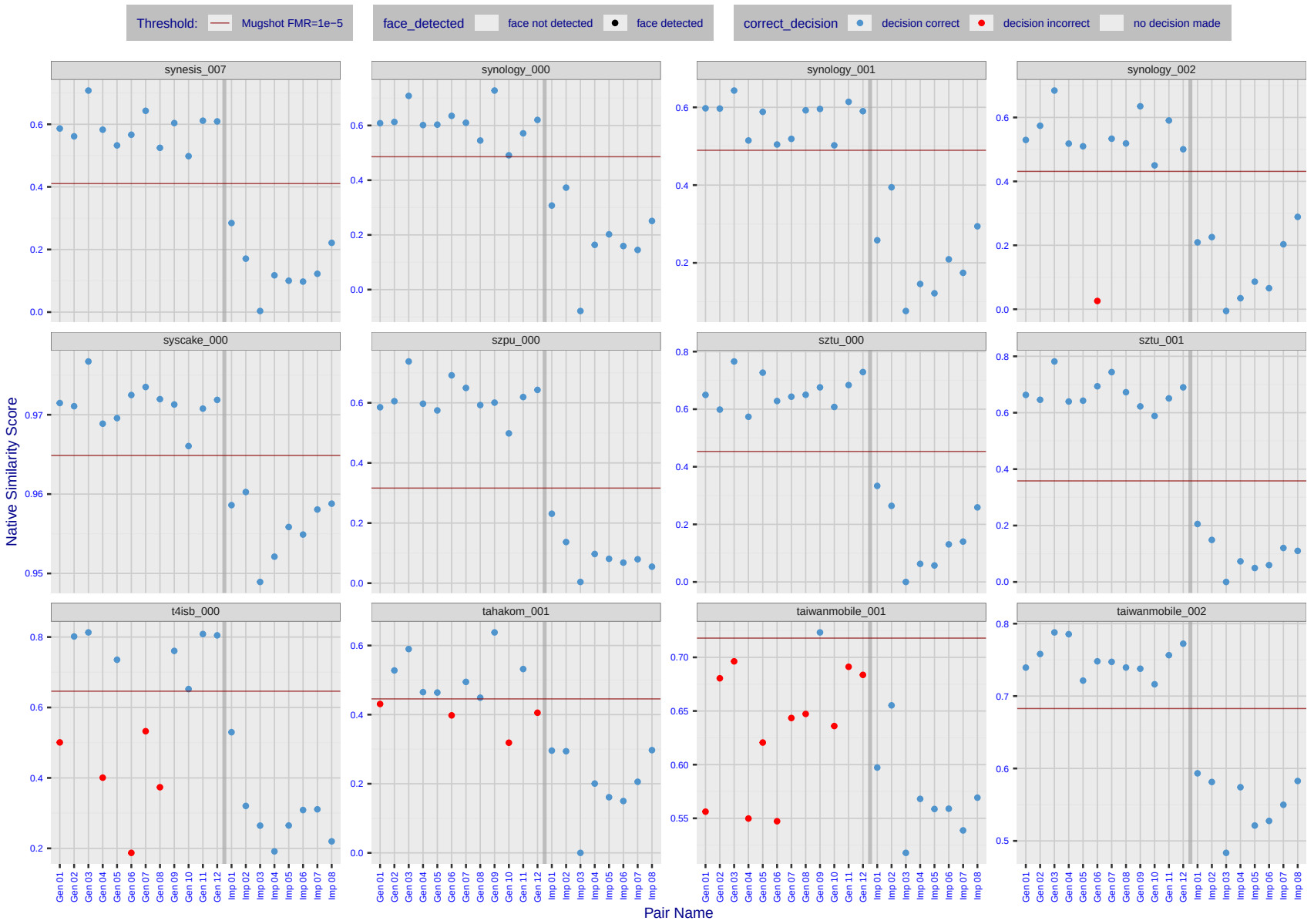

Figure 84: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

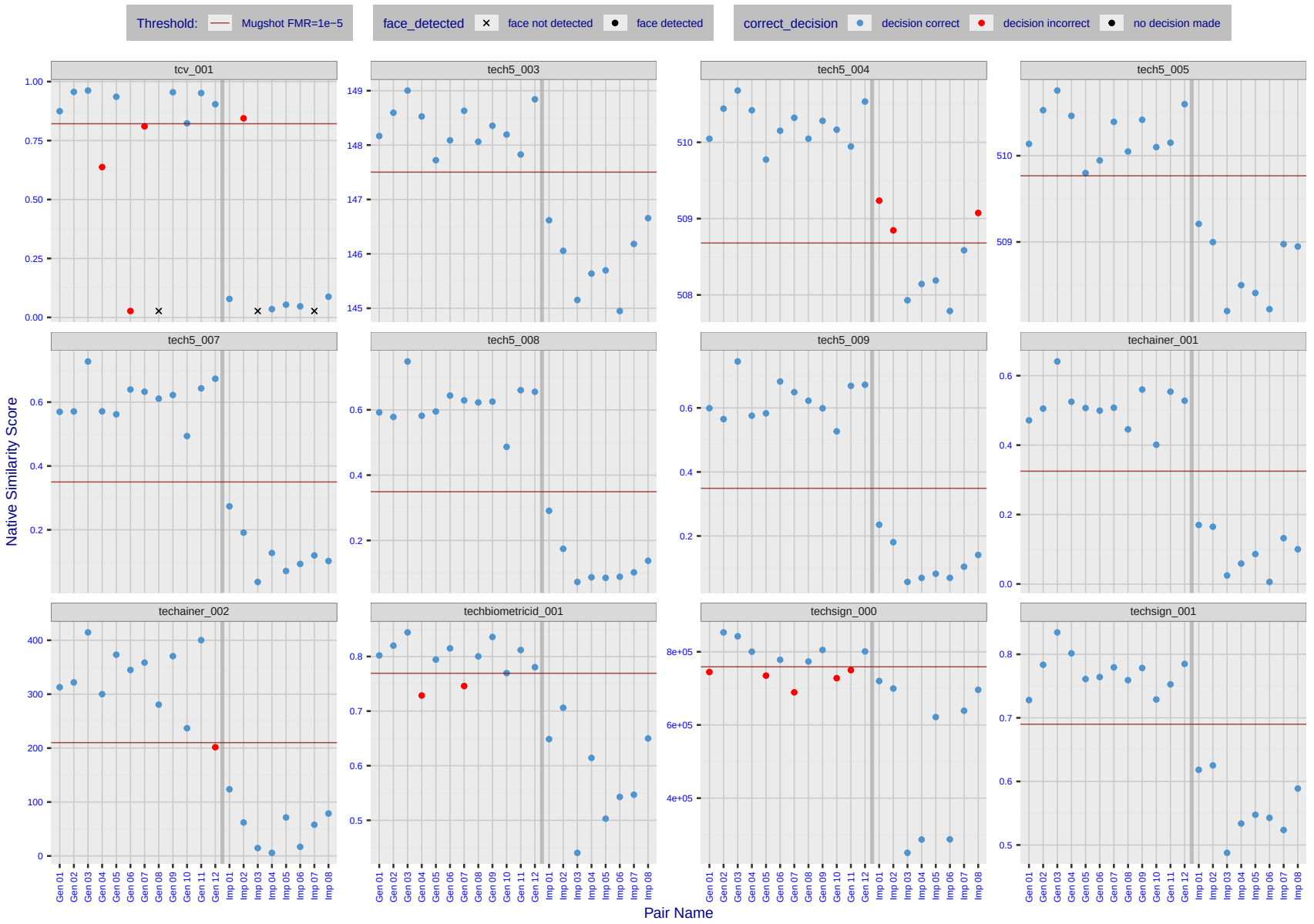

Figure 85: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

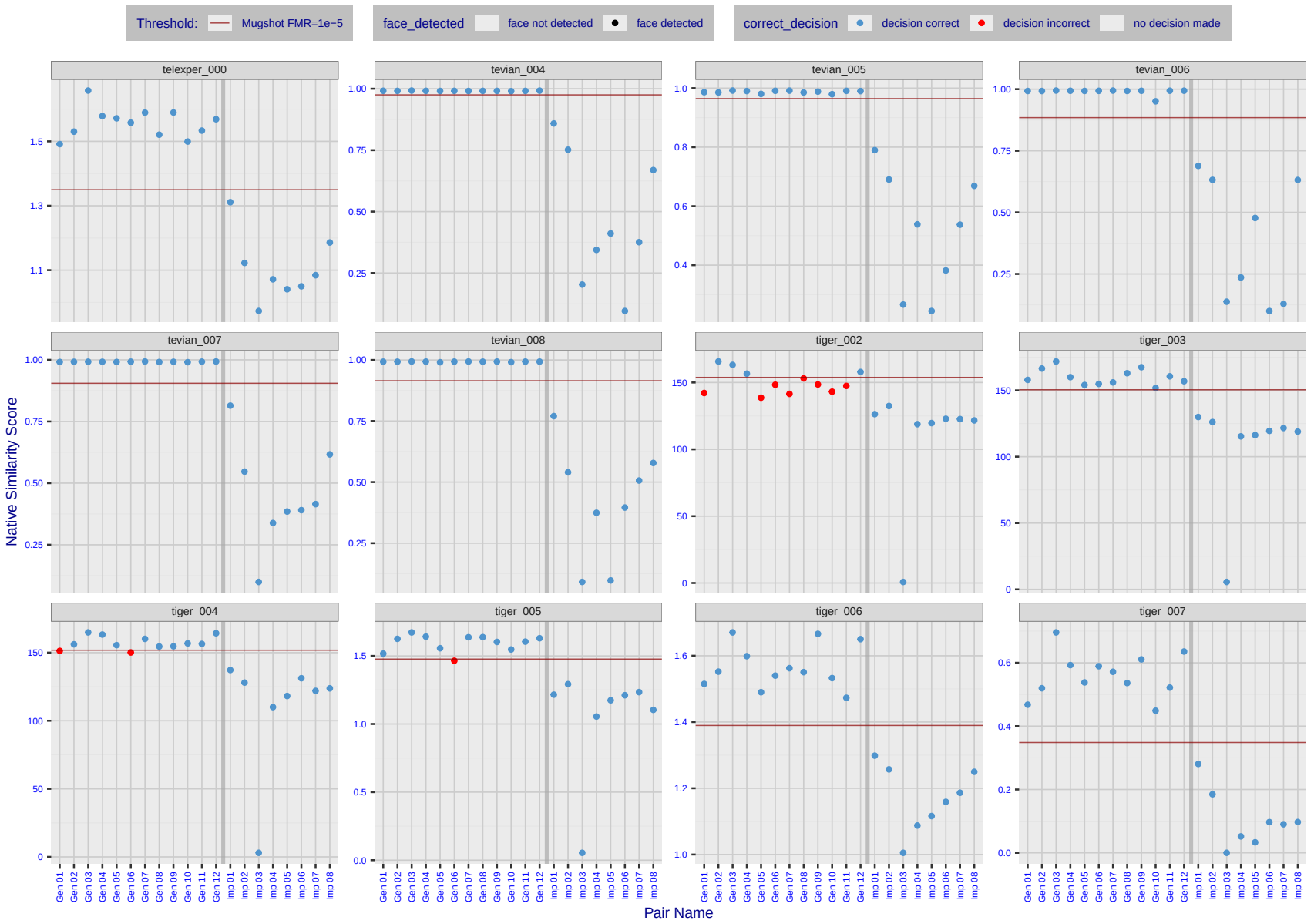

Figure 86: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

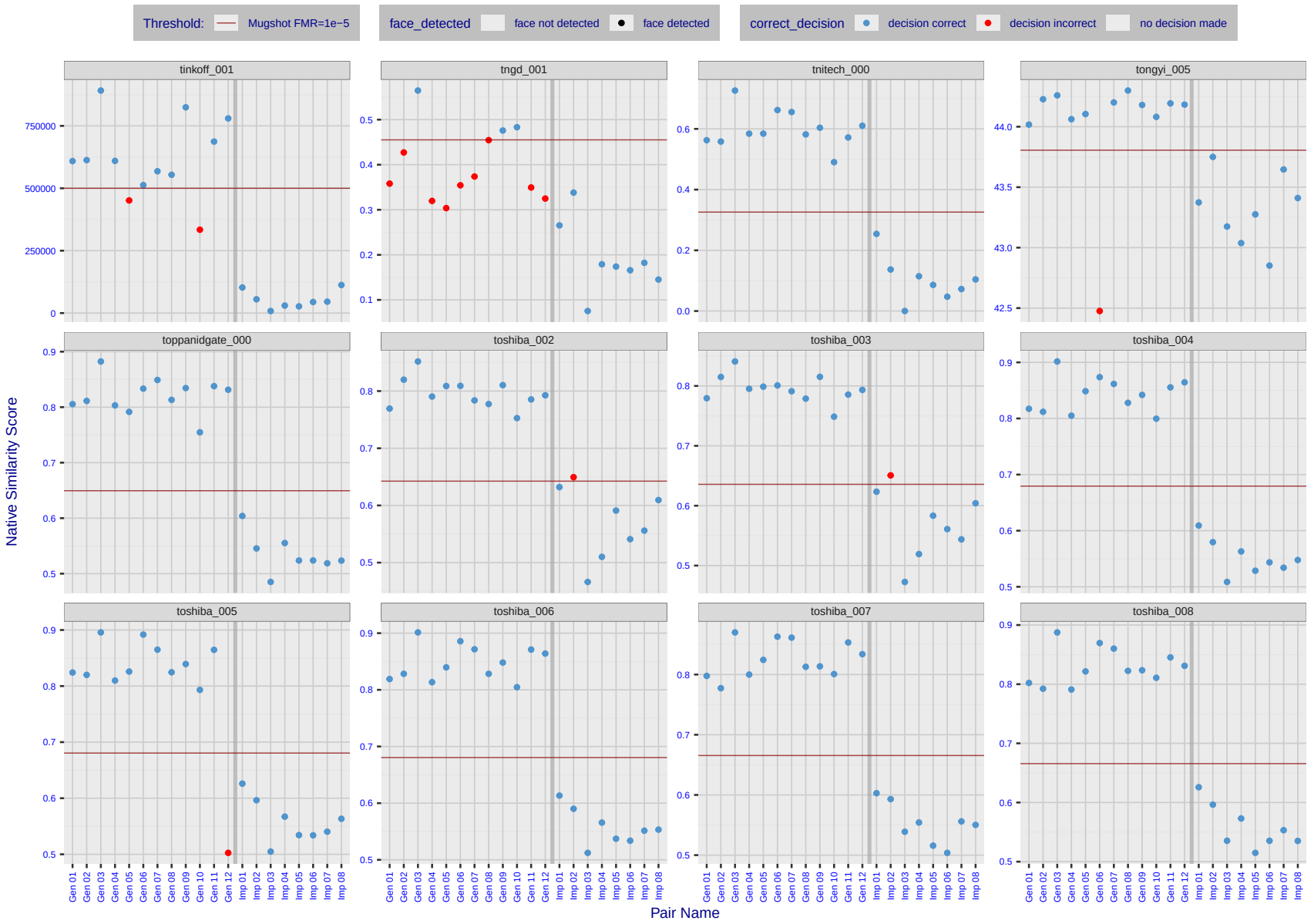

Figure 87: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

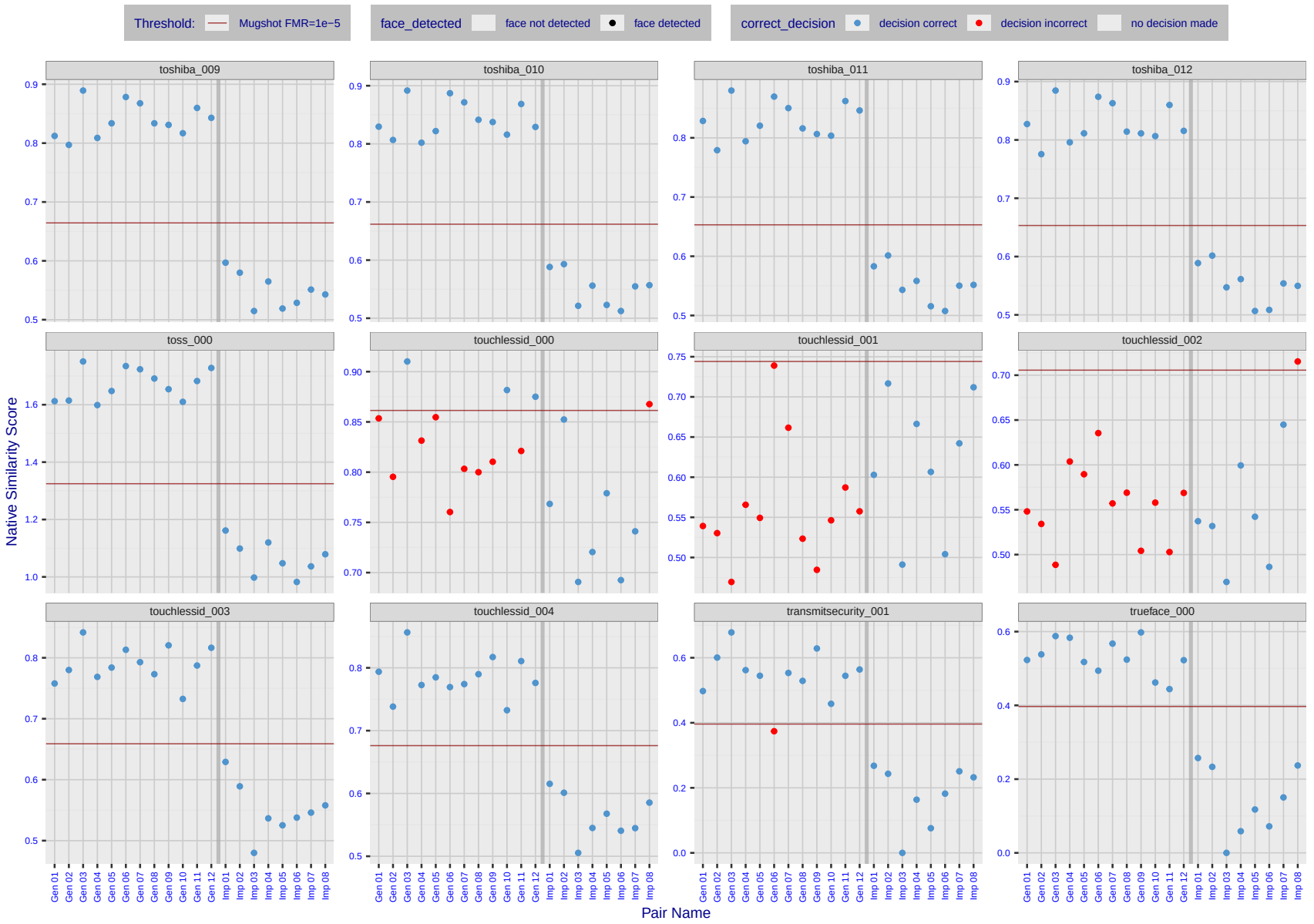

Figure 88: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

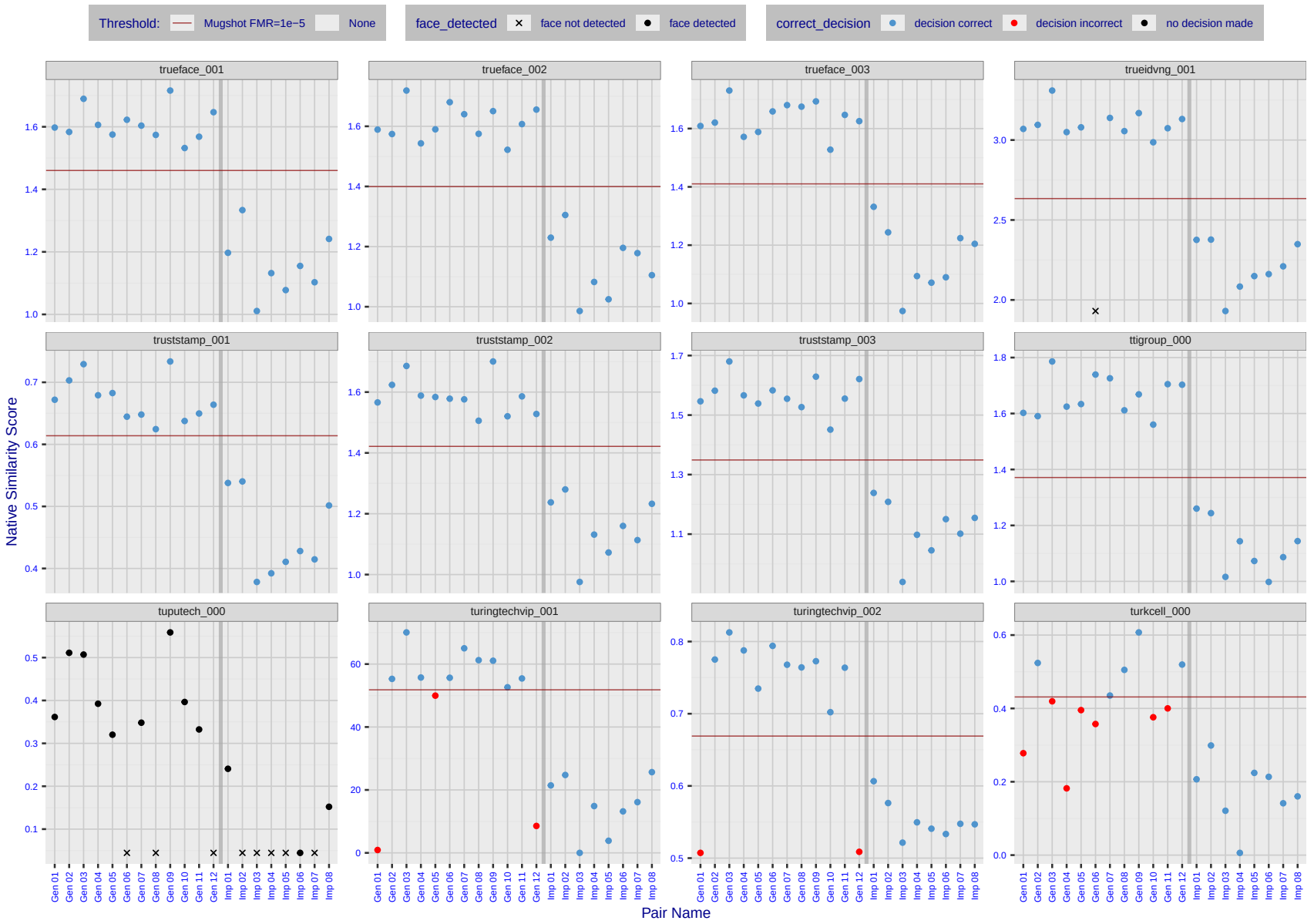

Figure 89: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

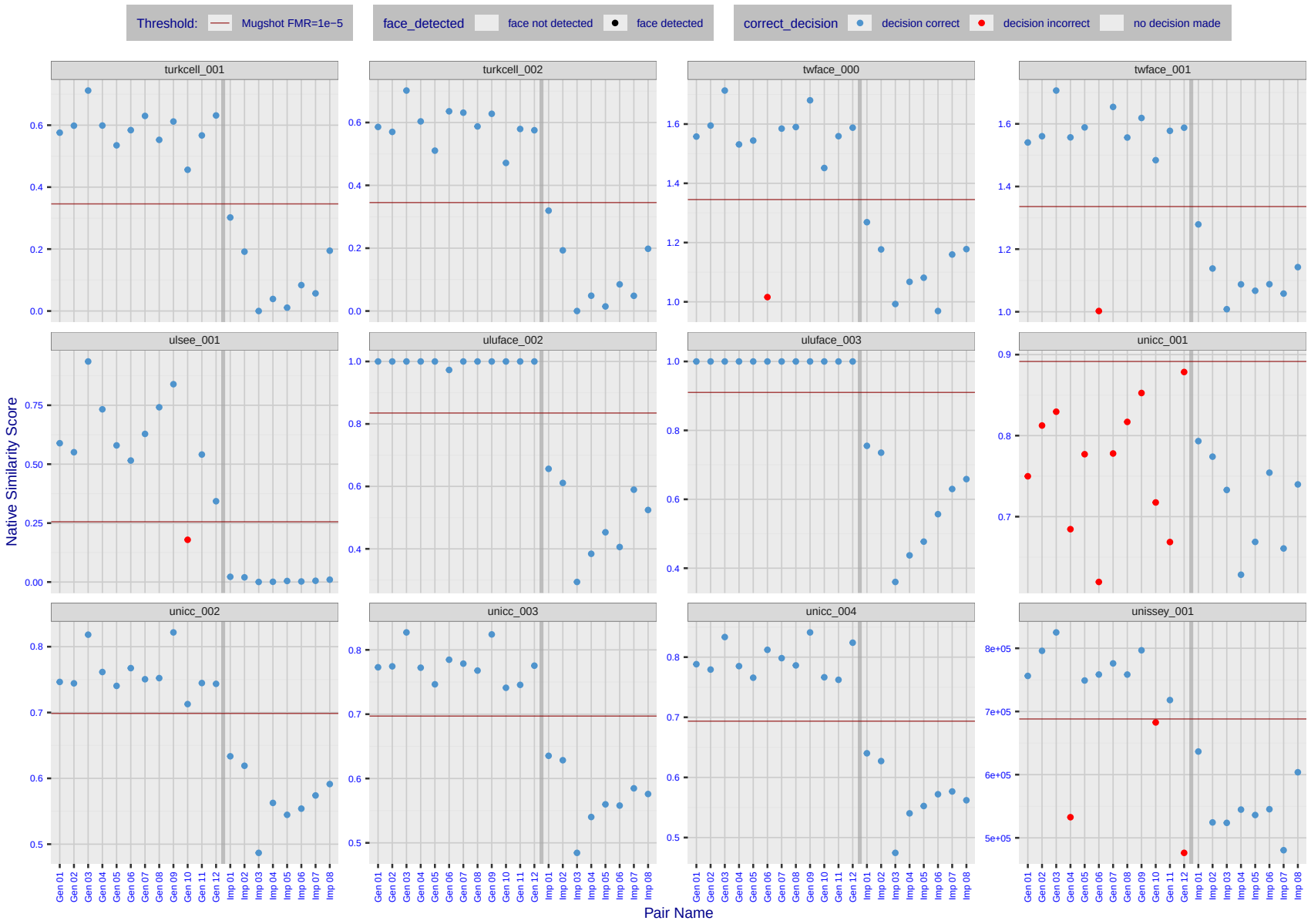

Figure 90: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

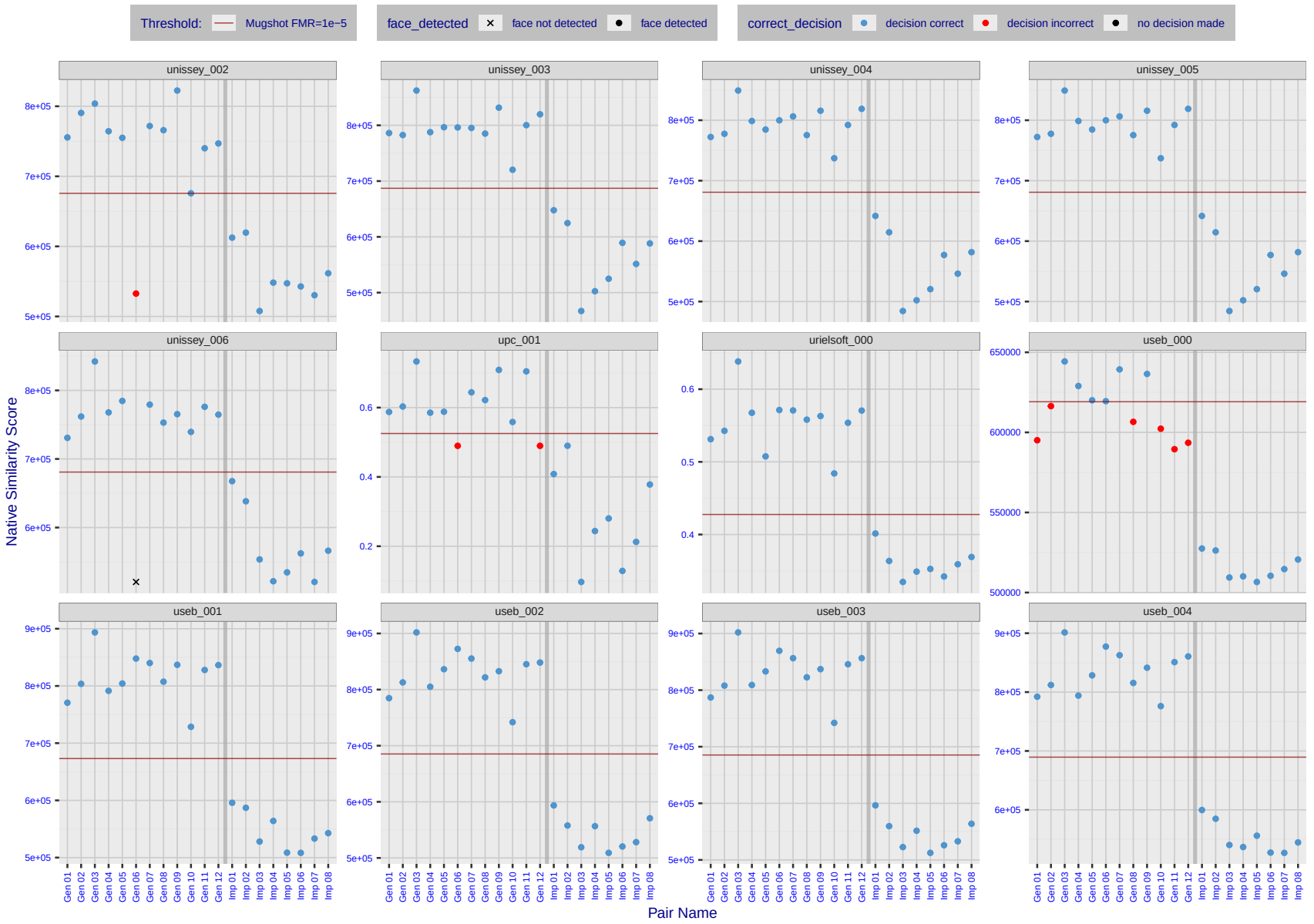

Figure 91: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

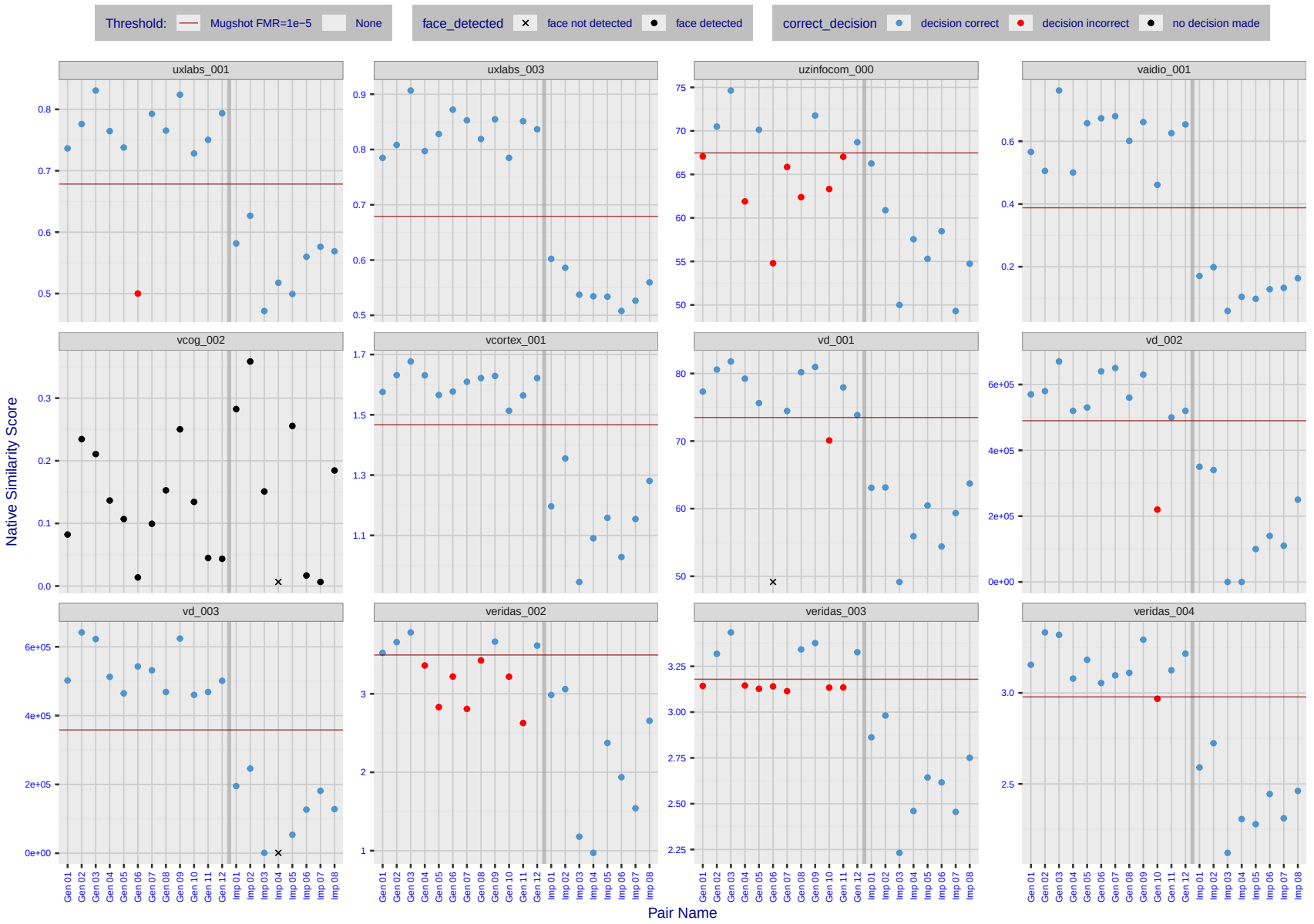

Figure 92: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

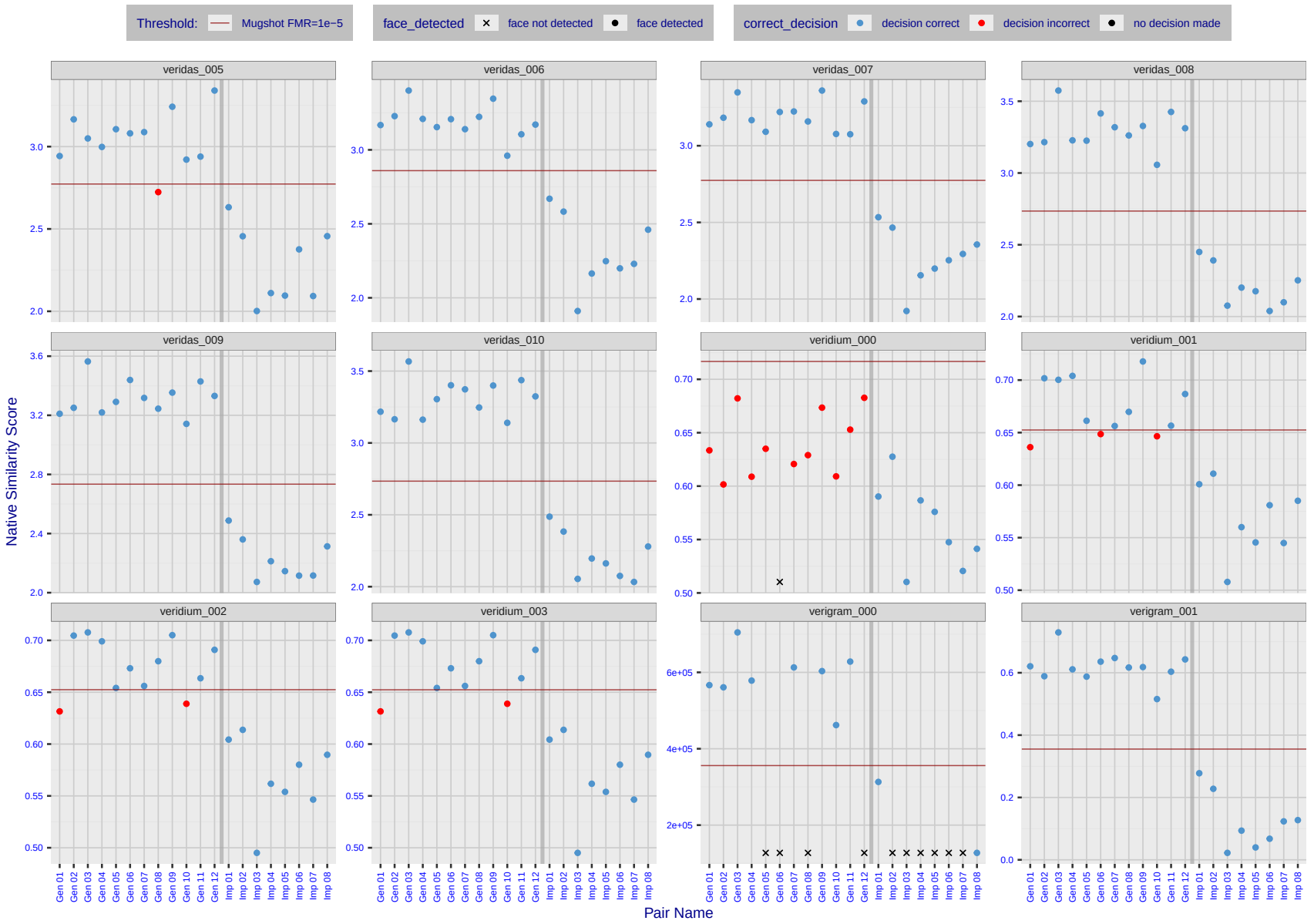

Figure 93: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

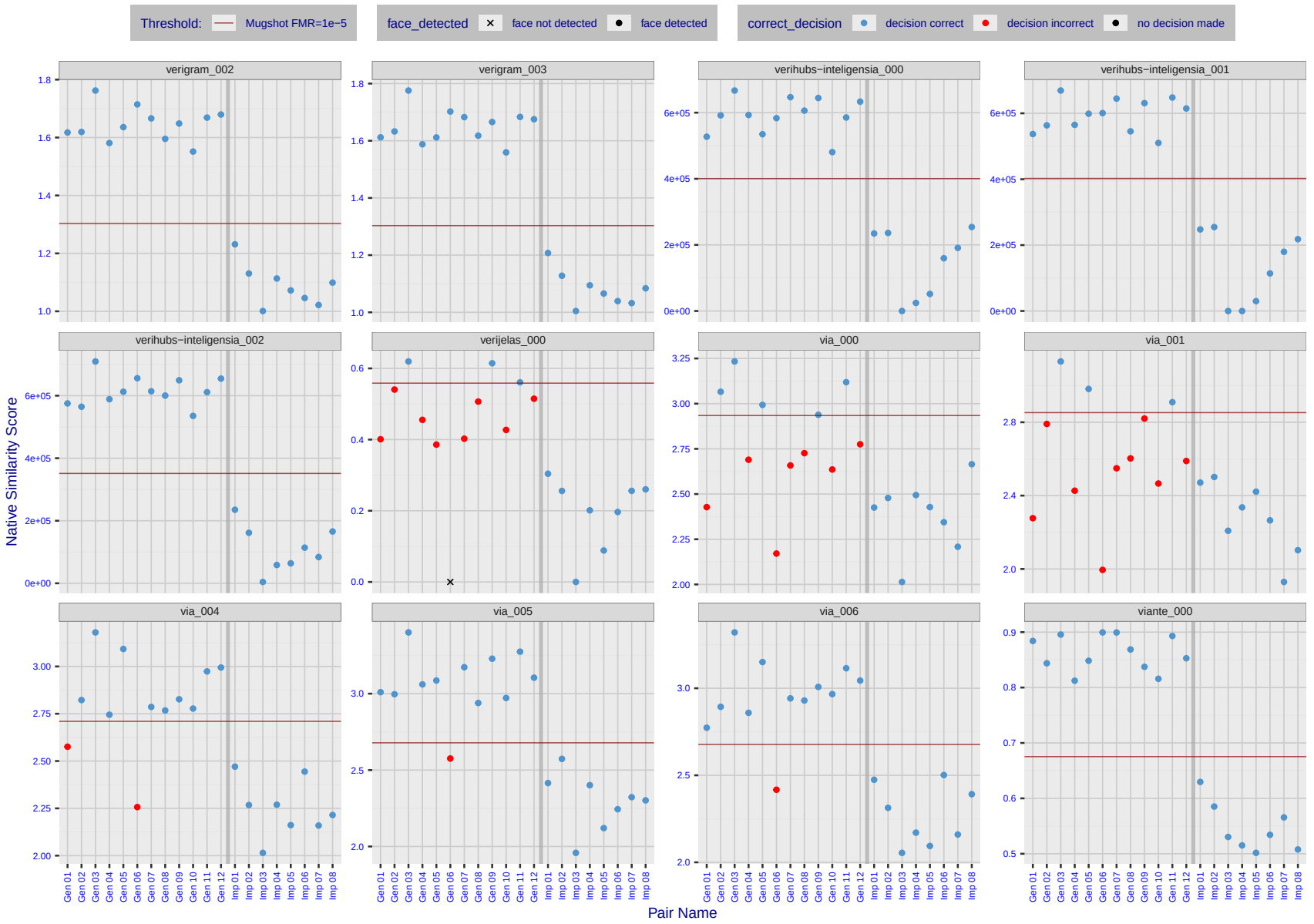

Figure 94: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

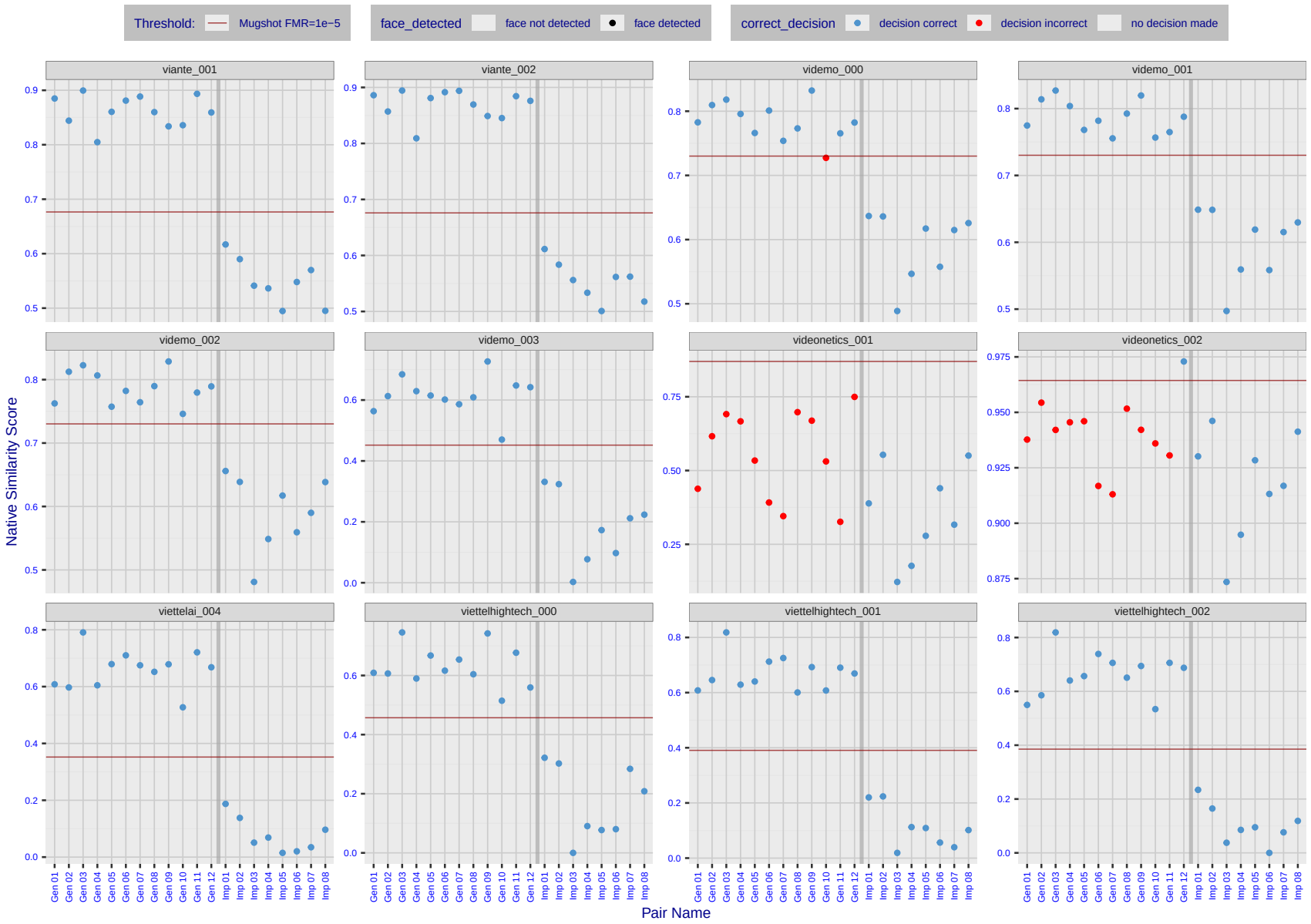

Figure 95: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

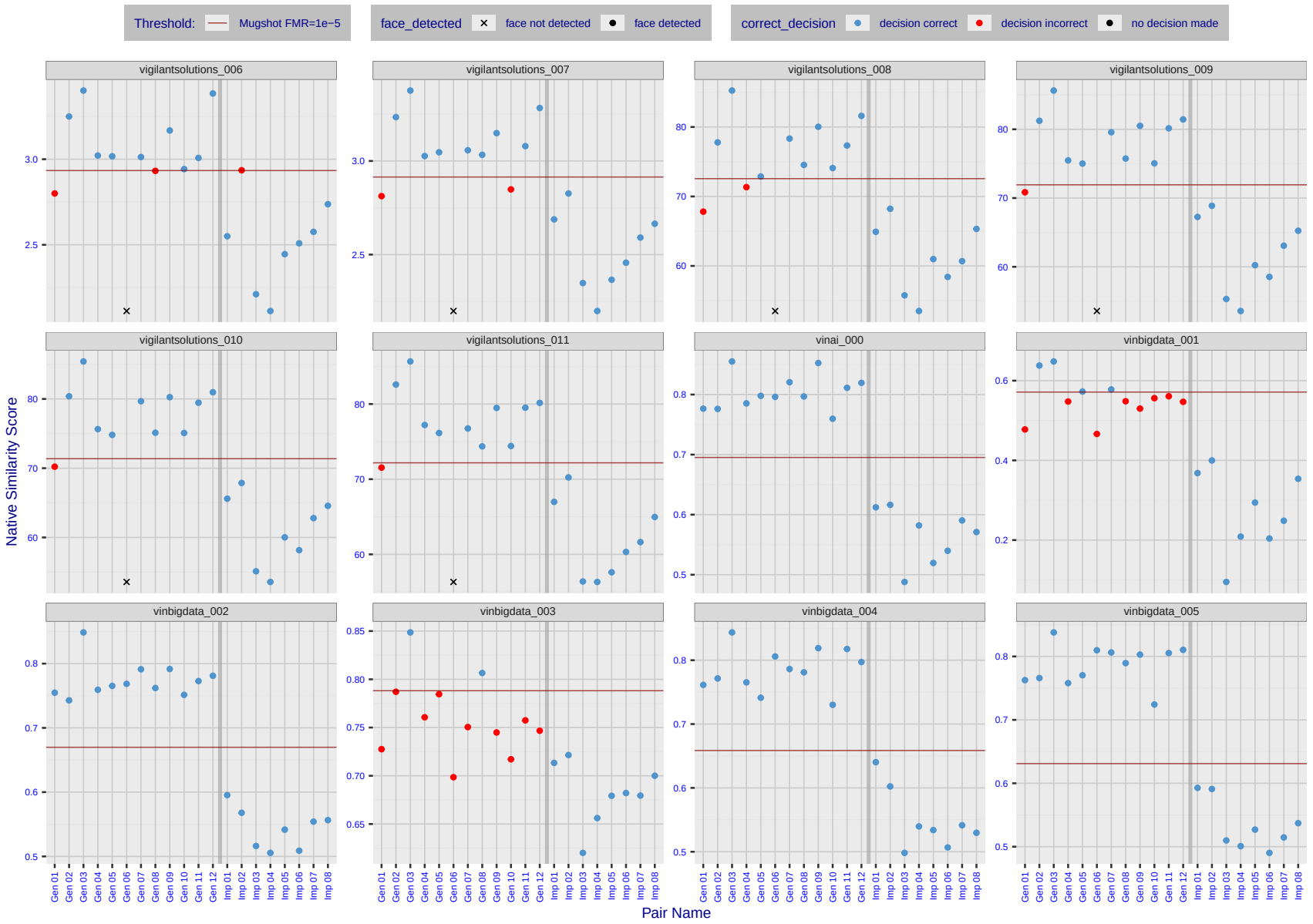

Figure 96: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

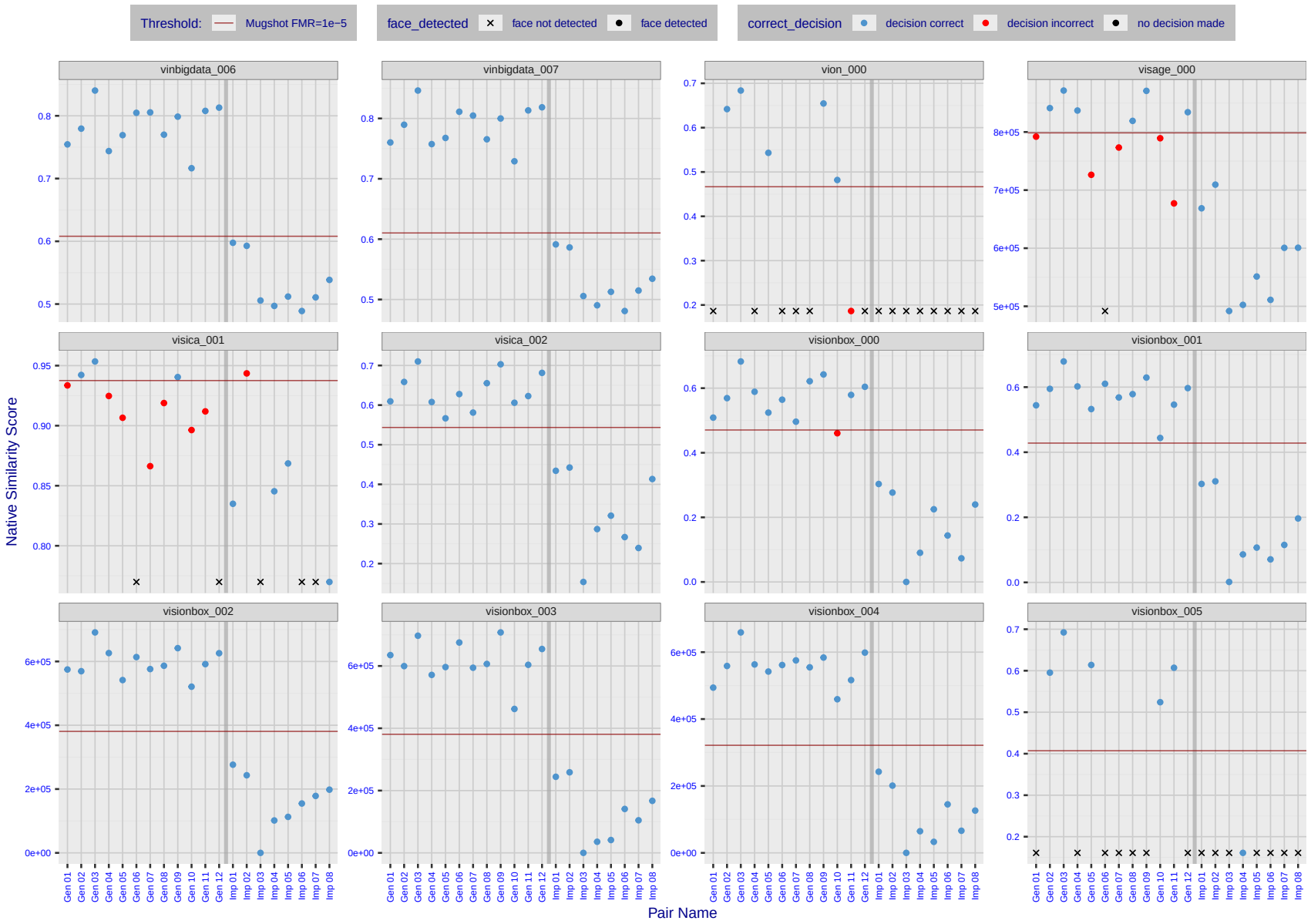

Figure 97: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

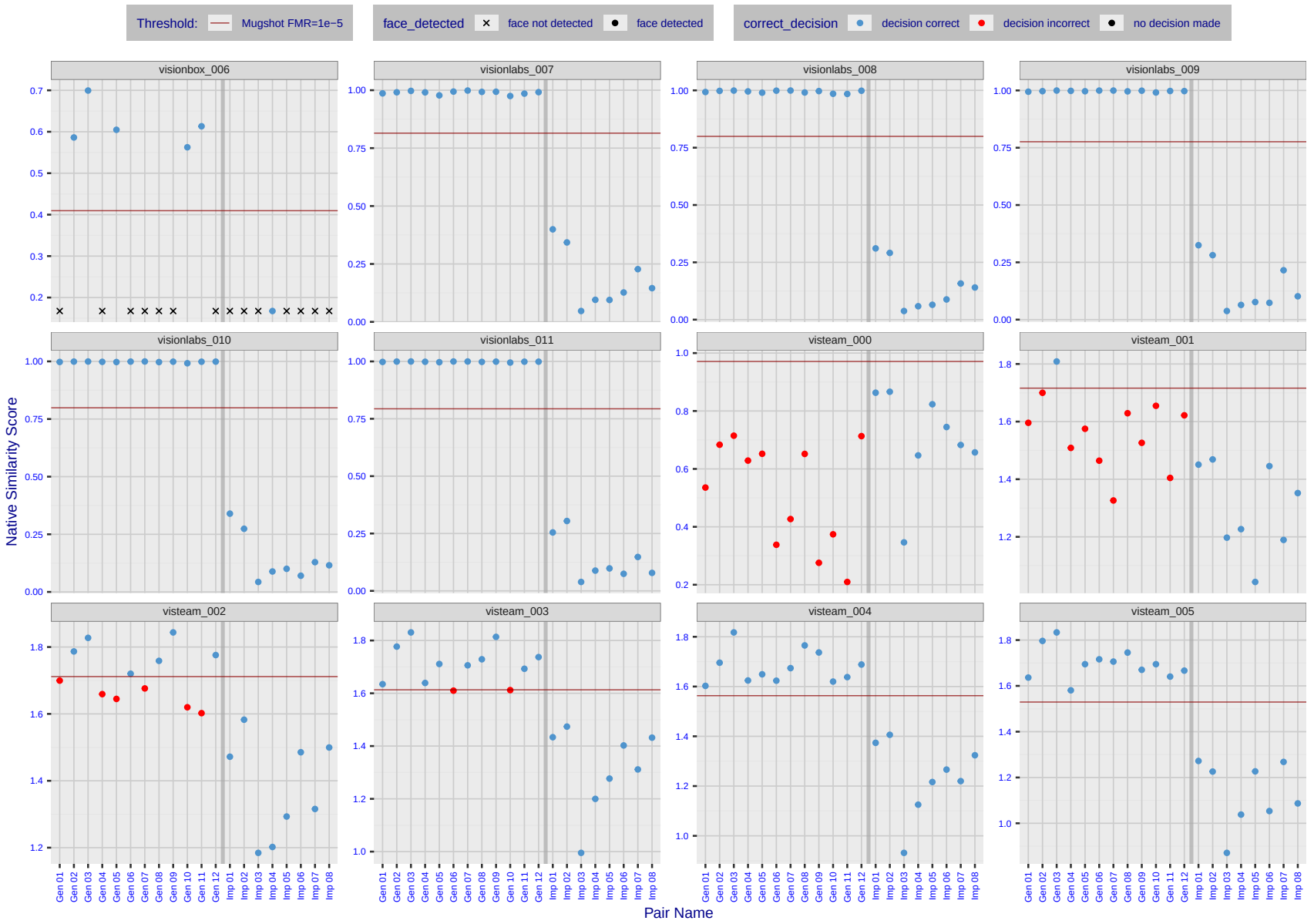

Figure 98: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

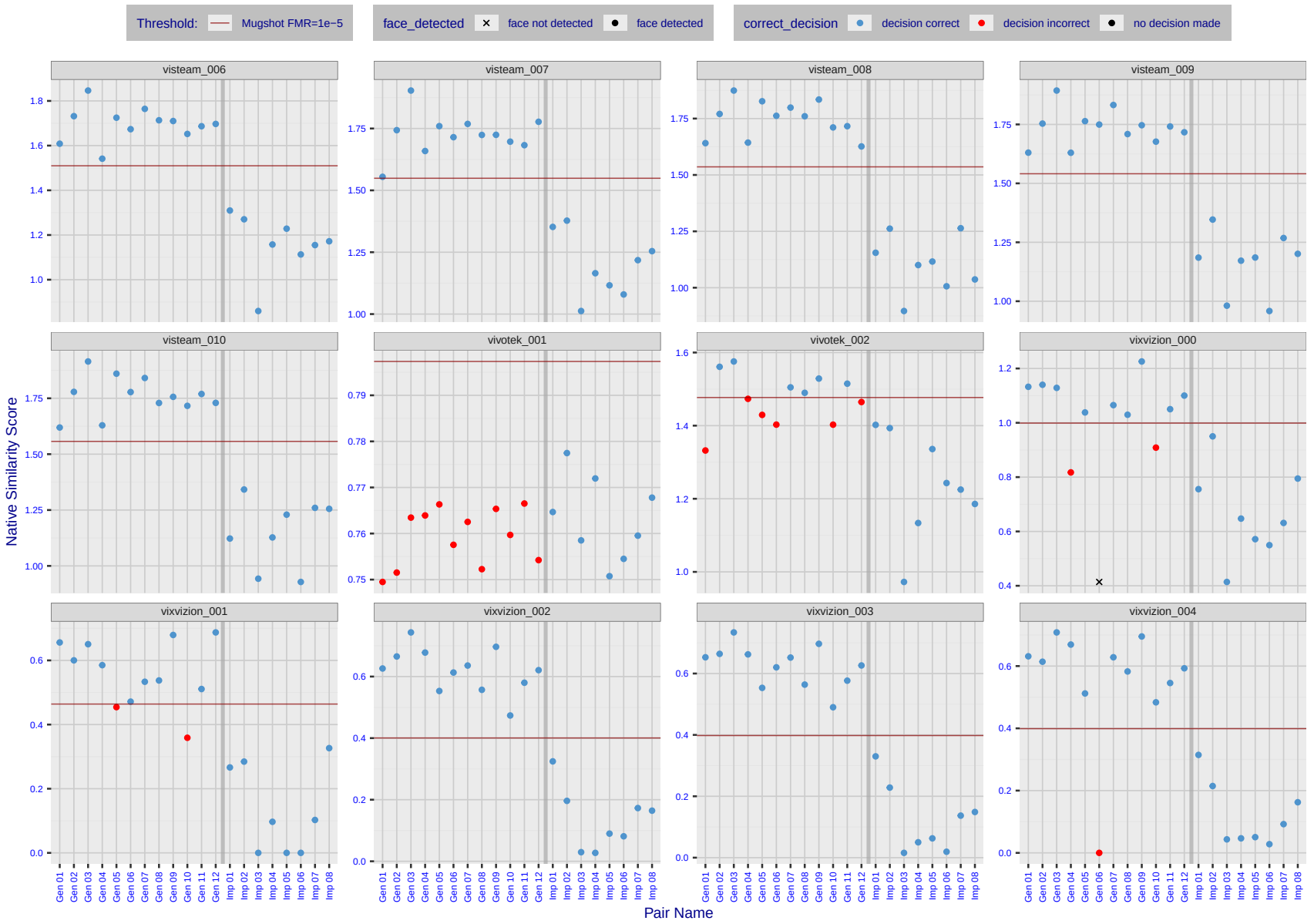

Figure 99: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

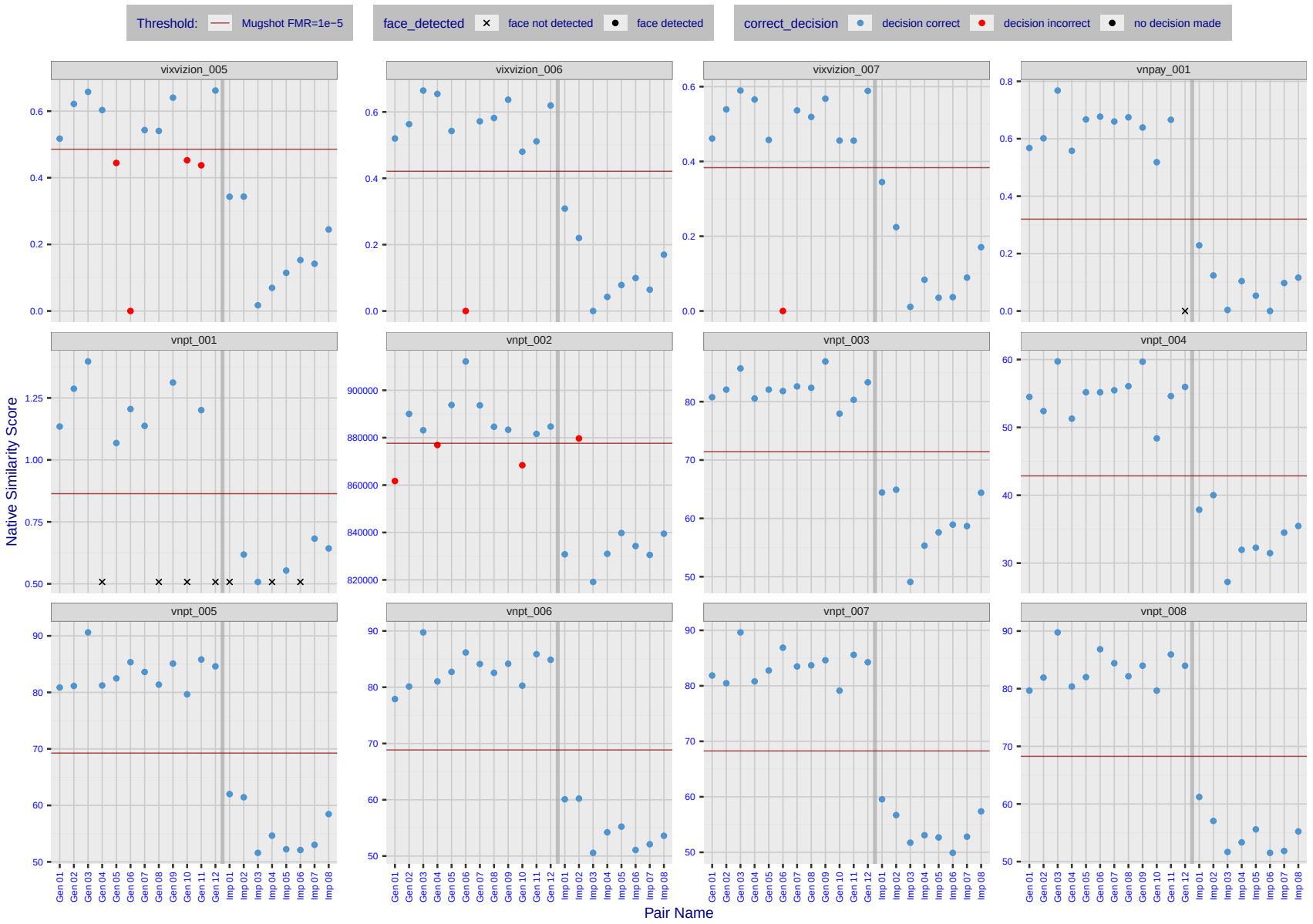

Figure 100: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

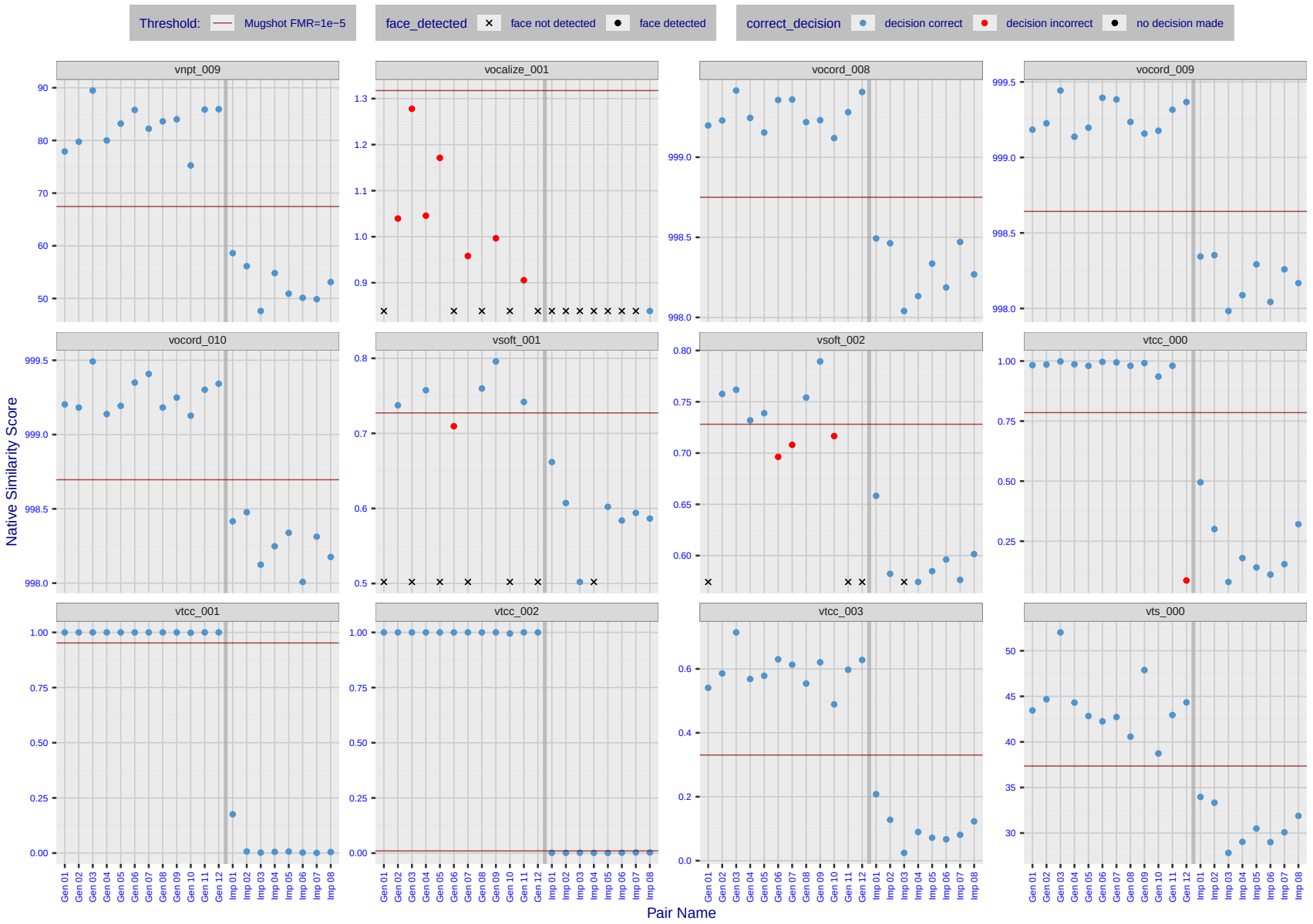

Figure 101: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

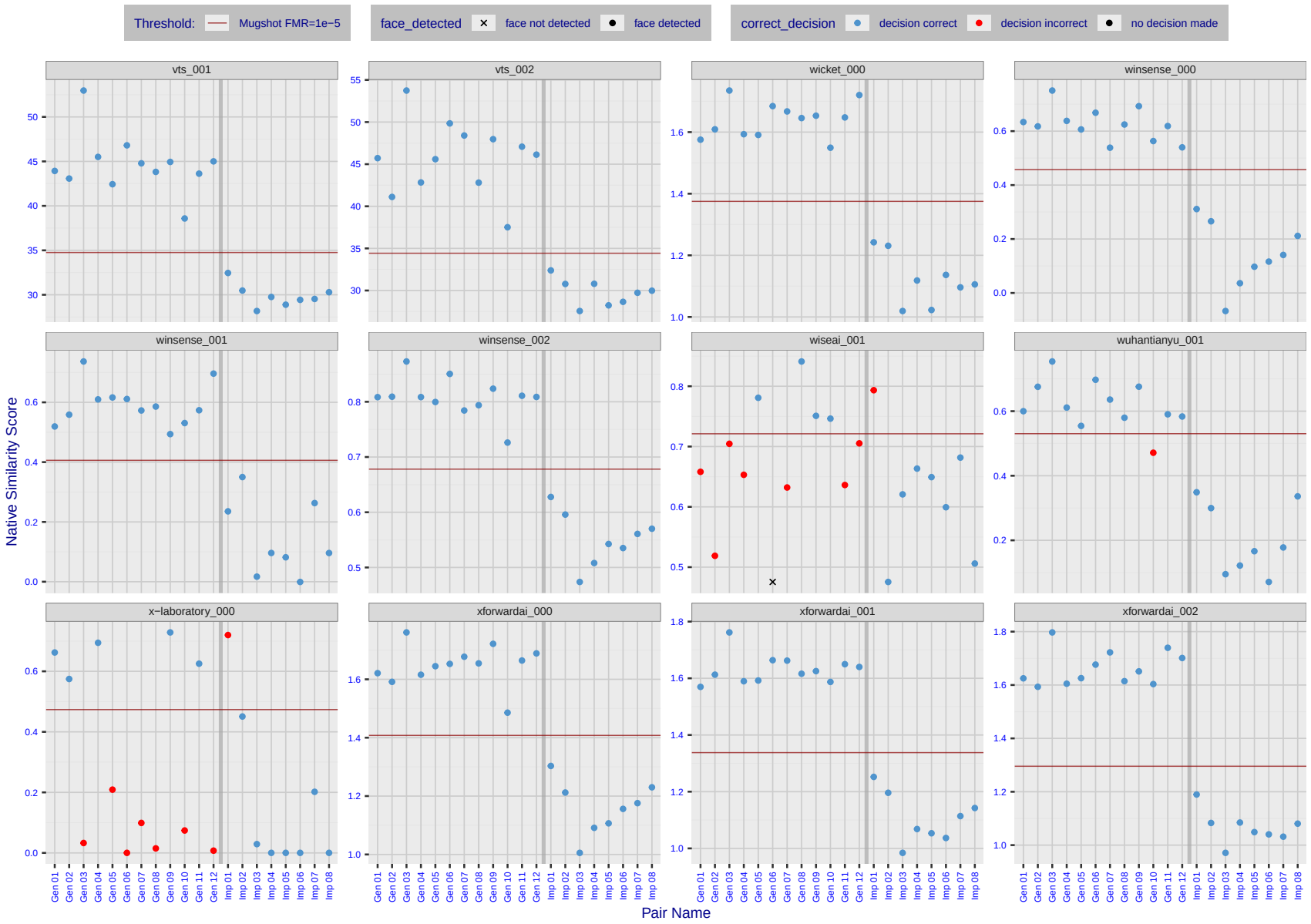

Figure 102: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

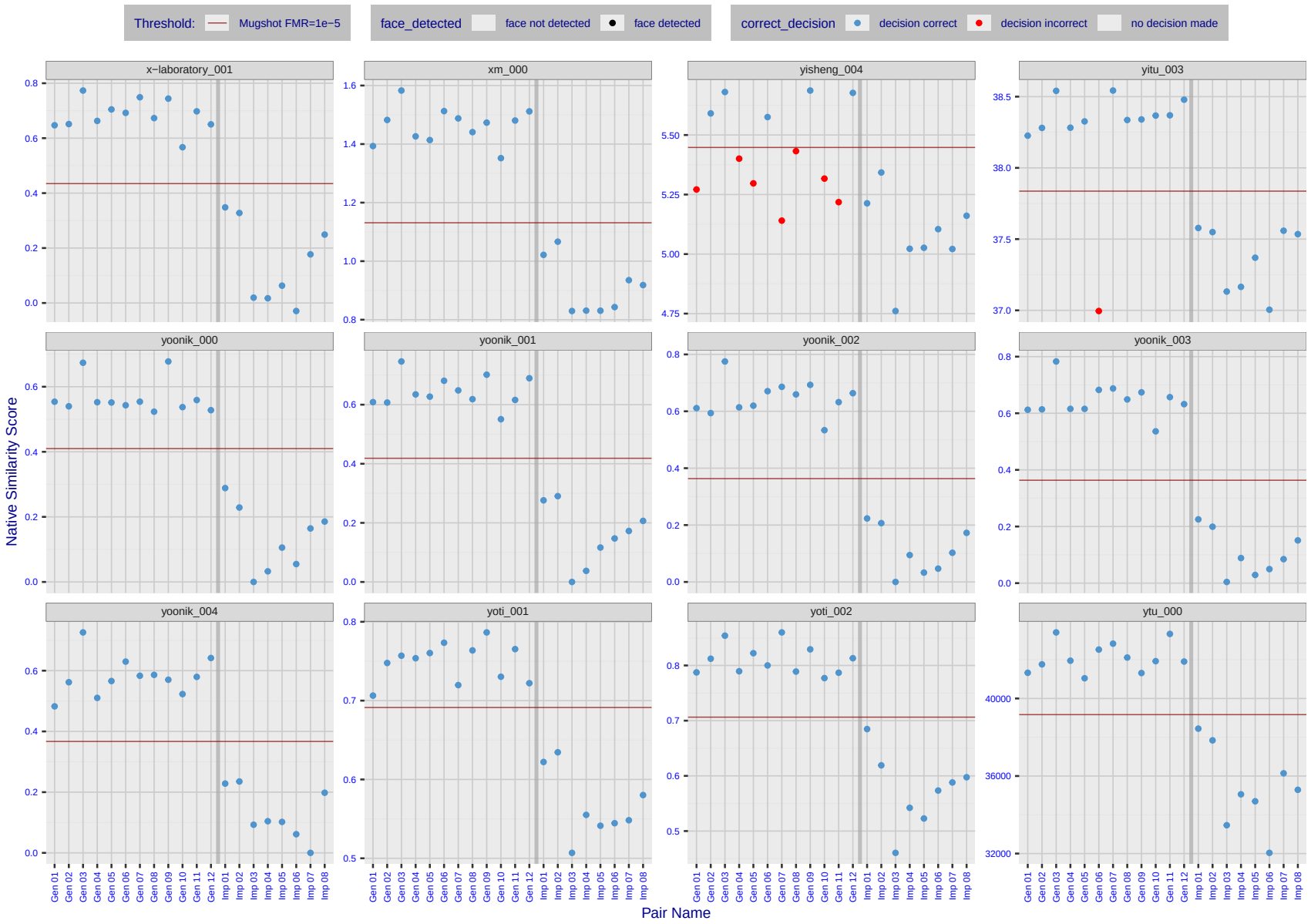

Figure 103: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

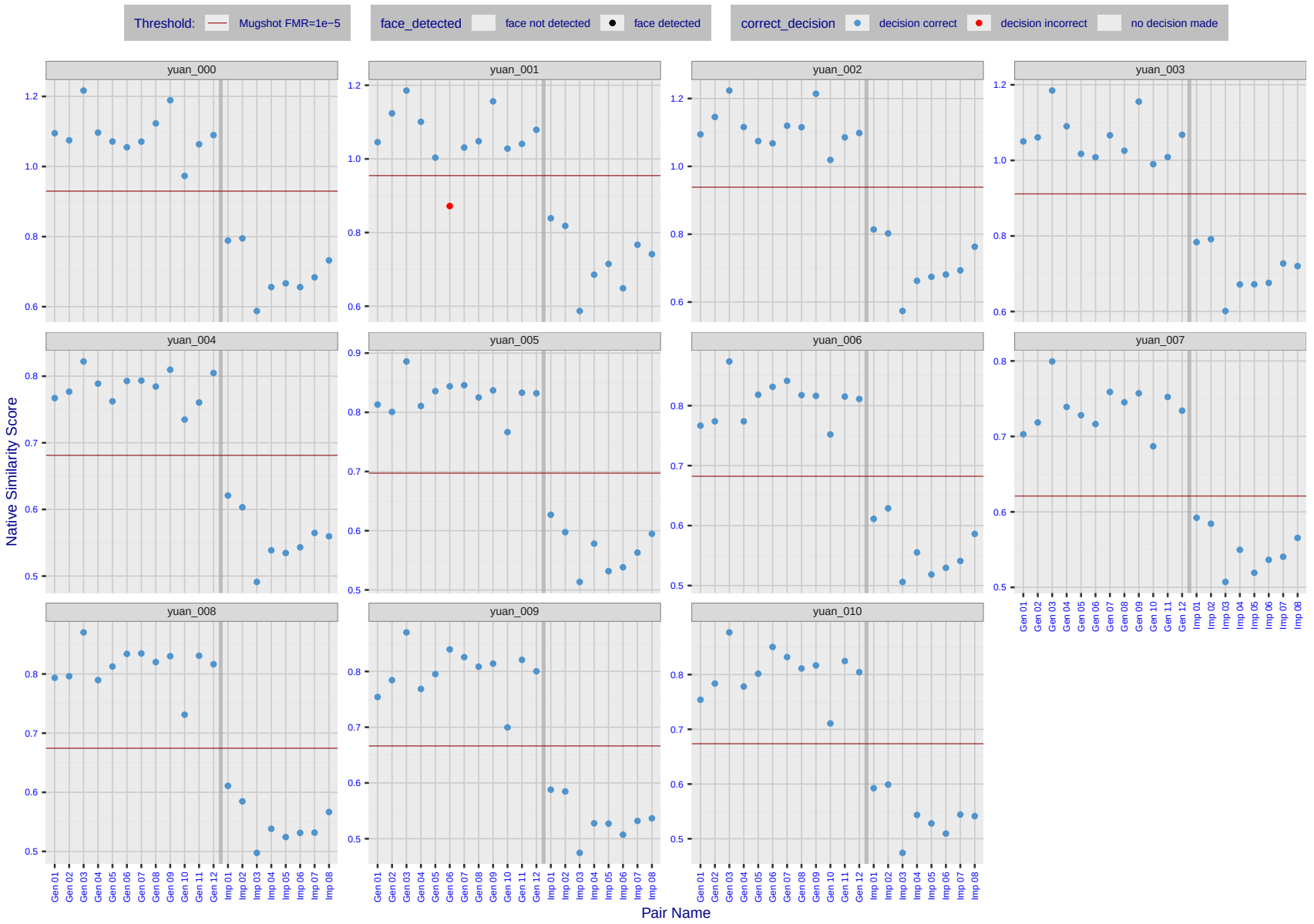

Figure 104: The figure shows algorithms' similarity scores for 12 genuine and 8 impostor image pairs used in a May 2018 paper by Phillips et al. ([1]). The threshold (red horizontal line) is a value calibrated to give FMR = 0.0001 on mugshot images. Points above the threshold correspond to pairs determined to be genuine, and points below the threshold correspond to pairs determined to be impostors. If the determined class (genuine or impostor) matches the real class, points will be blue; if not, red. An X represents face detection failure in either of the images in the pair. Note that the sample size (n=20) is small, and the figure may change substantially if larger or different sets are used. The images can be viewed on p. 13 of the Appendix, where Gen 01 corresponds to Same-Identity Pair 1, Gen 02 corresponds to Same-Identity Pair 2, and so on.

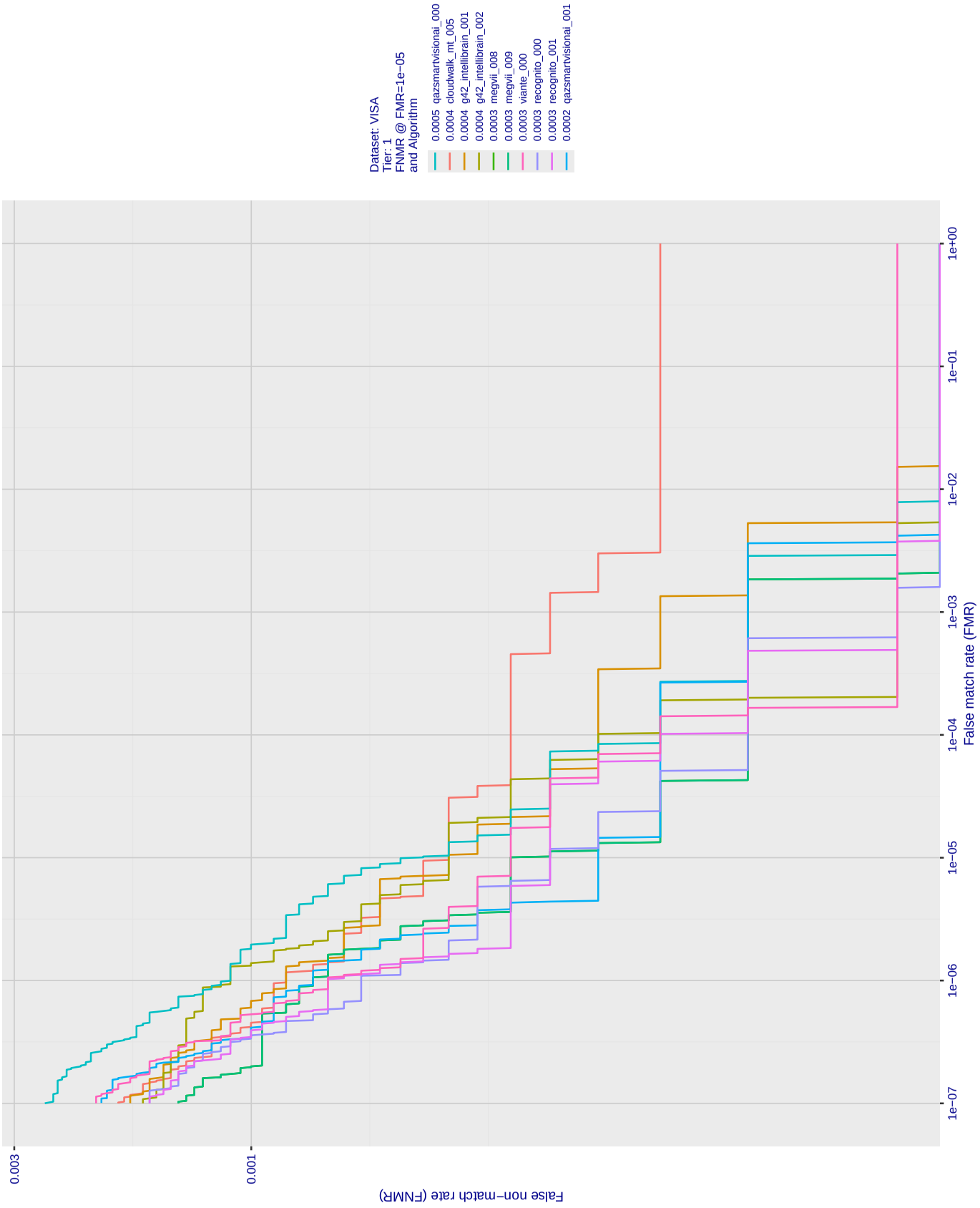

Figure 105: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

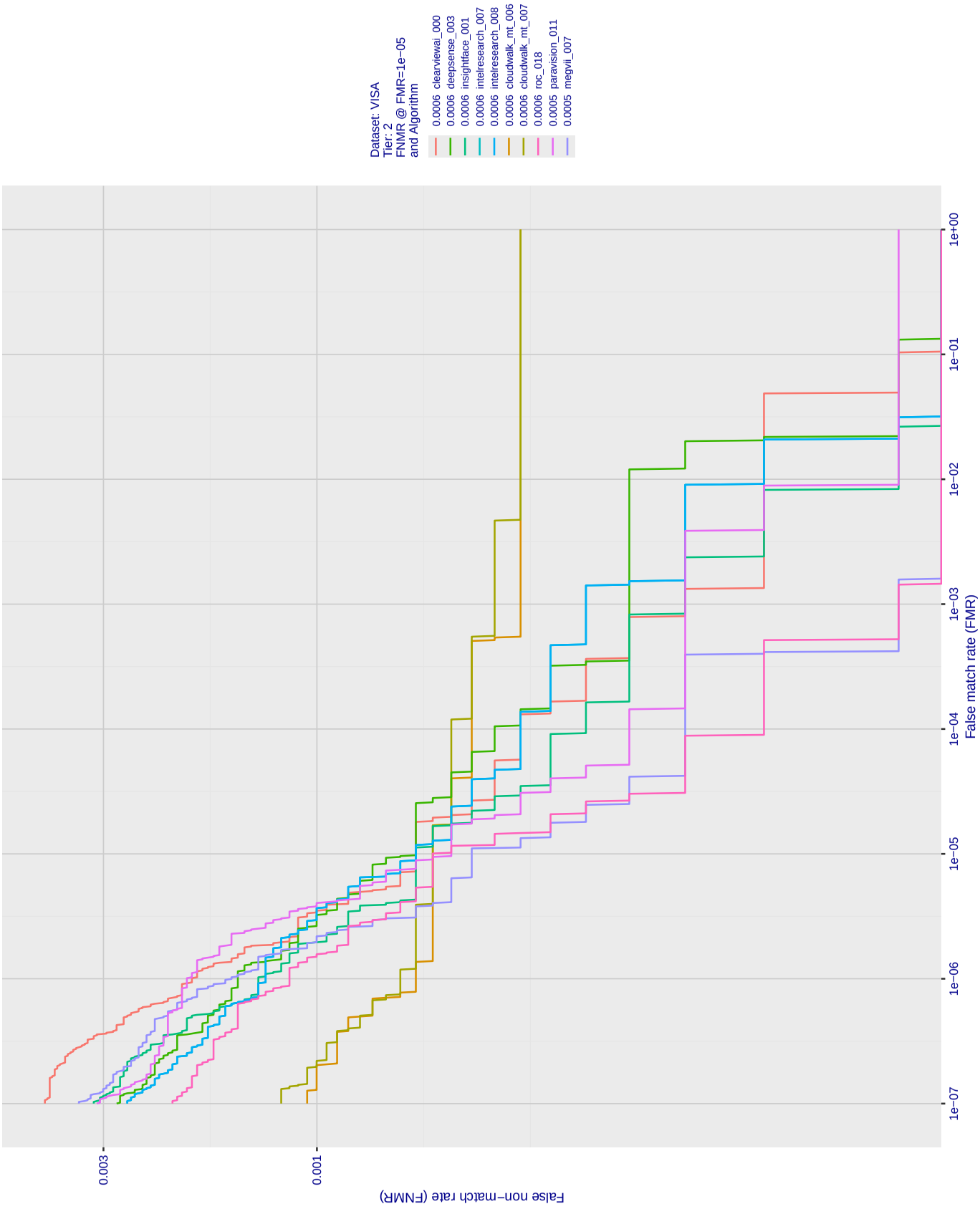

Figure 106: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

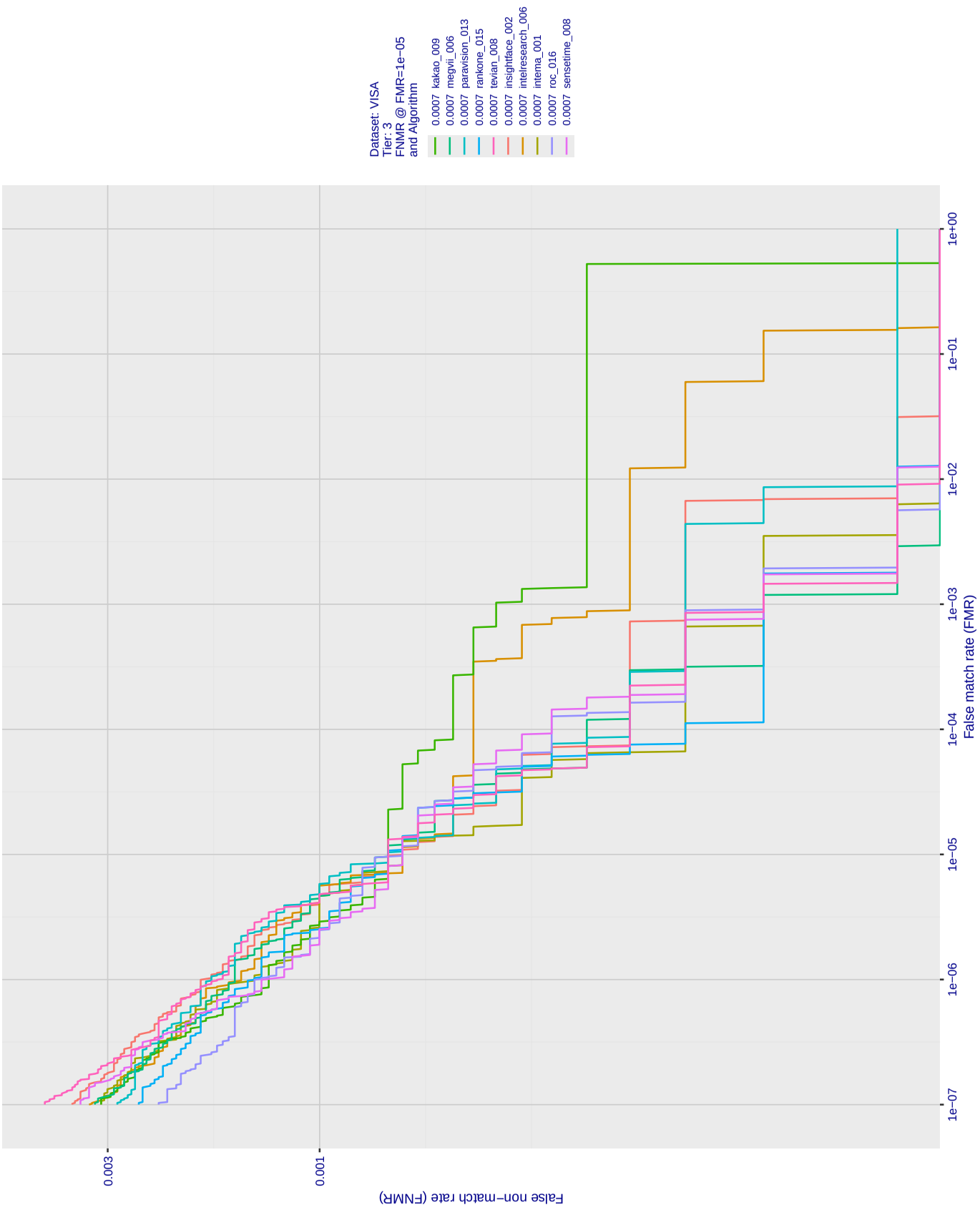

Figure 107: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

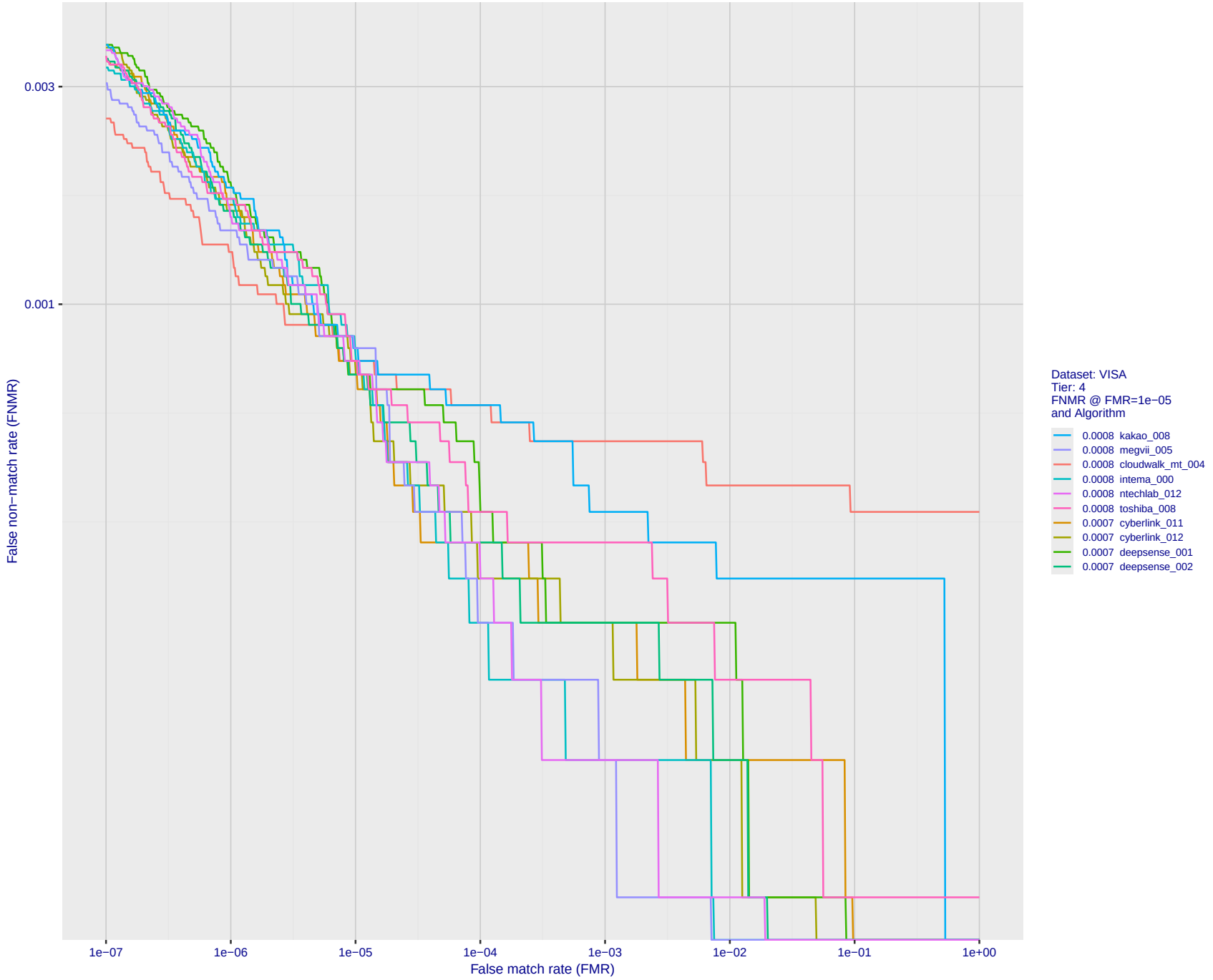

Figure 108: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

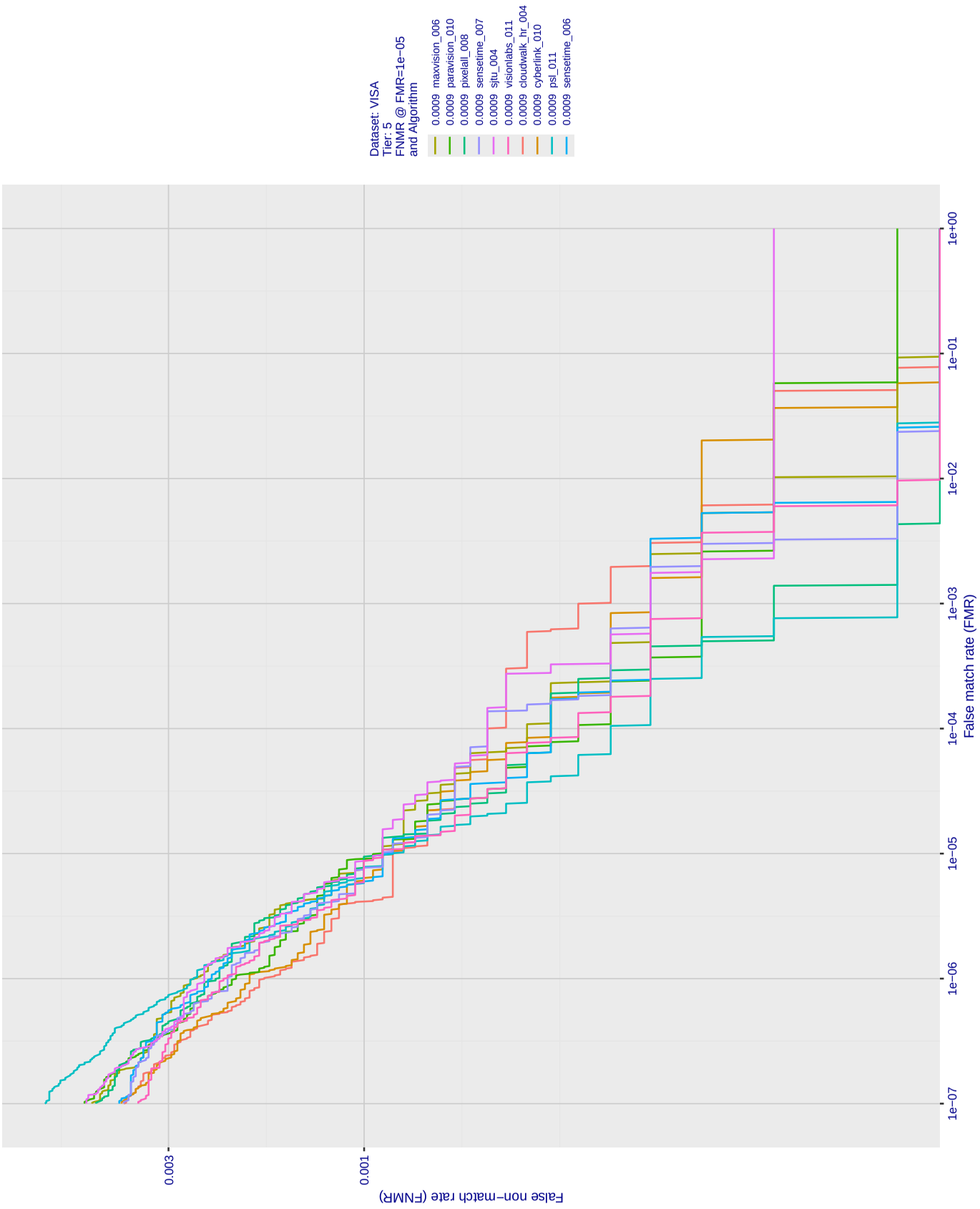

Figure 109: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

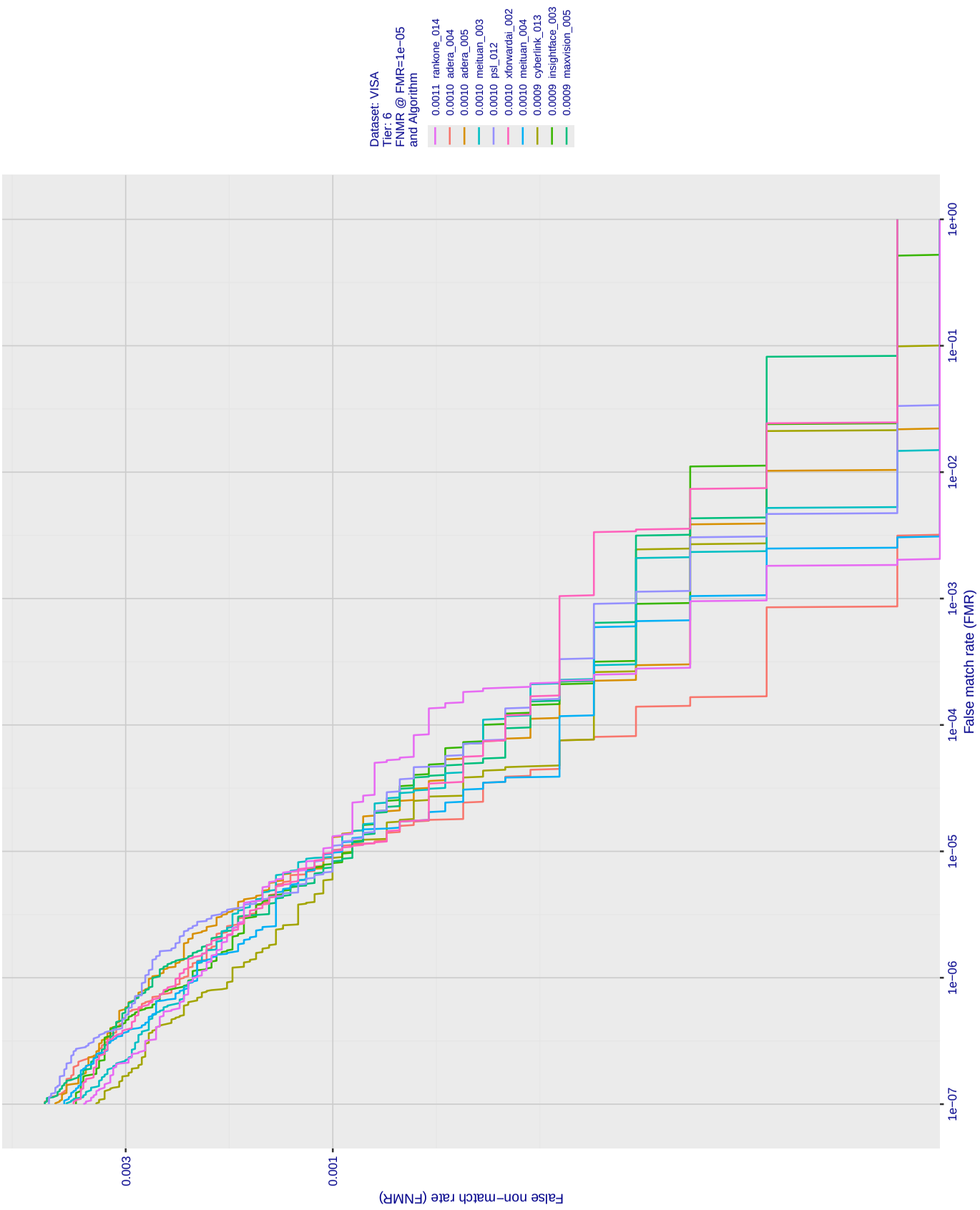

Figure 110: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

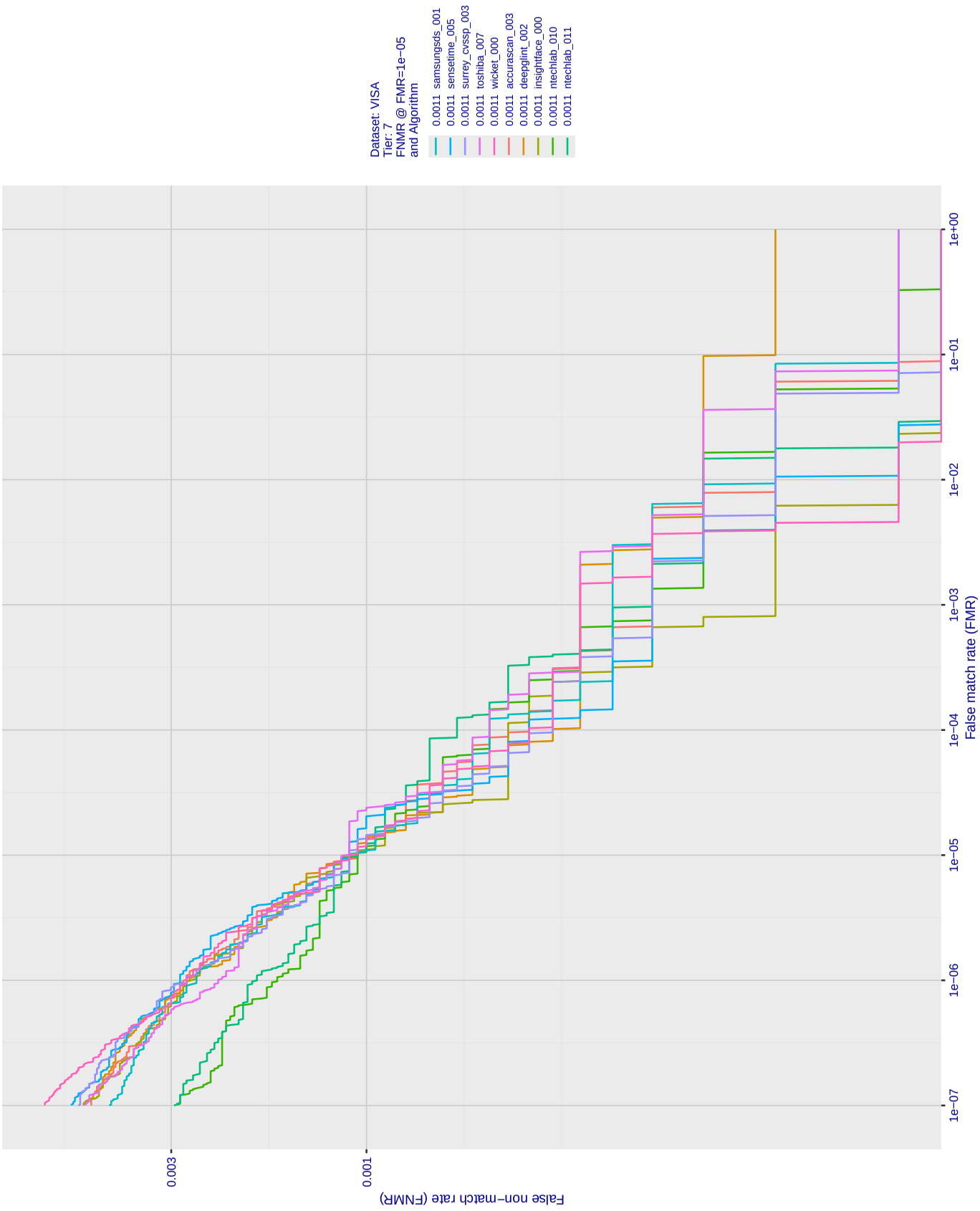

Figure 111: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

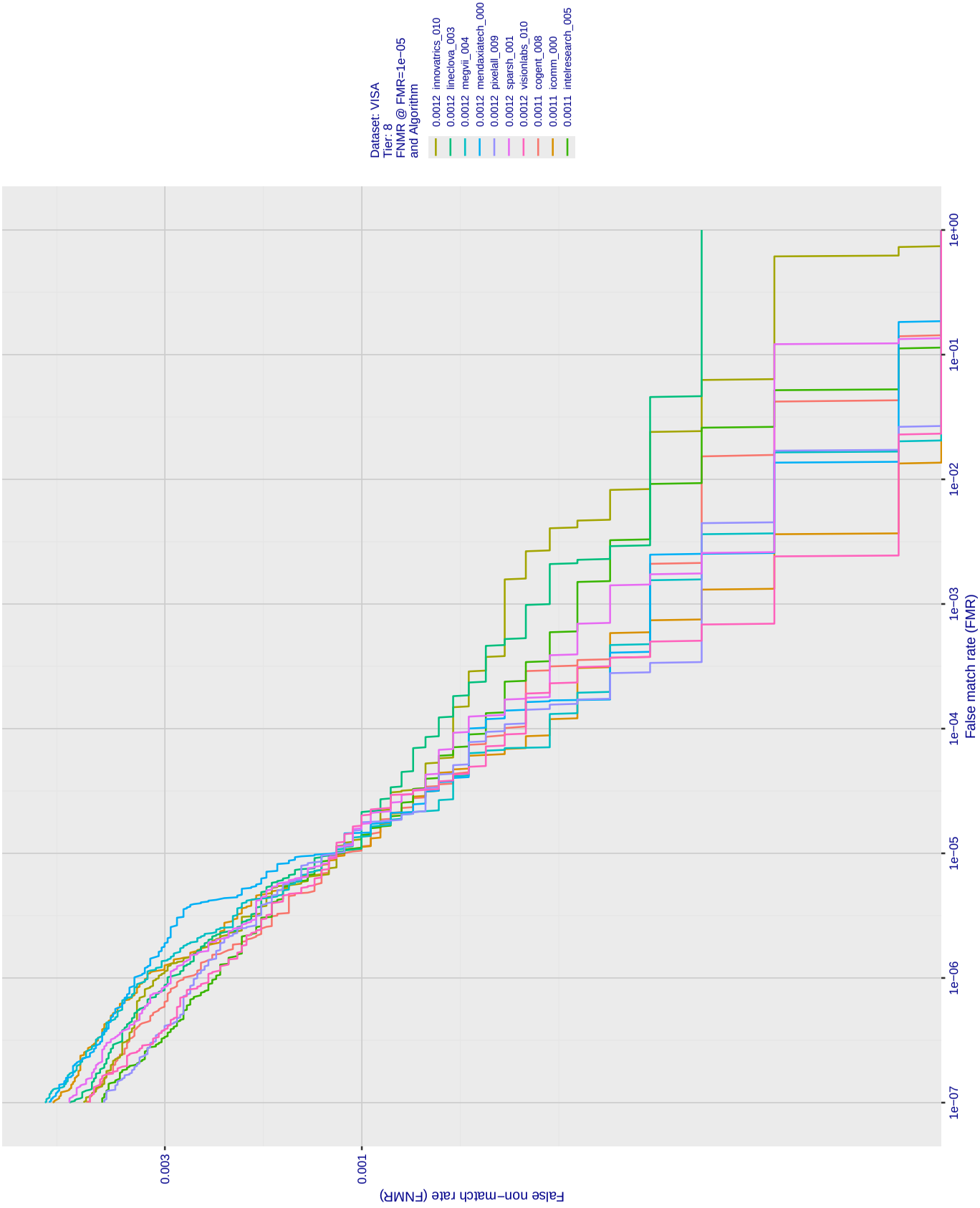

Figure 112: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

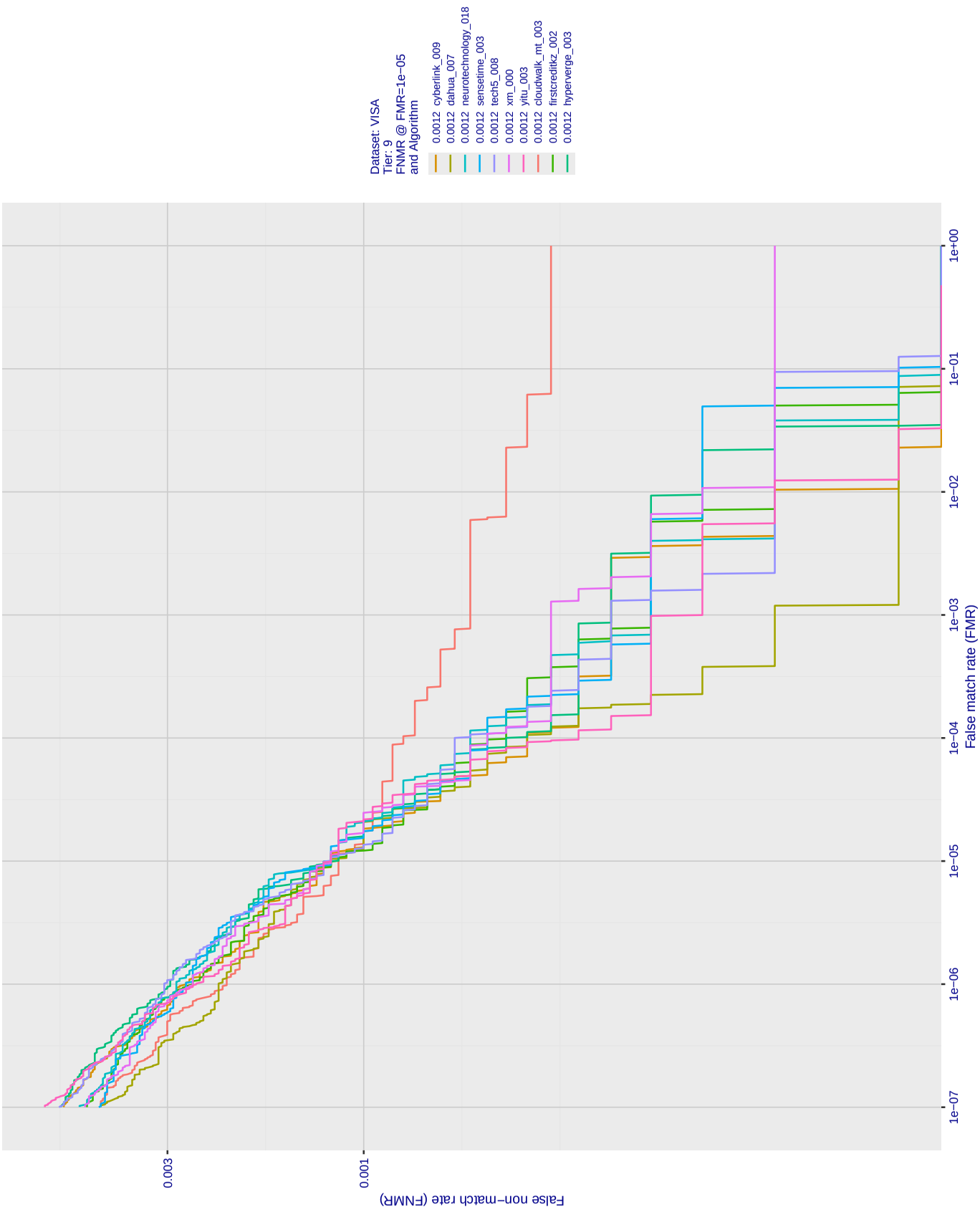

Figure 113: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

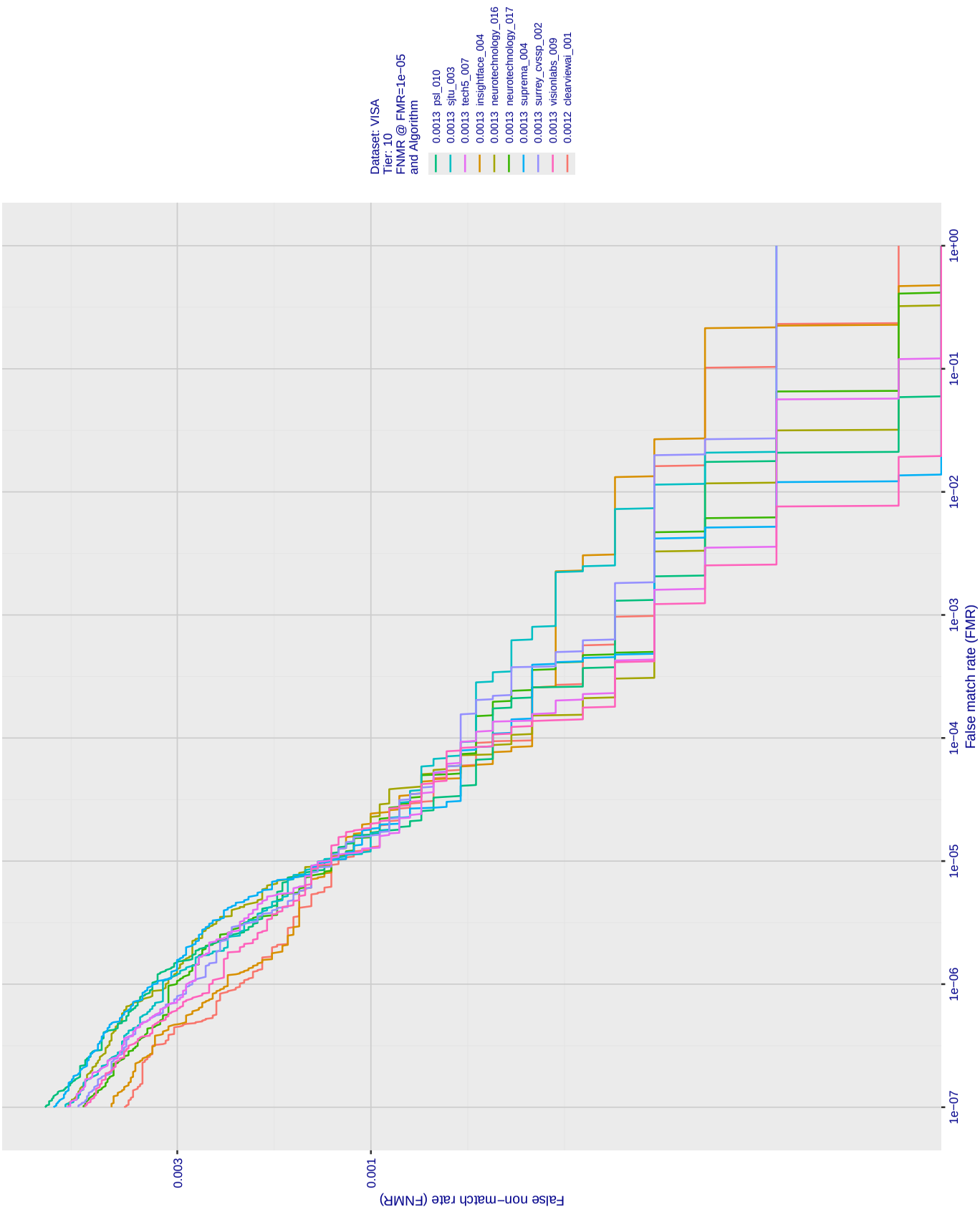

Figure 114: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

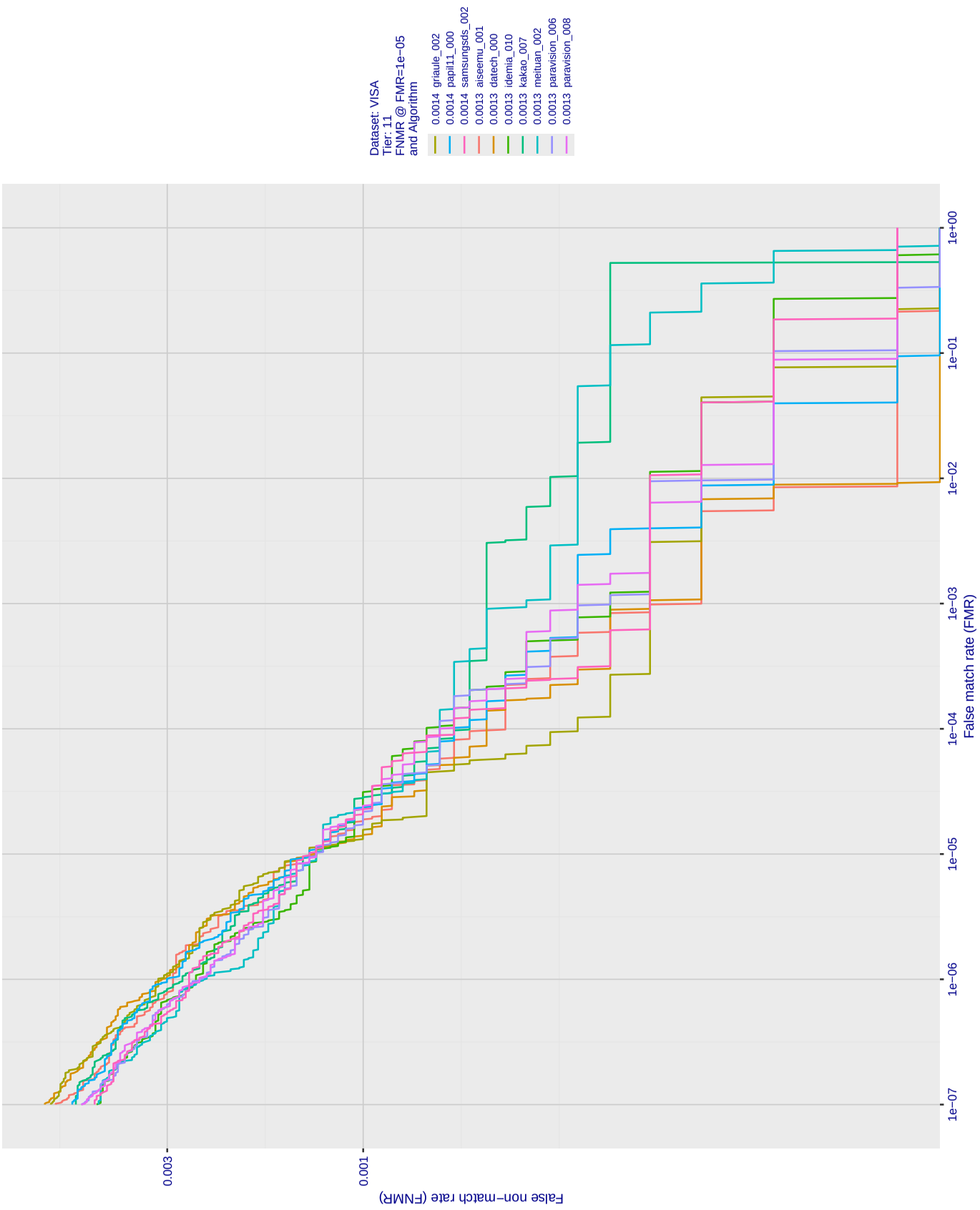

Figure 115: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

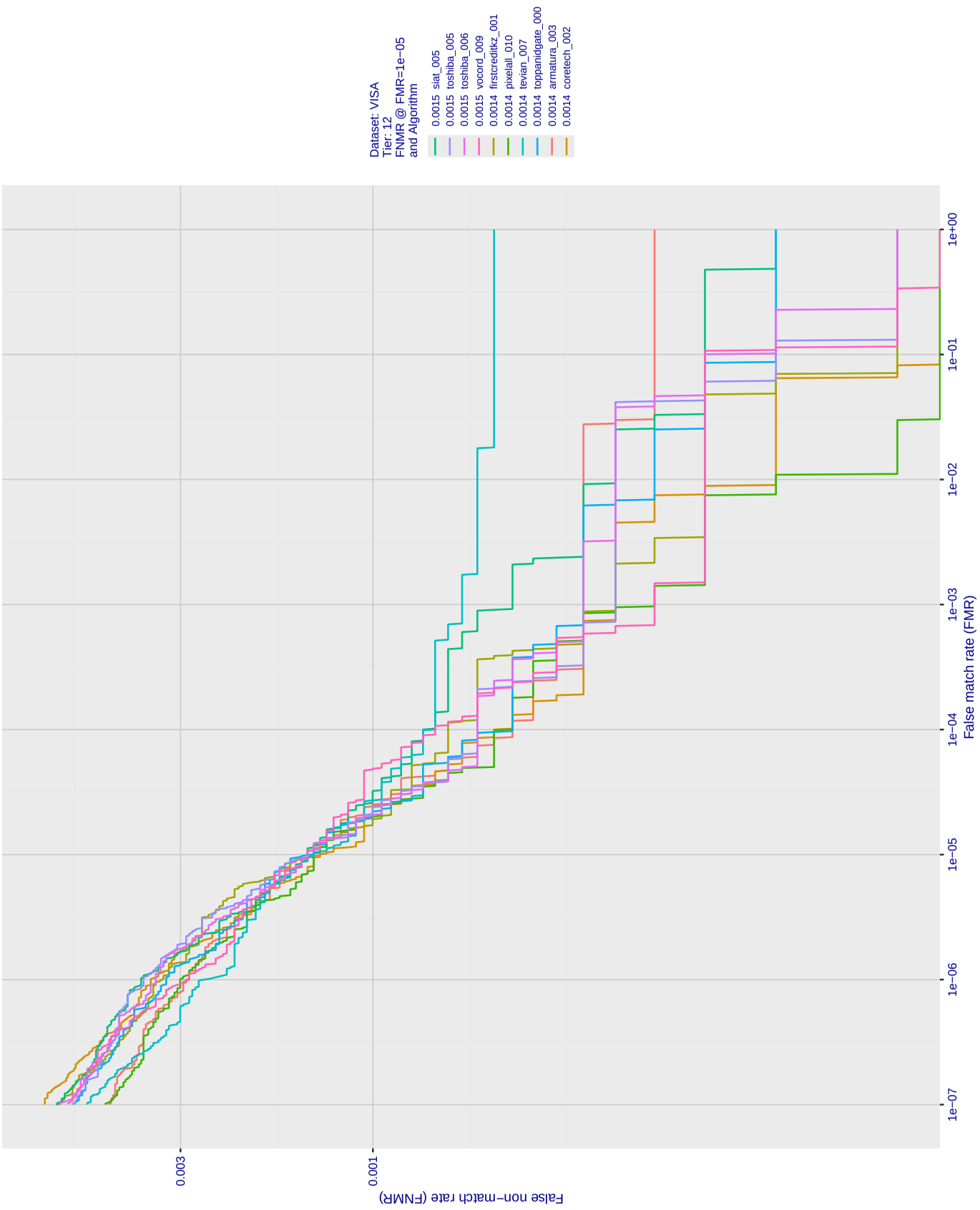

Figure 116: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

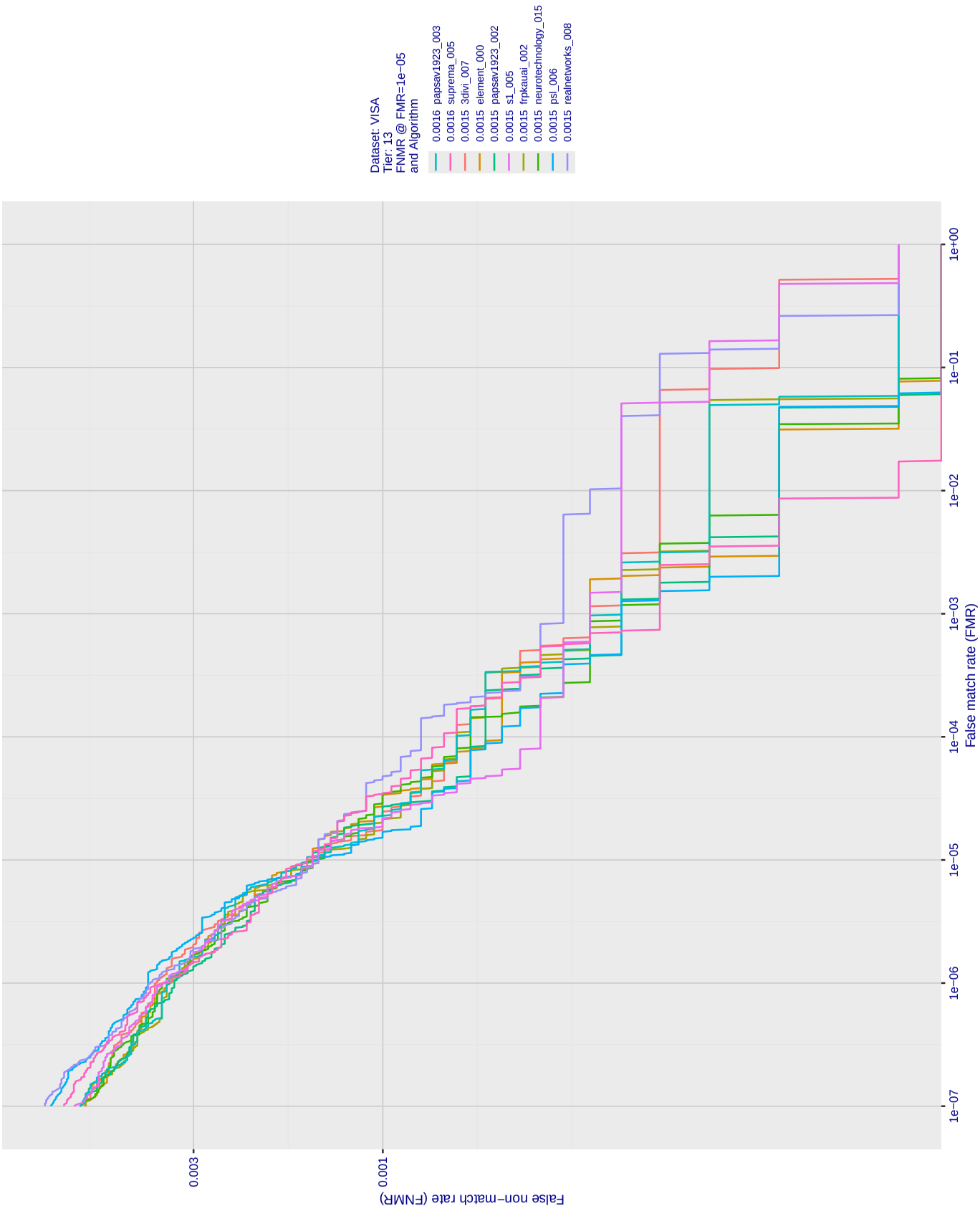

Figure 117: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

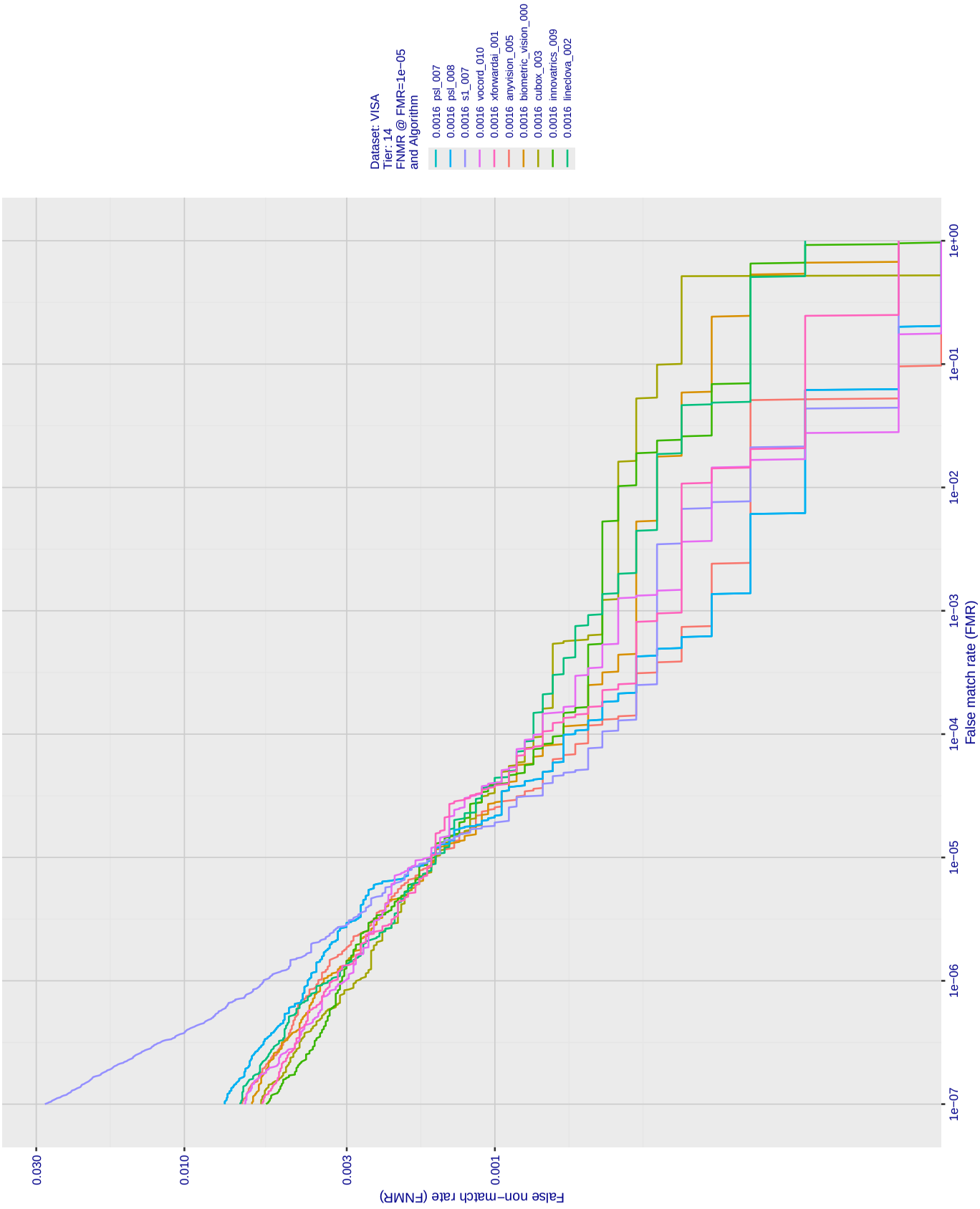

Figure 118: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

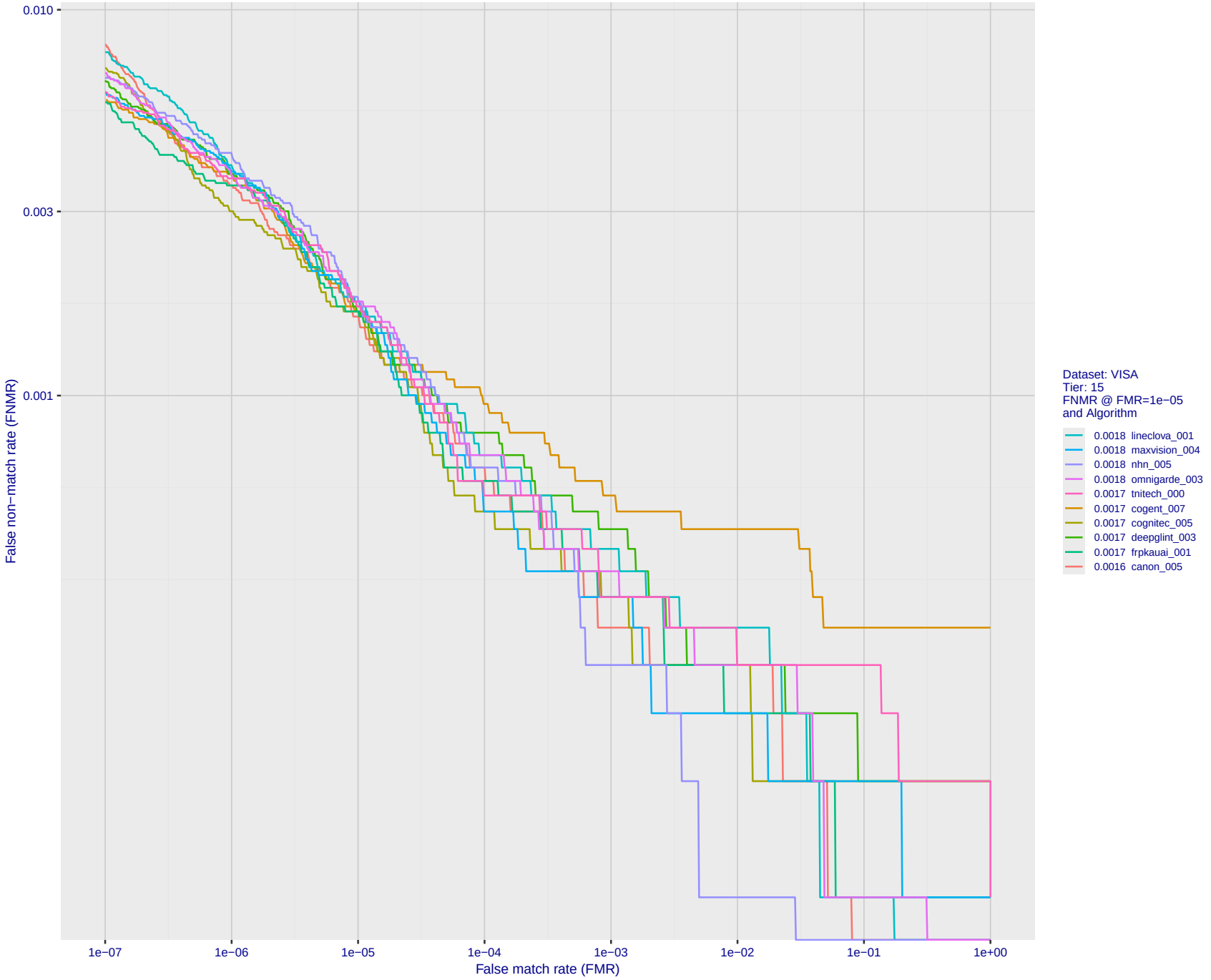

Figure 119: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

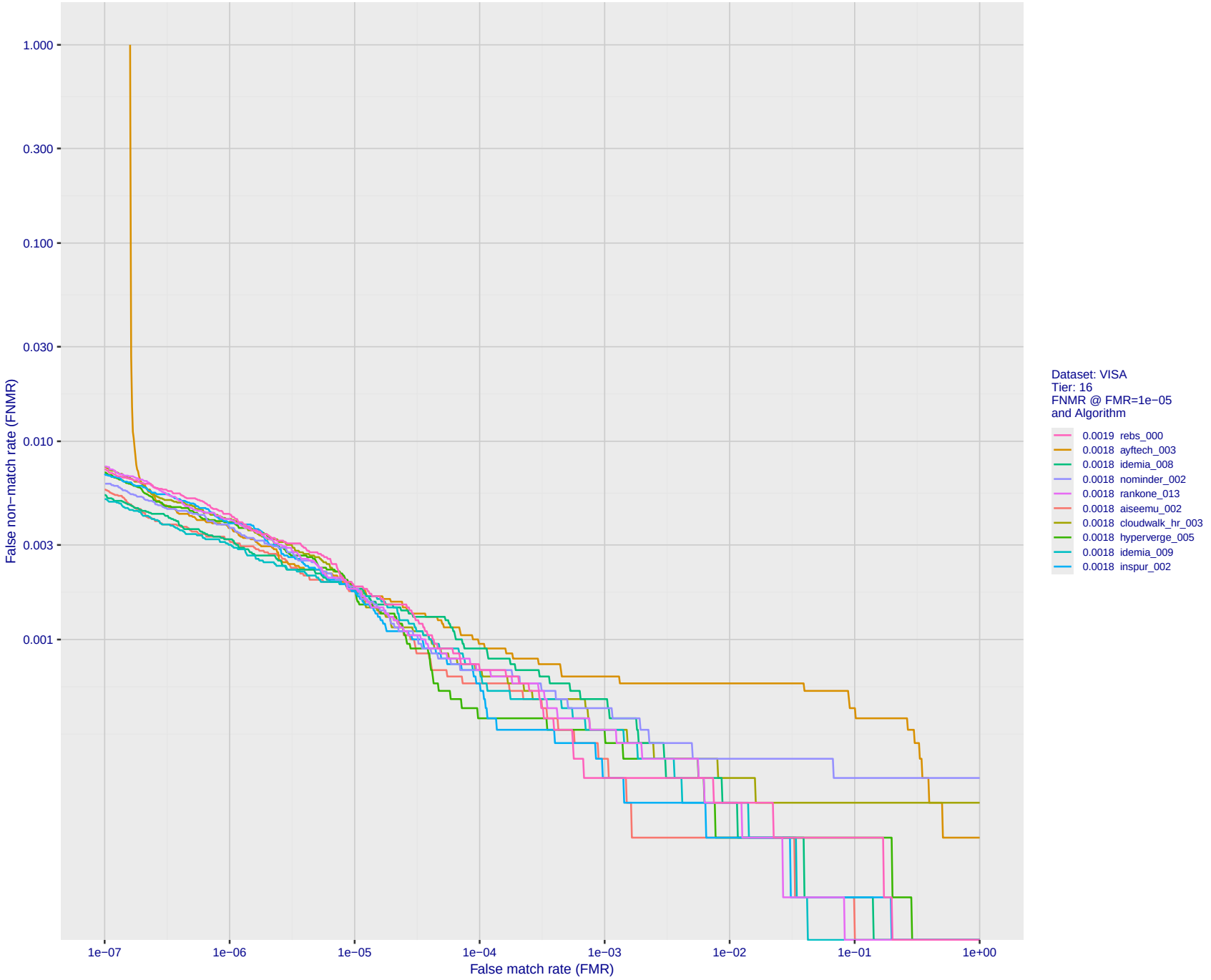

Figure 120: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

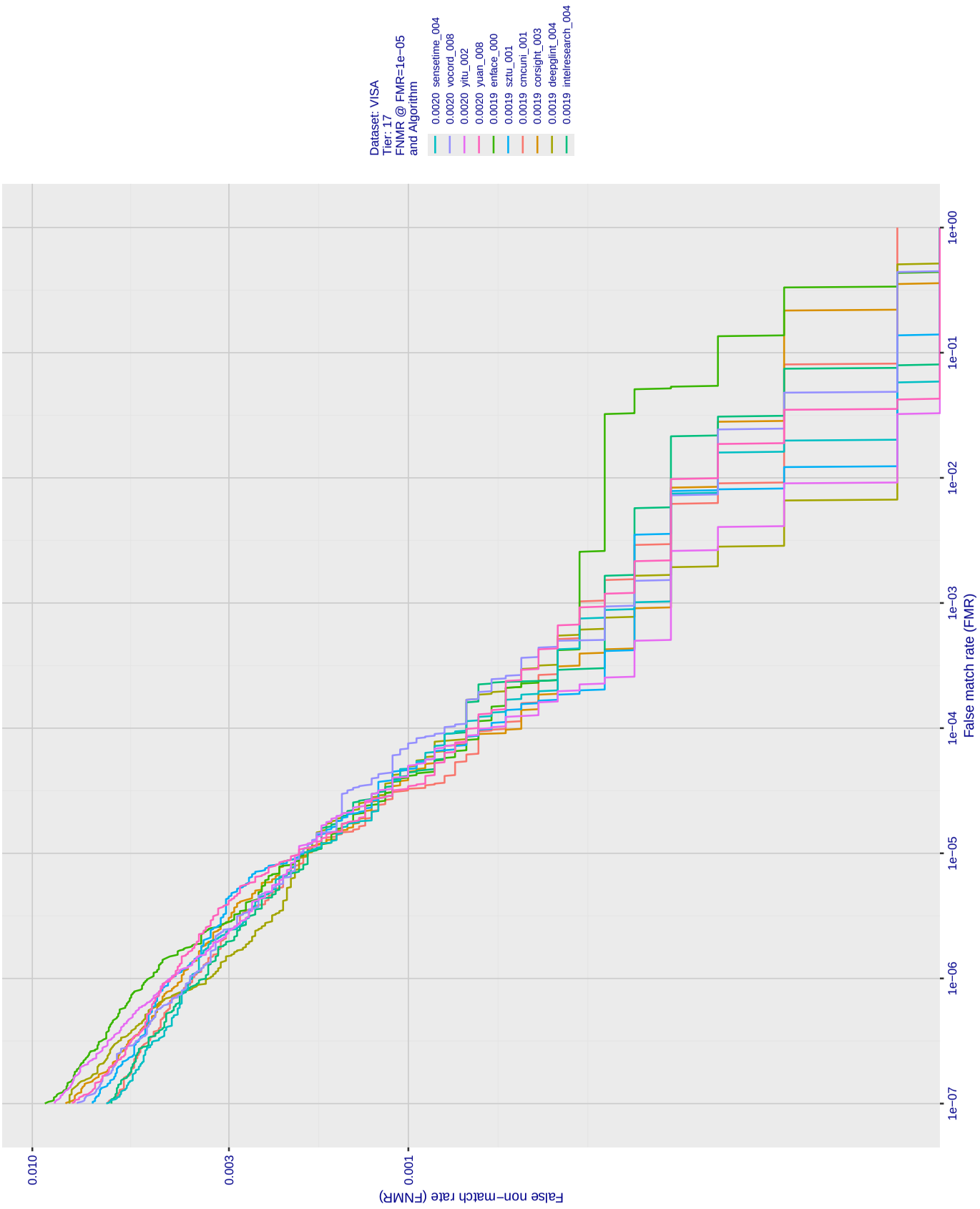

Figure 121: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

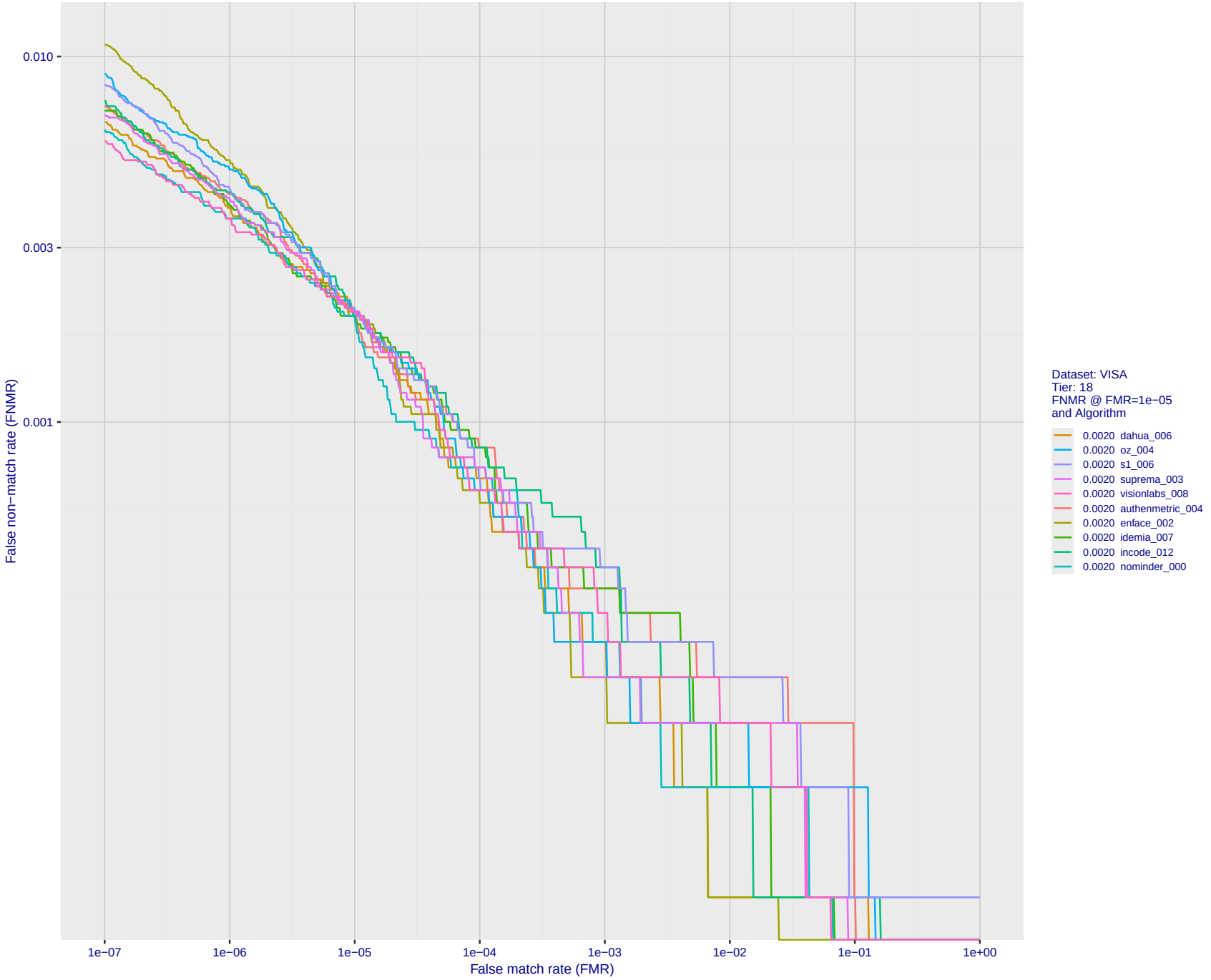

Figure 122: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

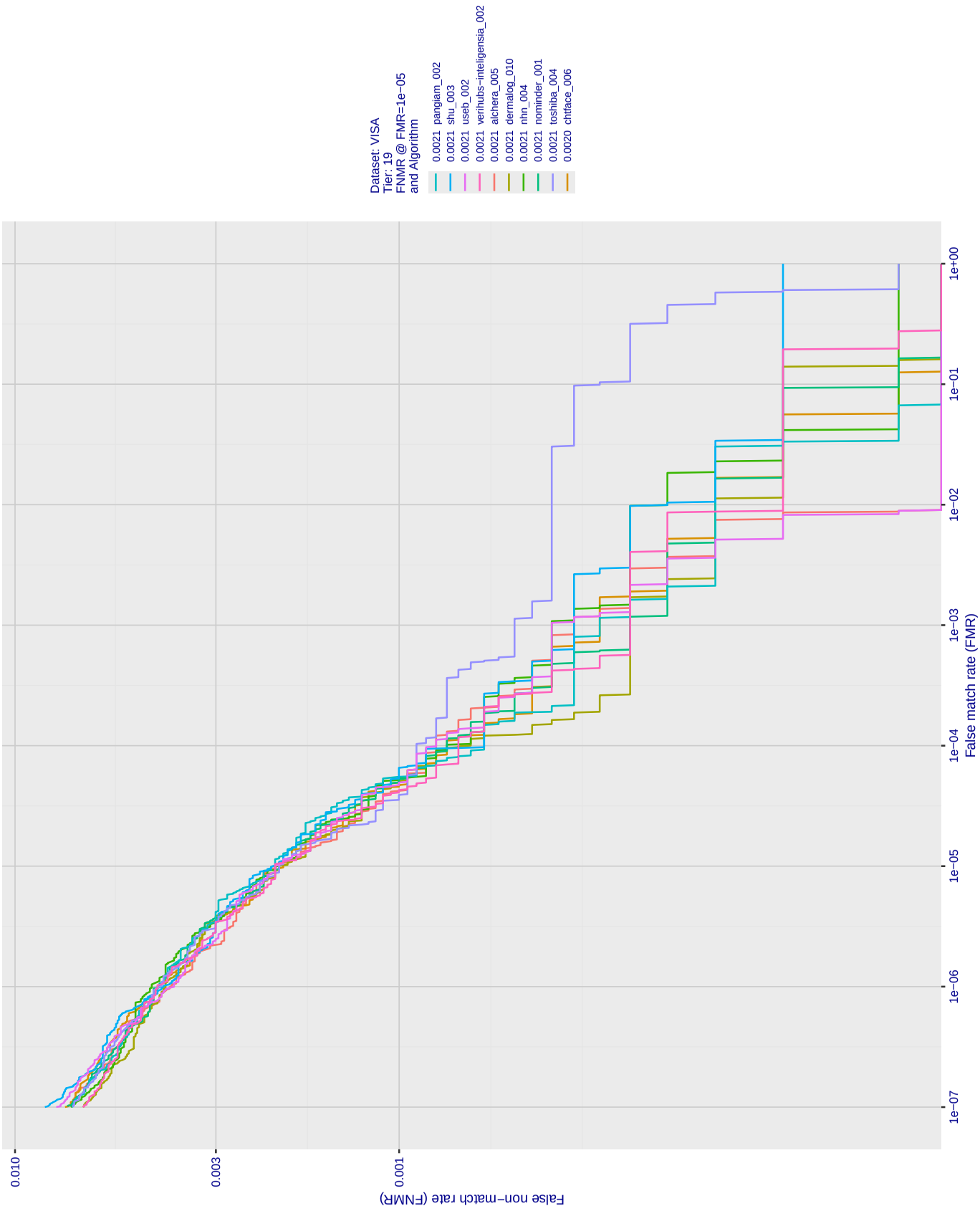

Figure 123: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

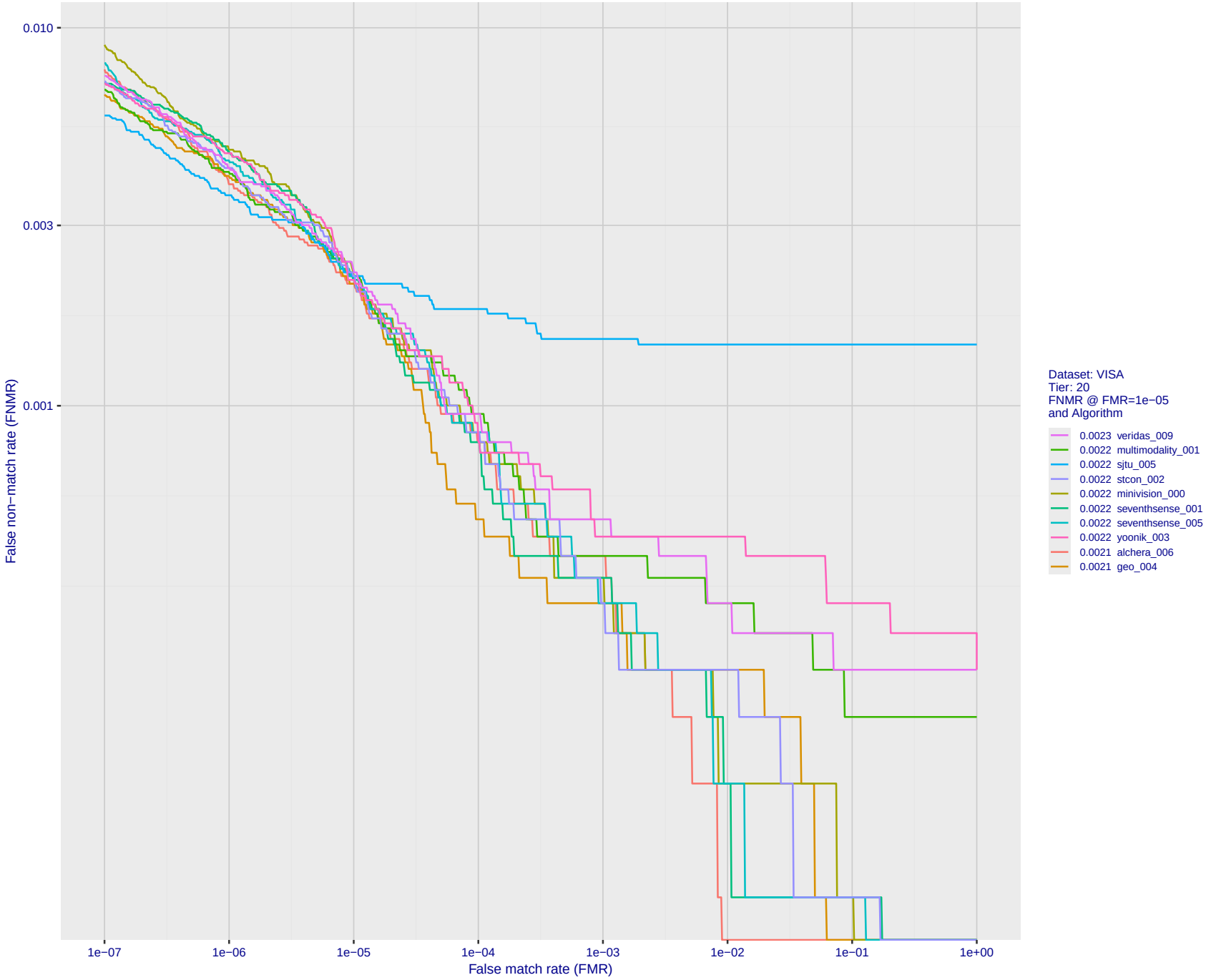

Figure 124: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

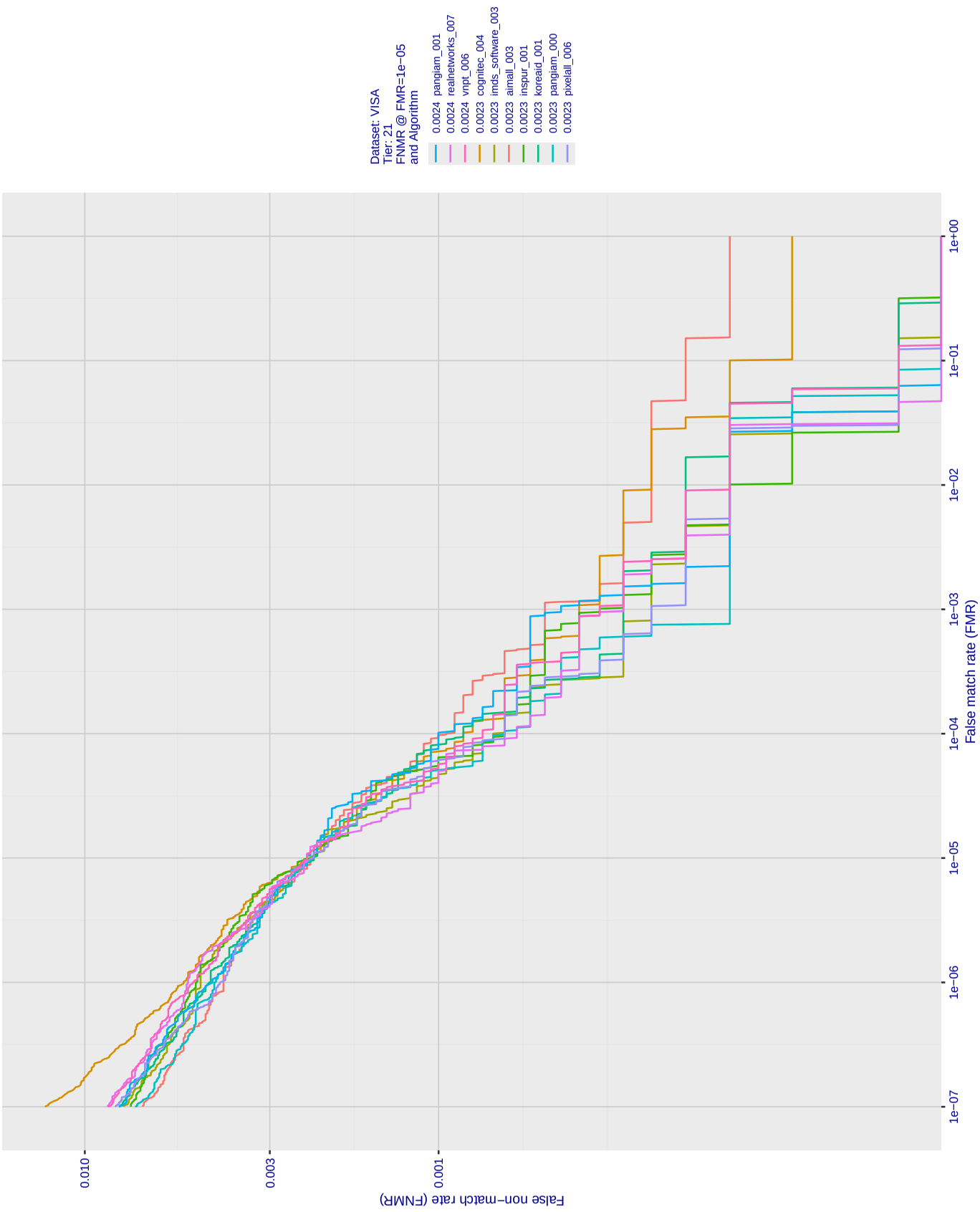

Figure 125: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

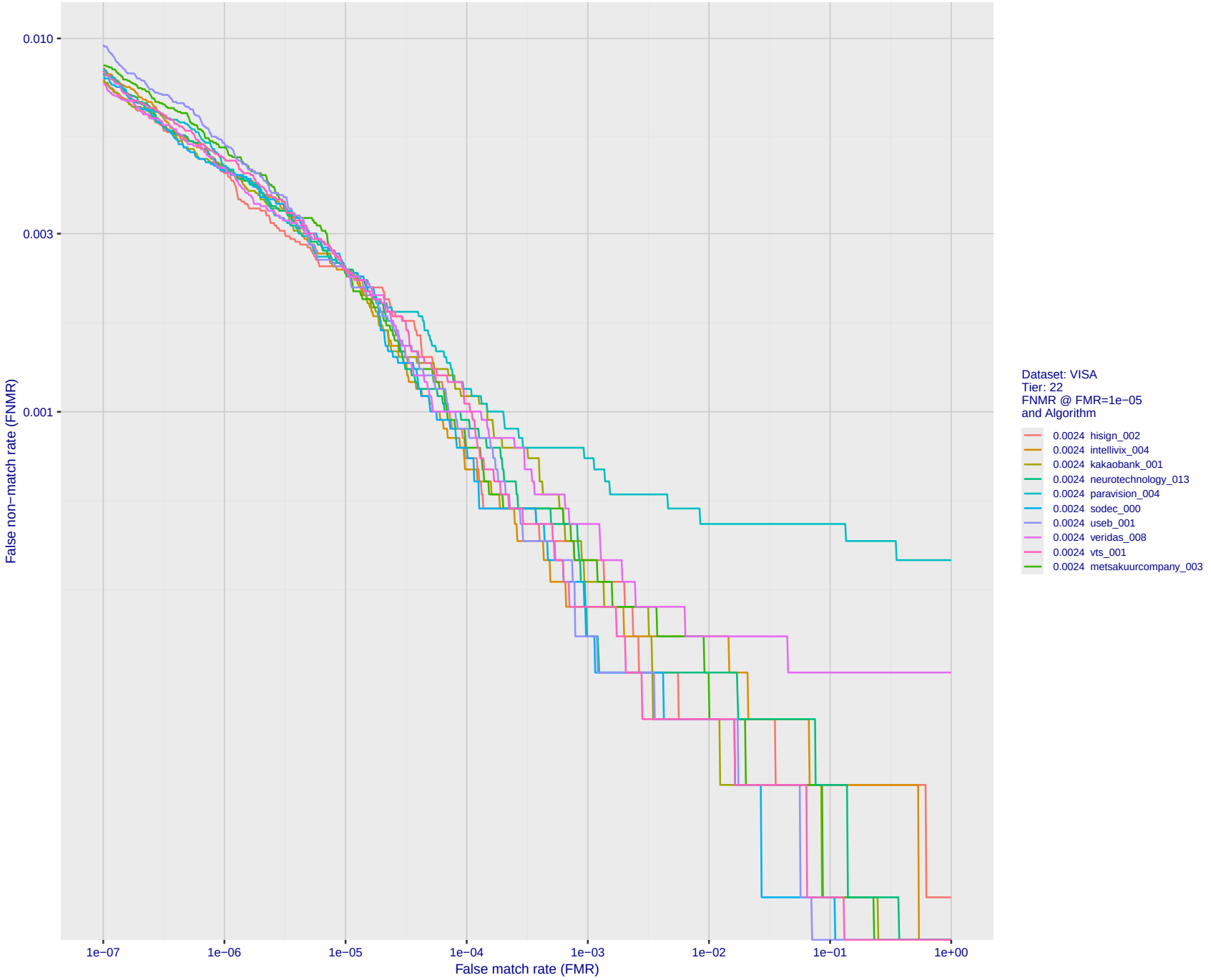

Figure 126: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

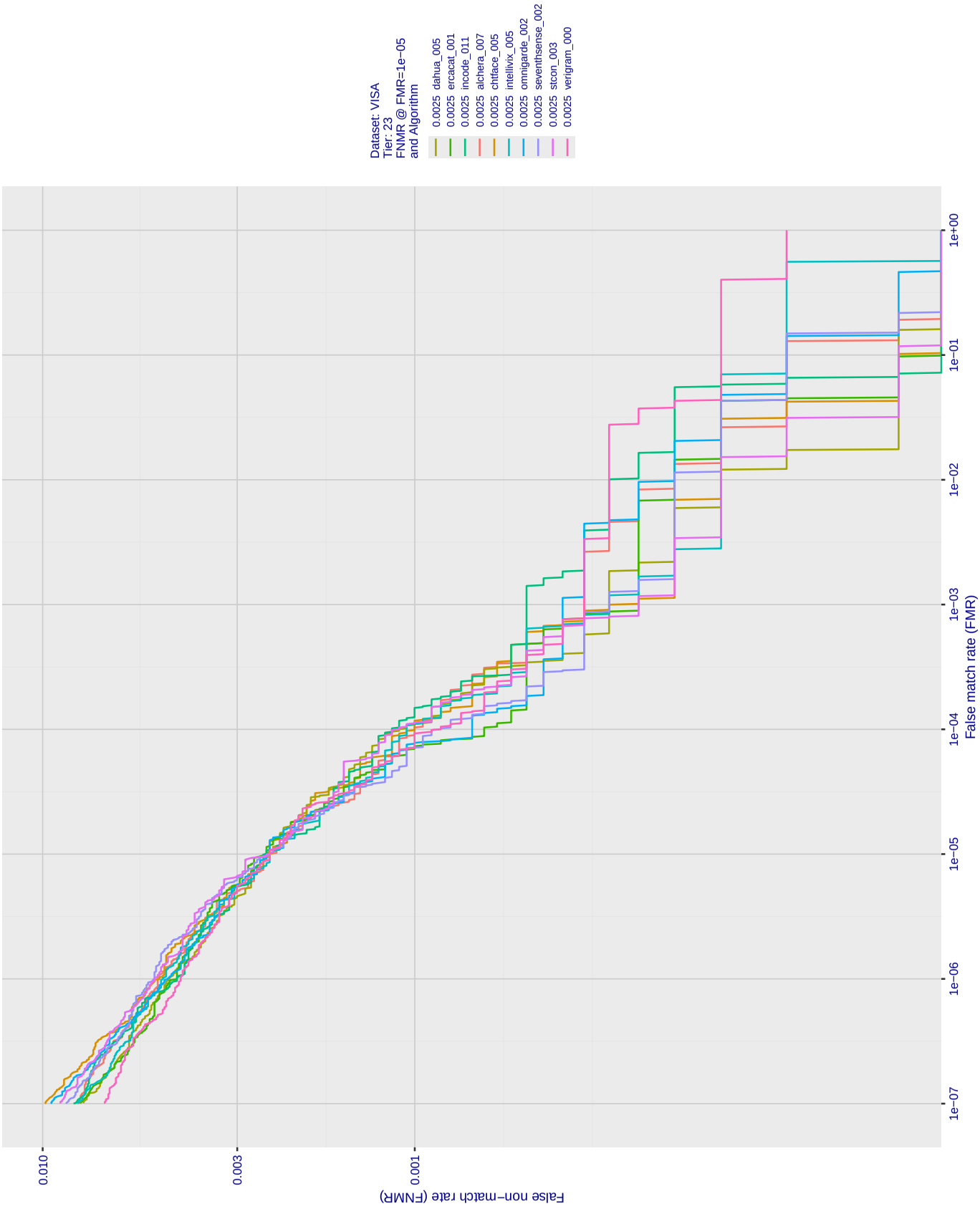

Figure 127: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

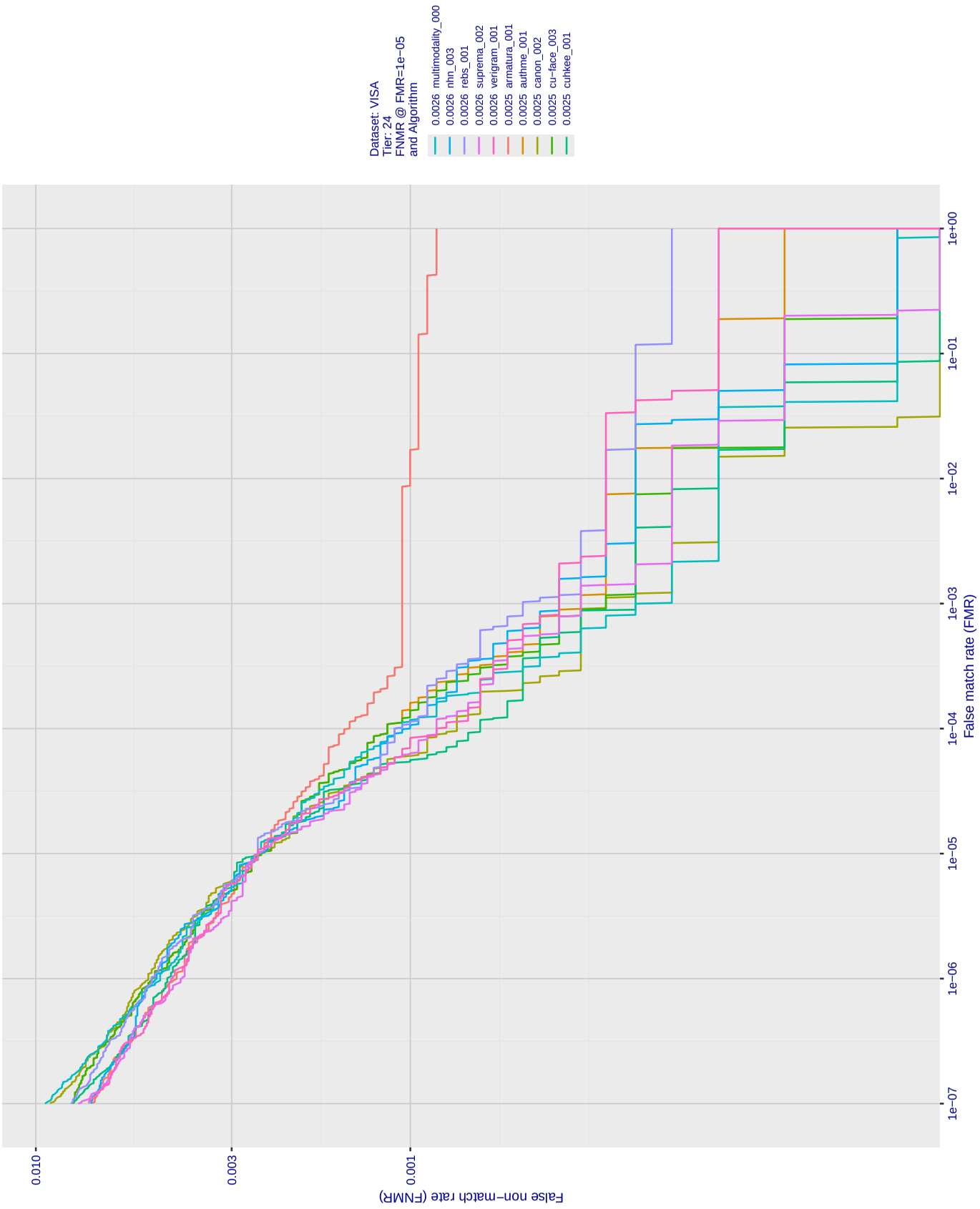

Figure 128: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

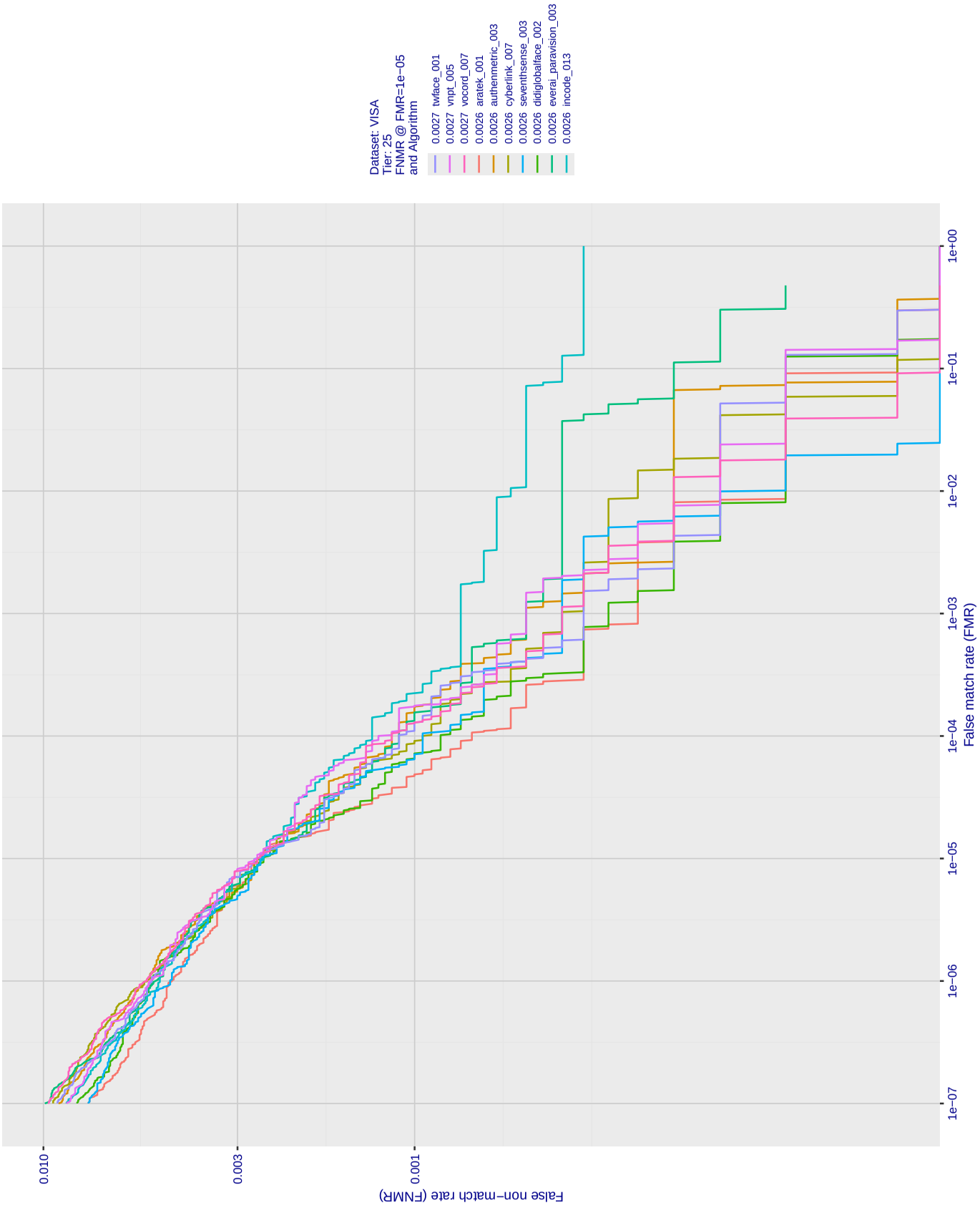

Figure 129: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

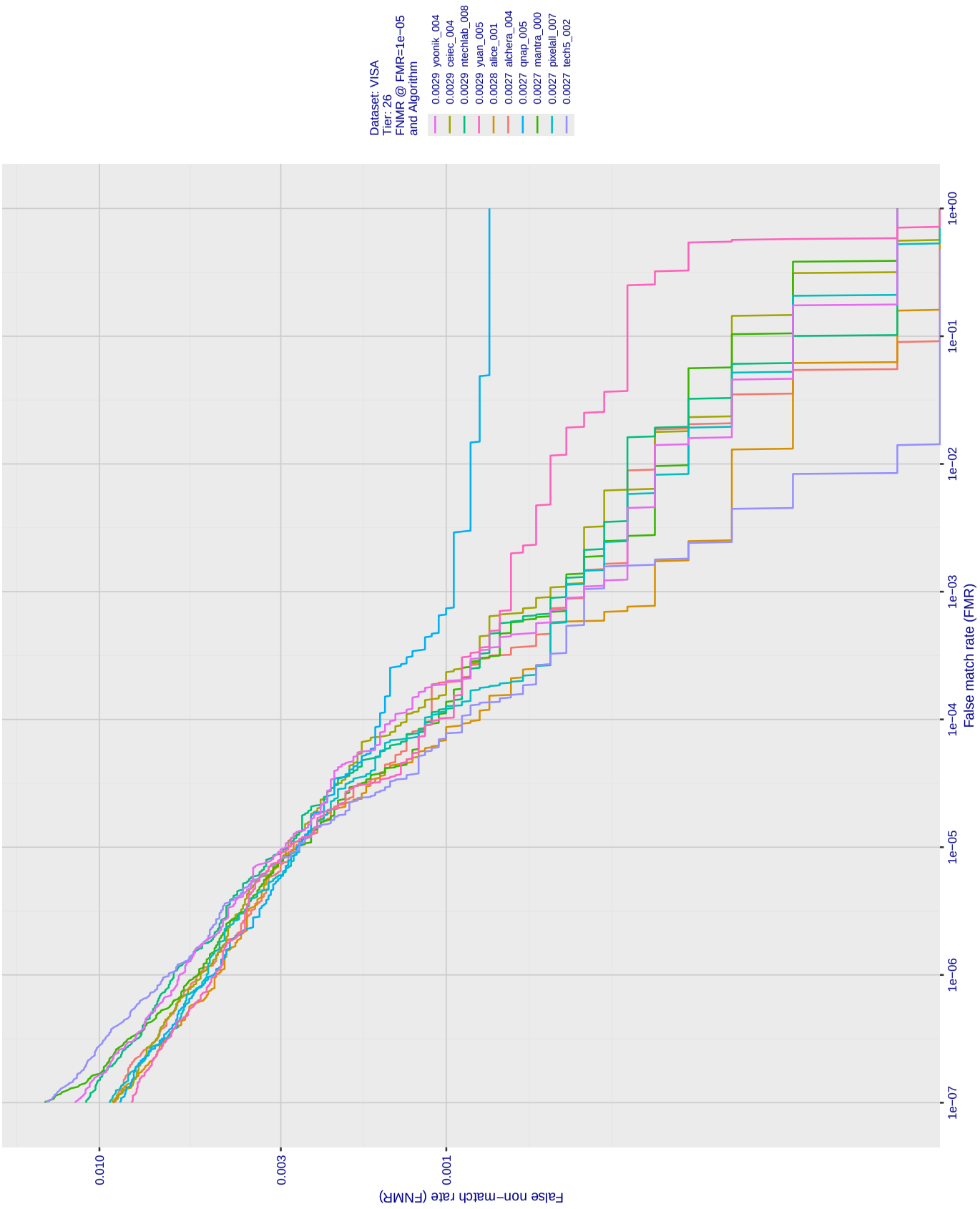

Figure 130: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

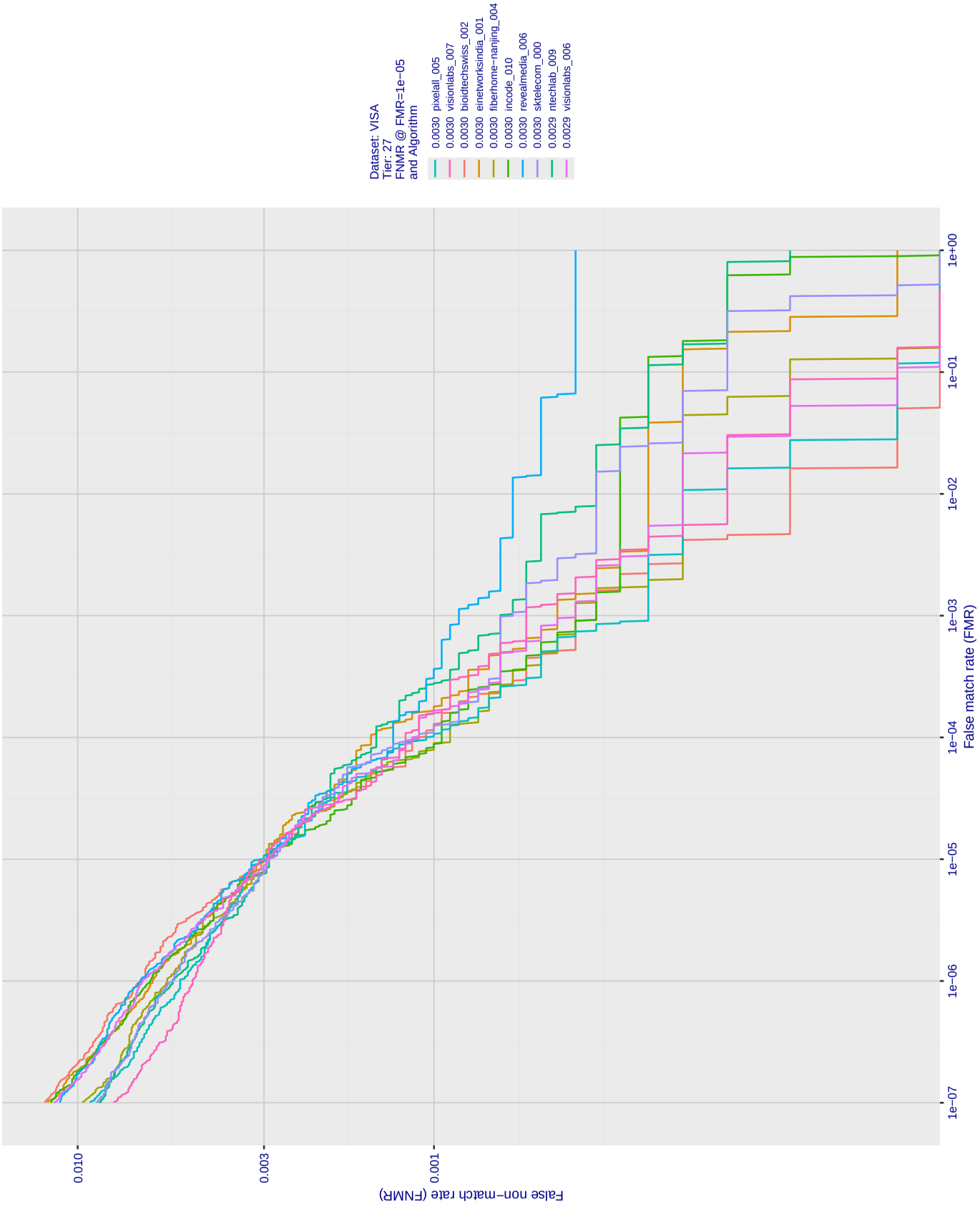

Figure 131: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

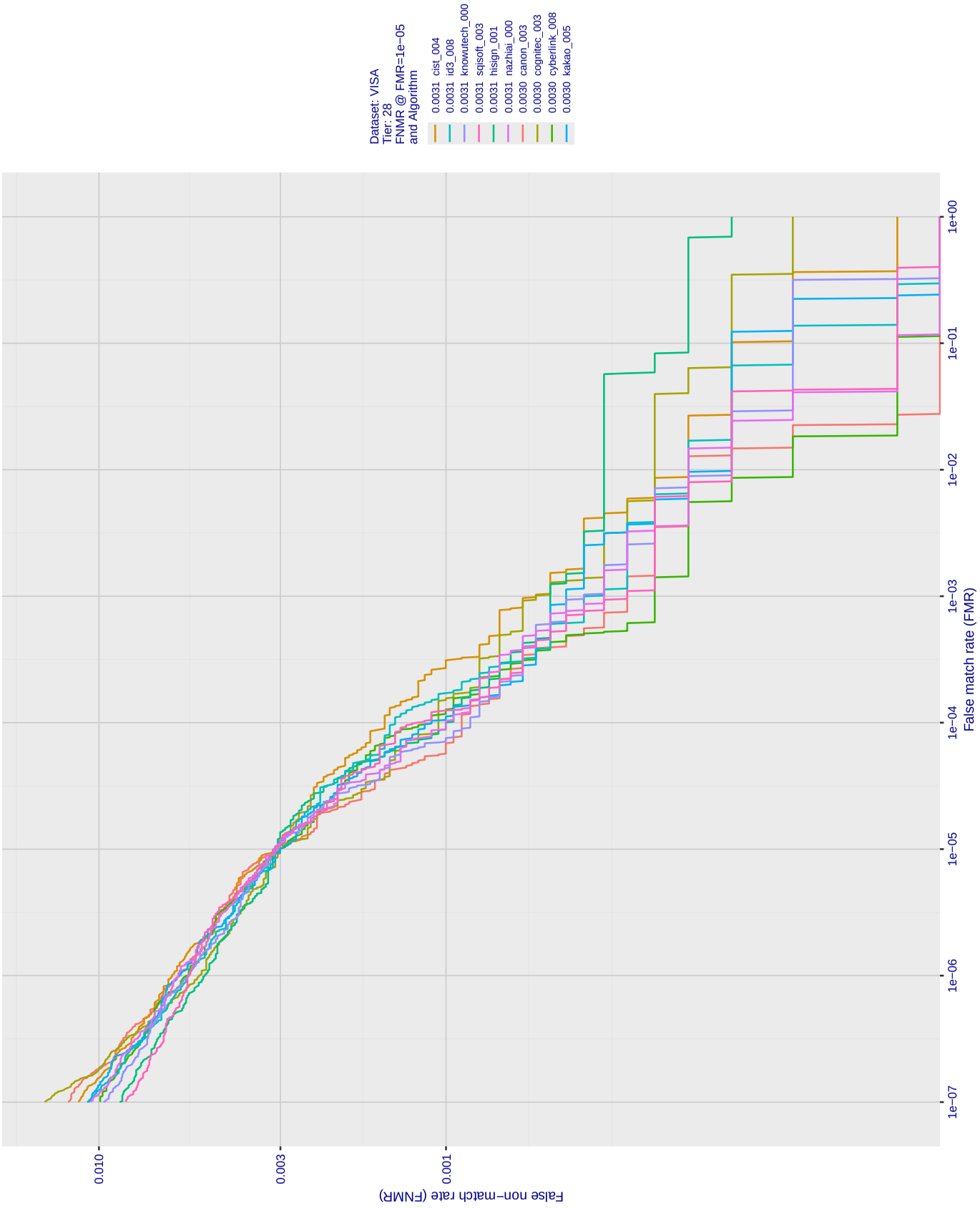

Figure 132: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

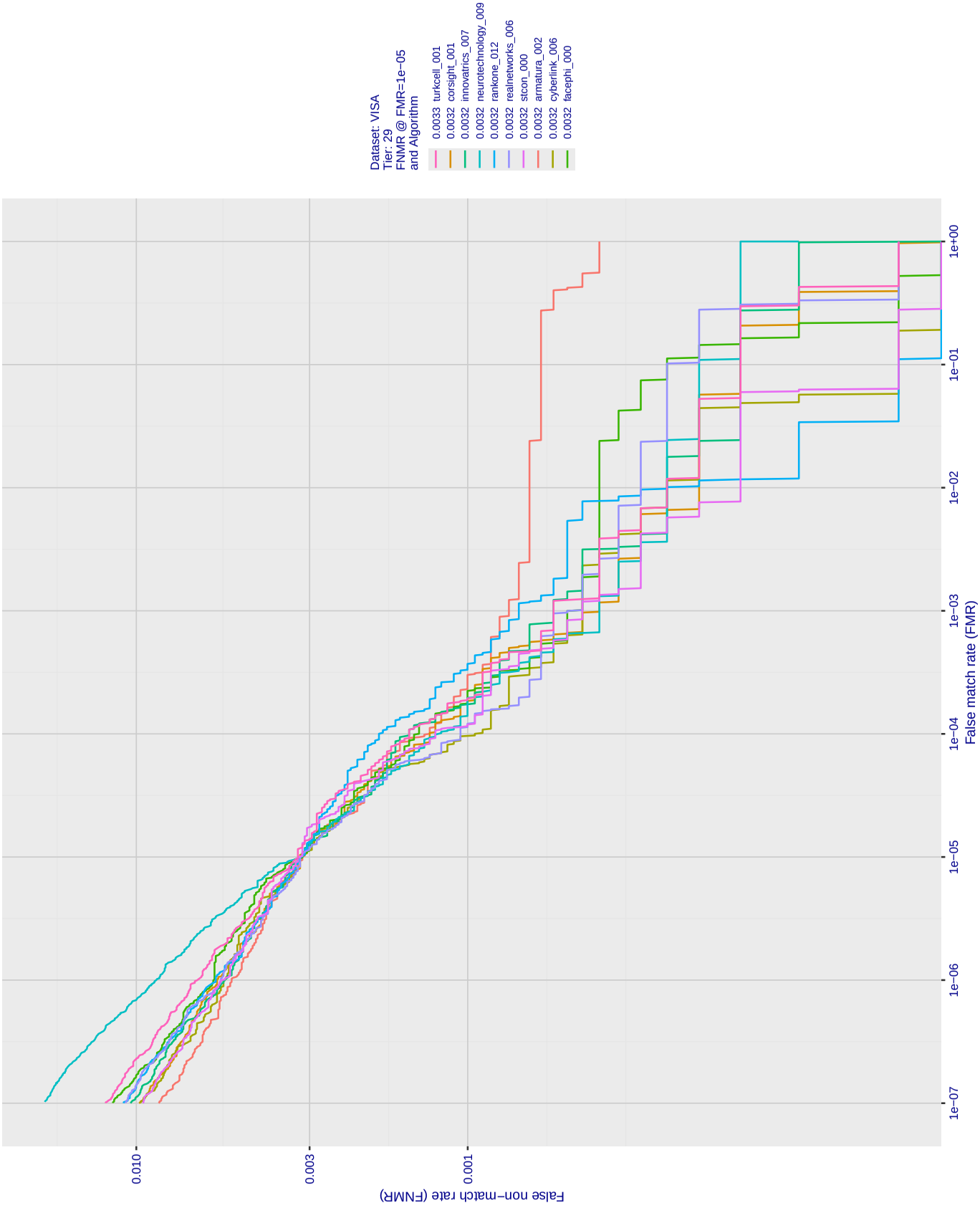

Figure 133: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

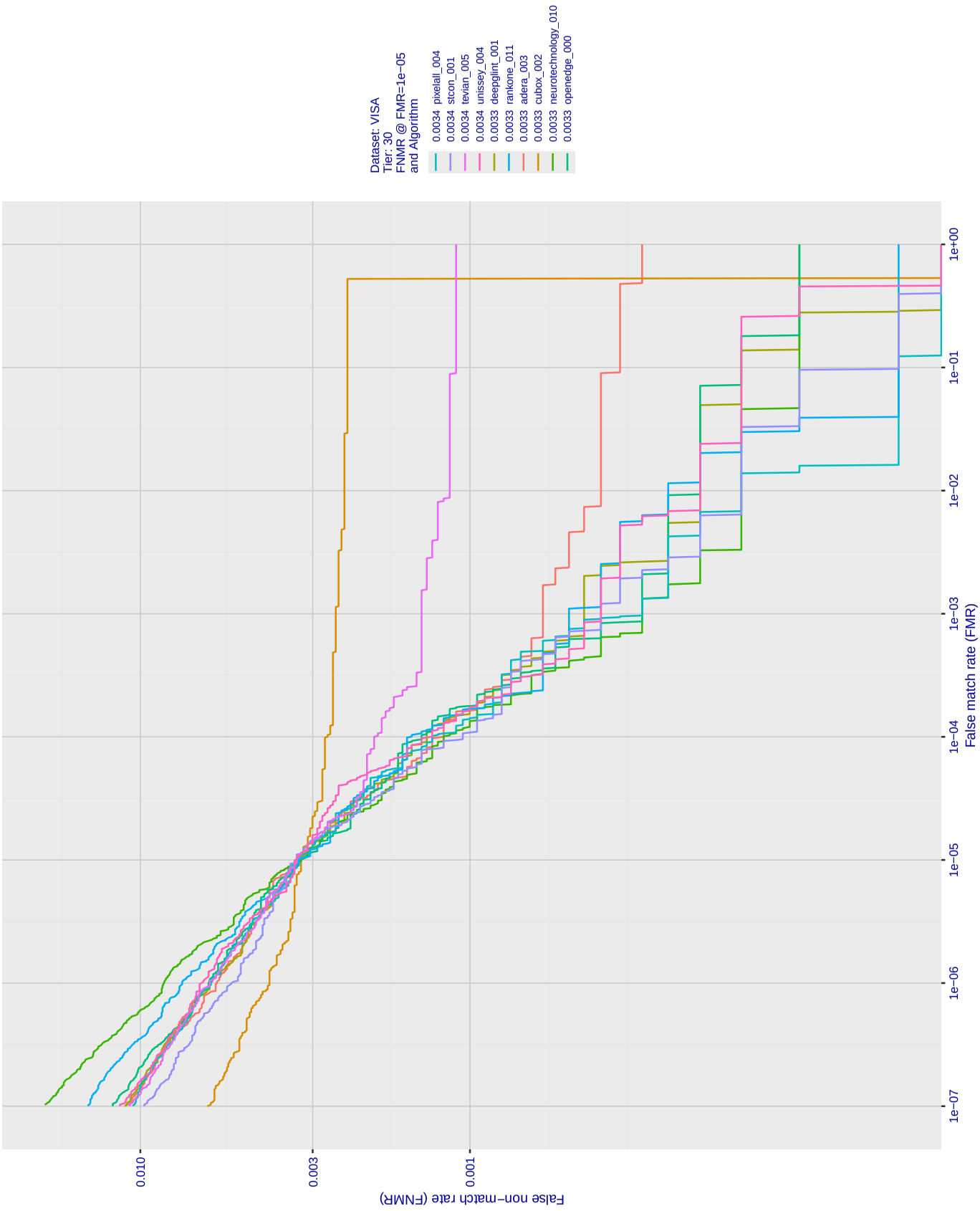

Figure 134: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

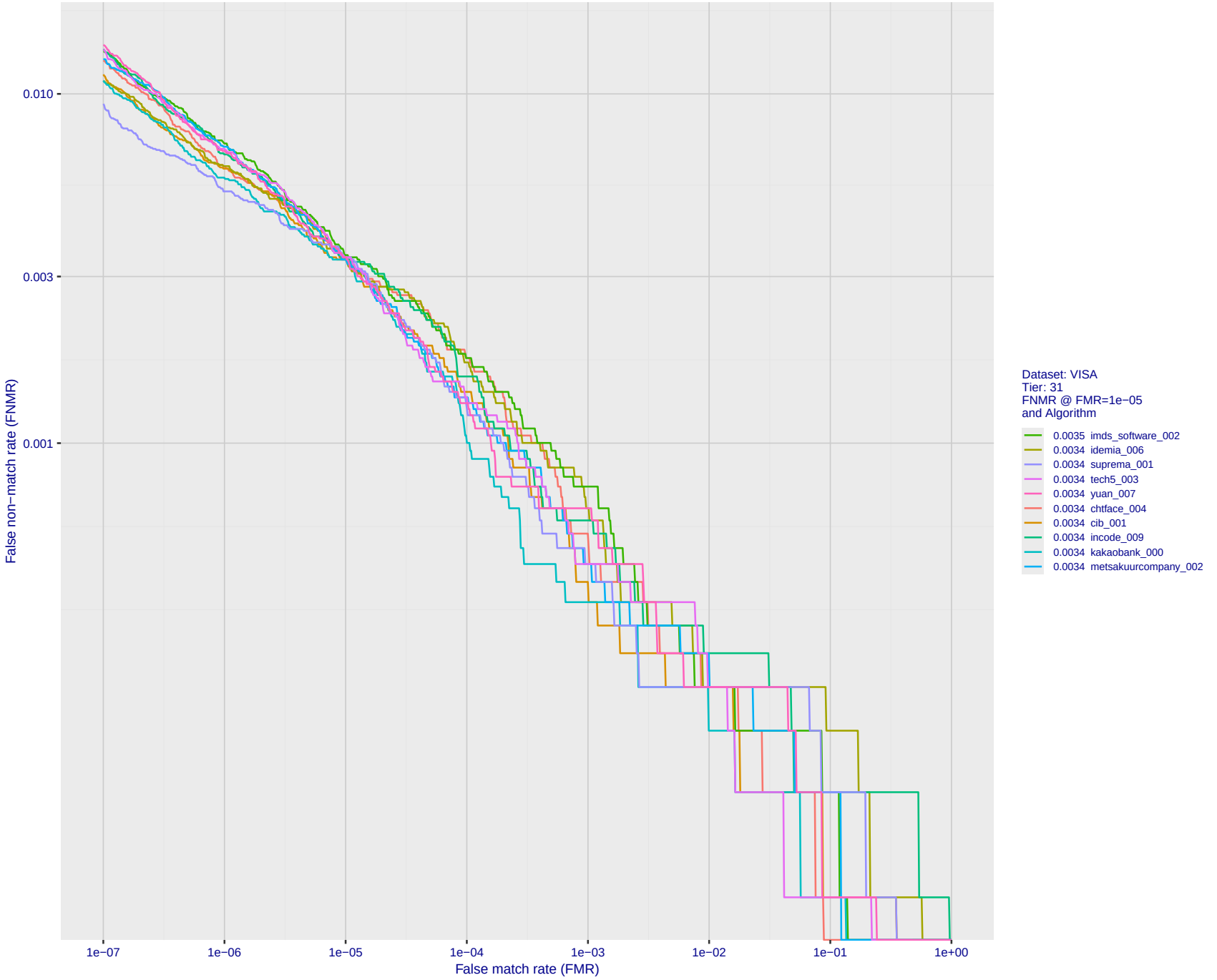

Figure 135: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

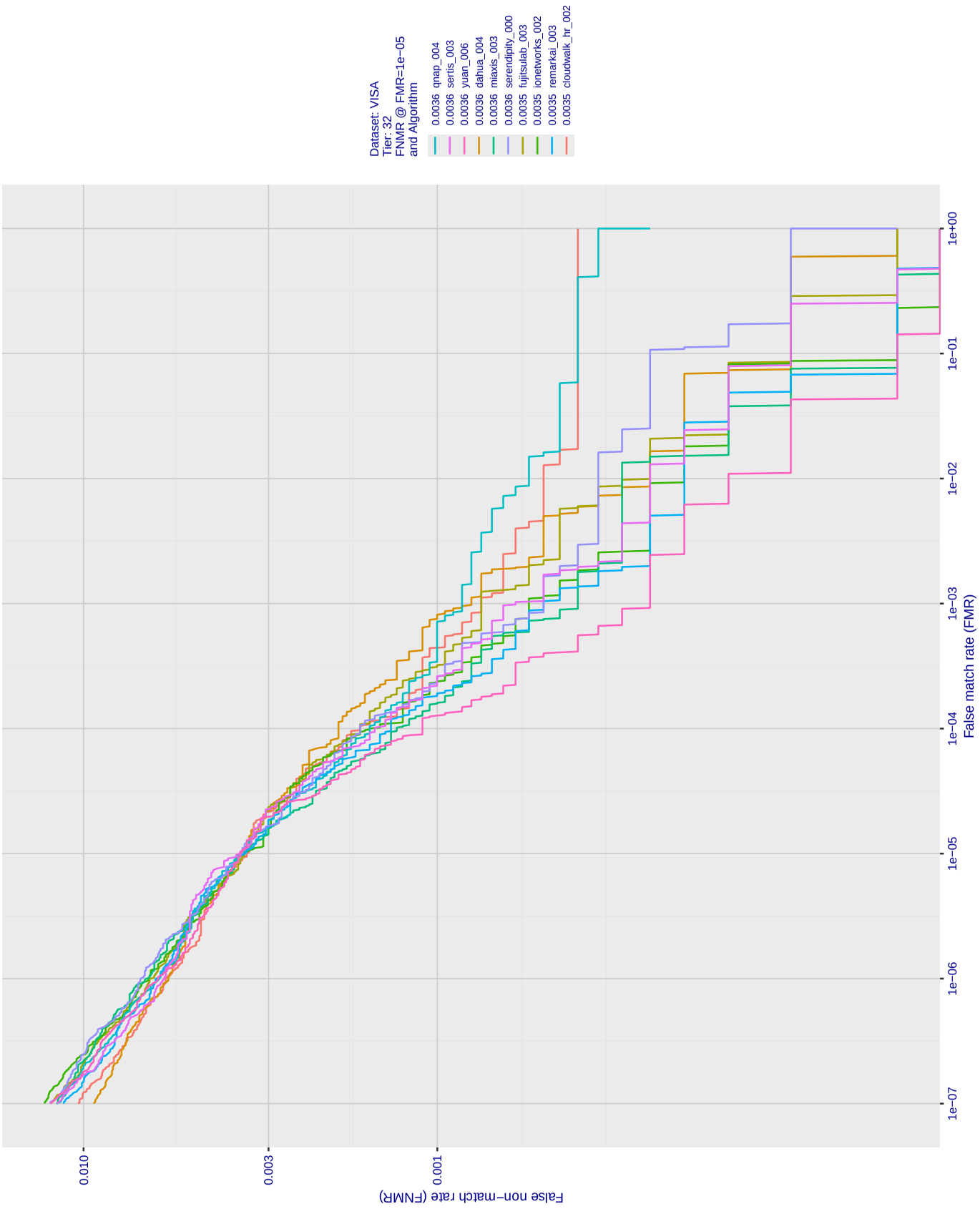

Figure 136: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

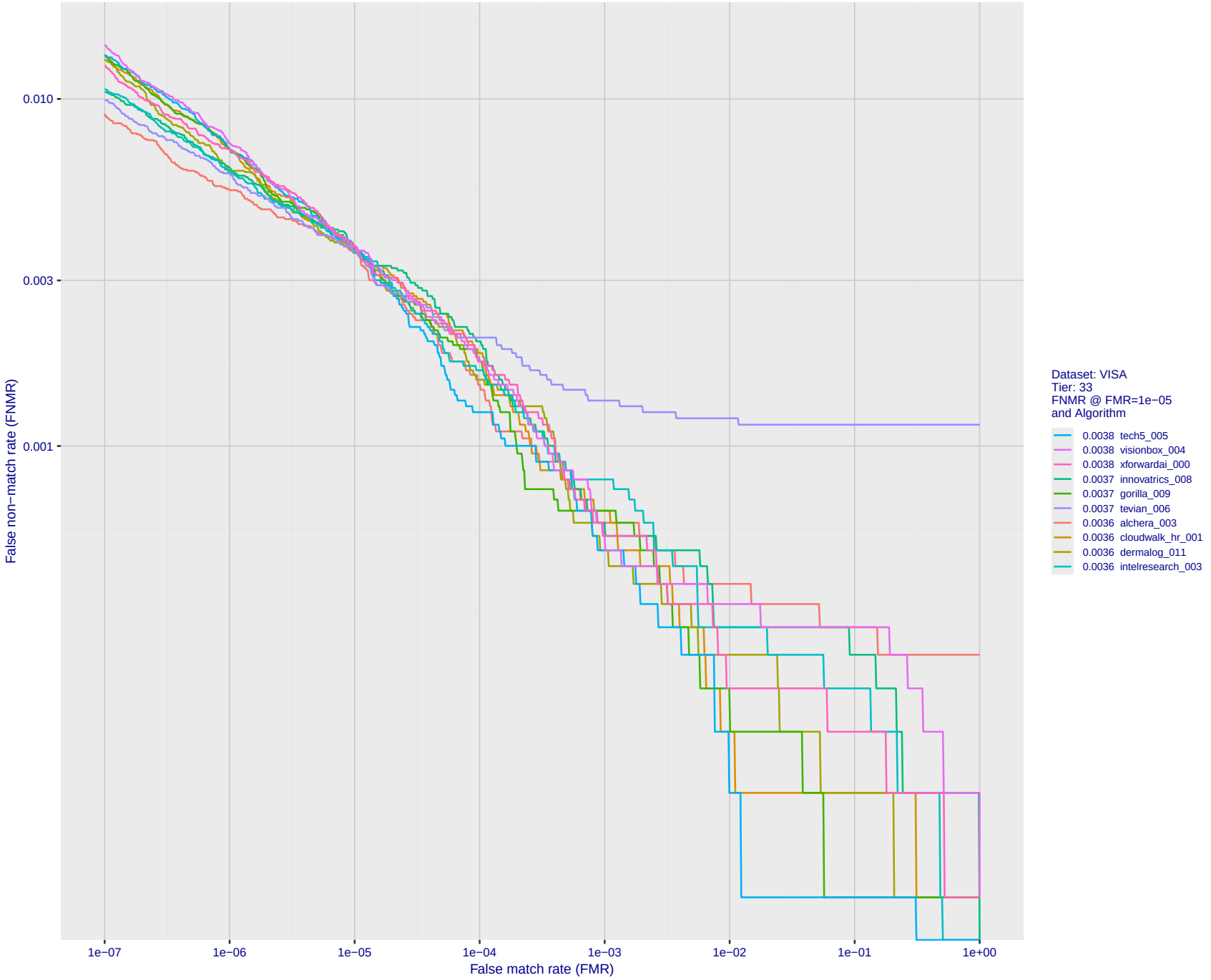

Figure 137: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

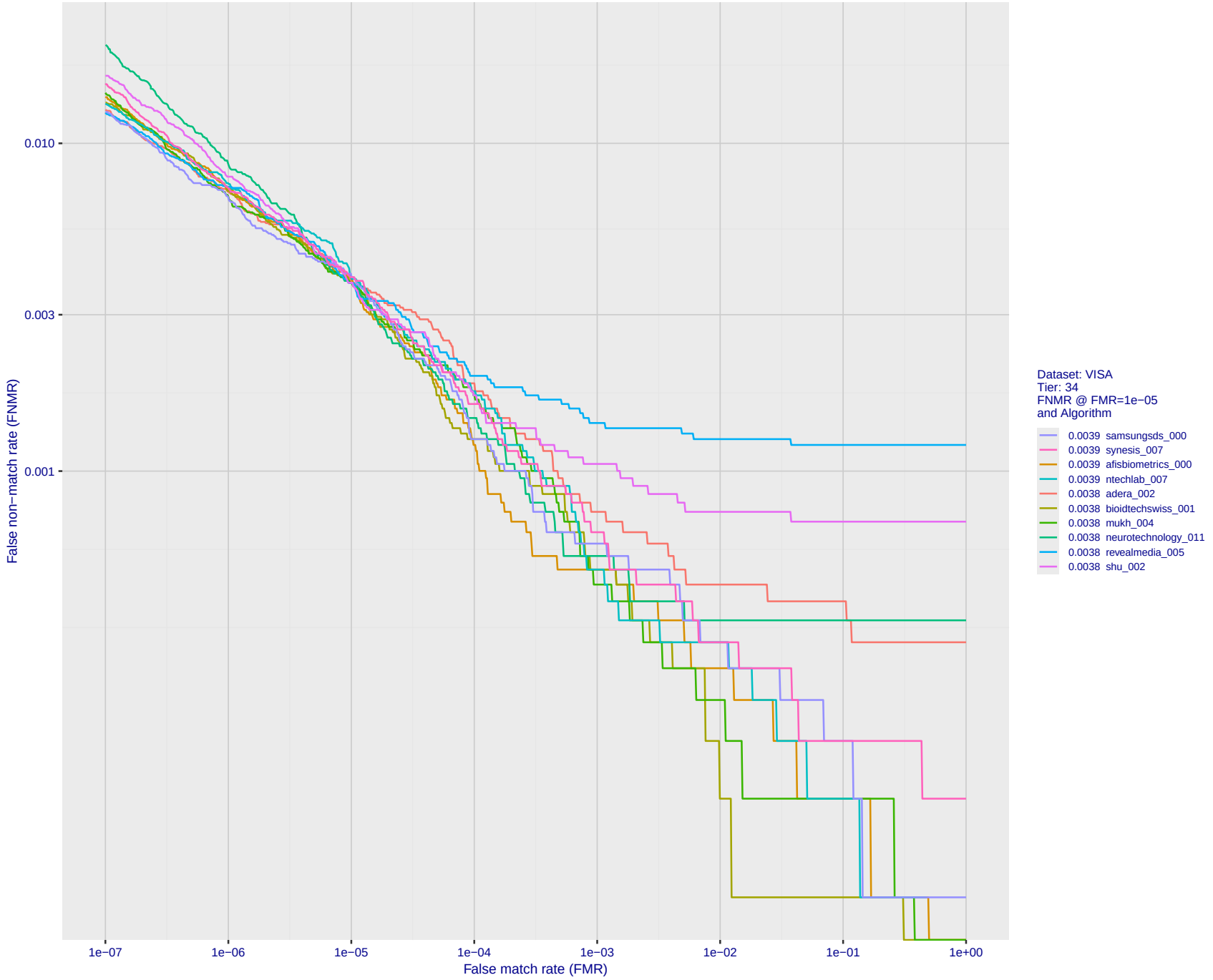

Figure 138: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

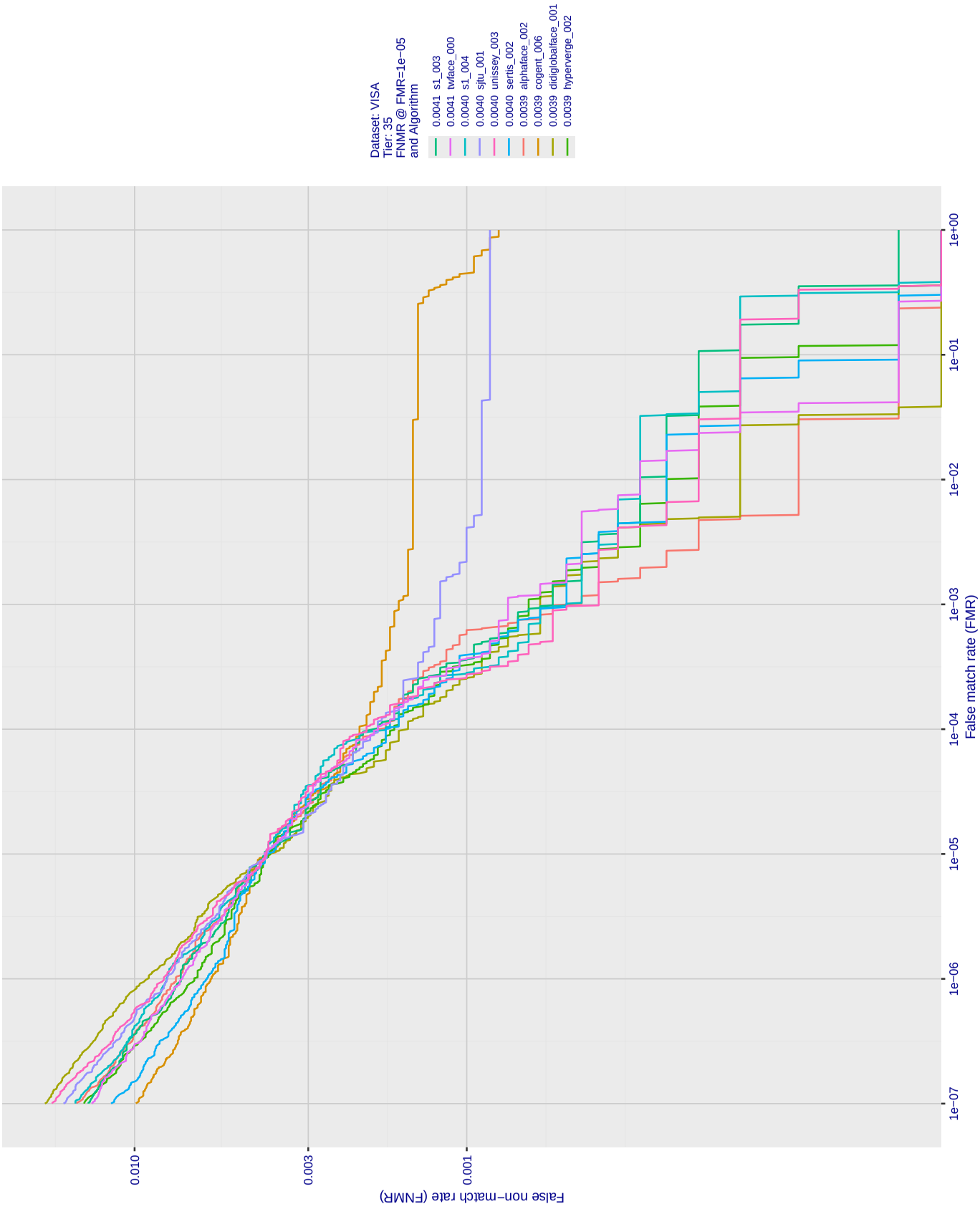

Figure 139: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

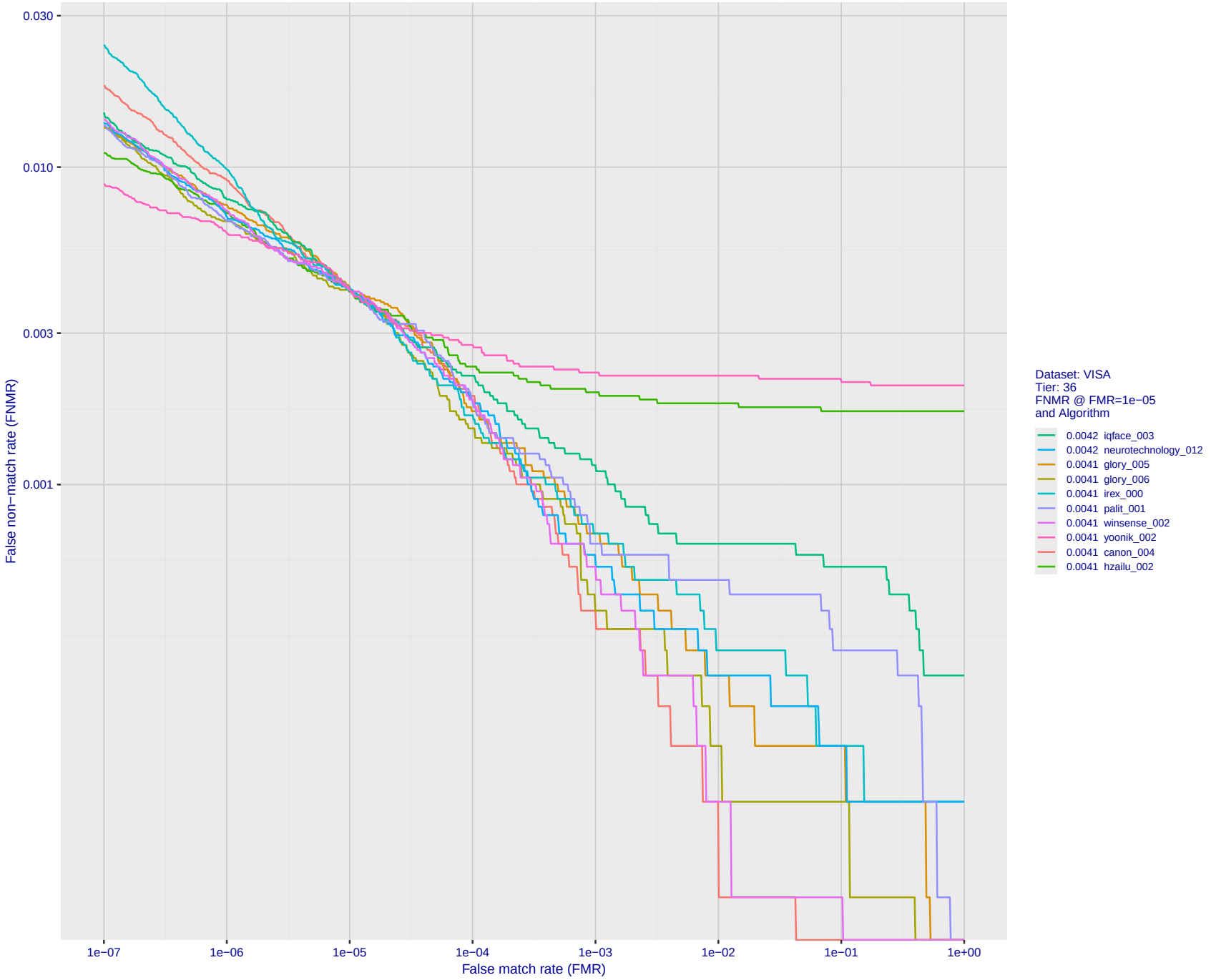

Figure 140: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

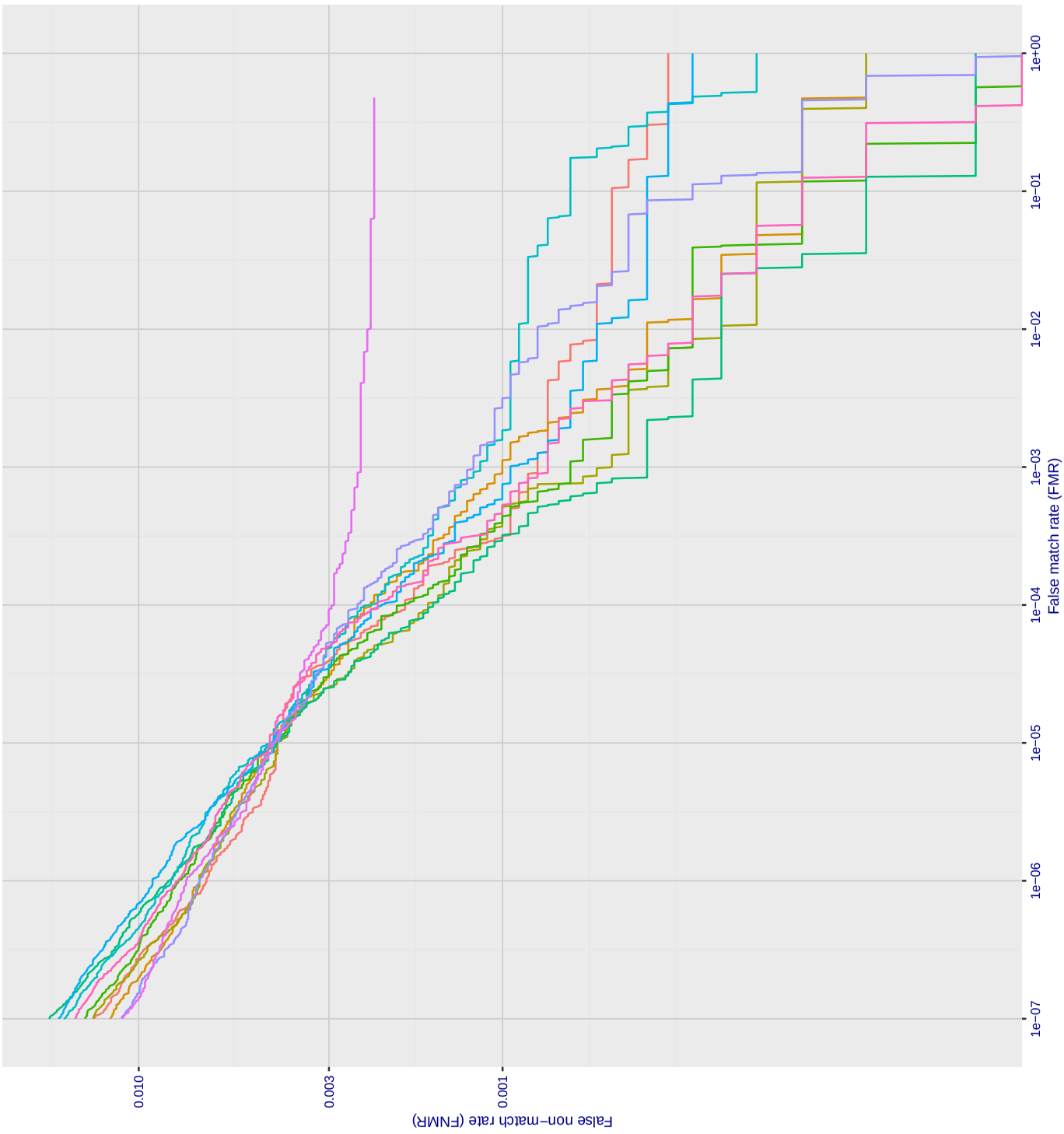

Figure 141: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

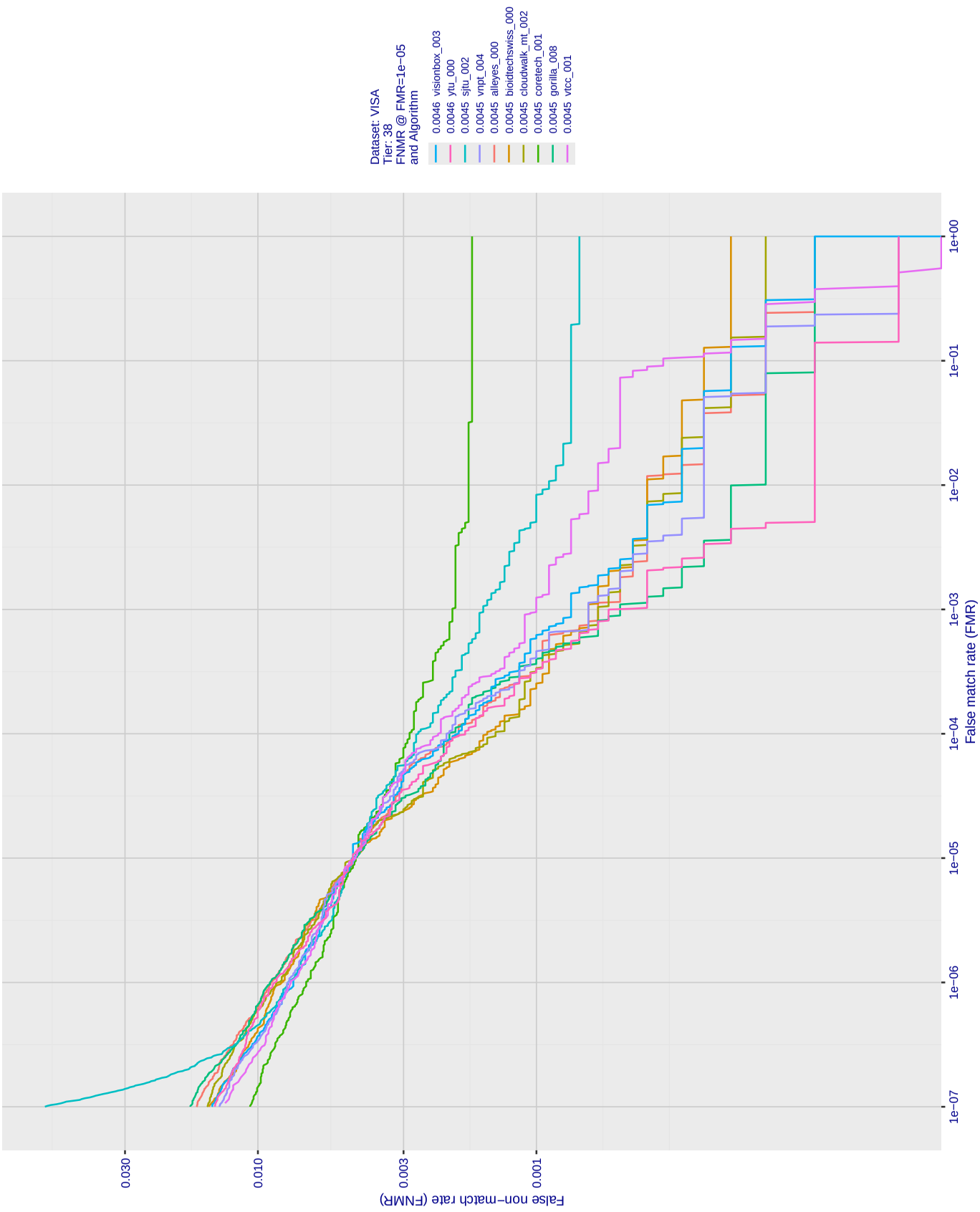

Figure 142: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

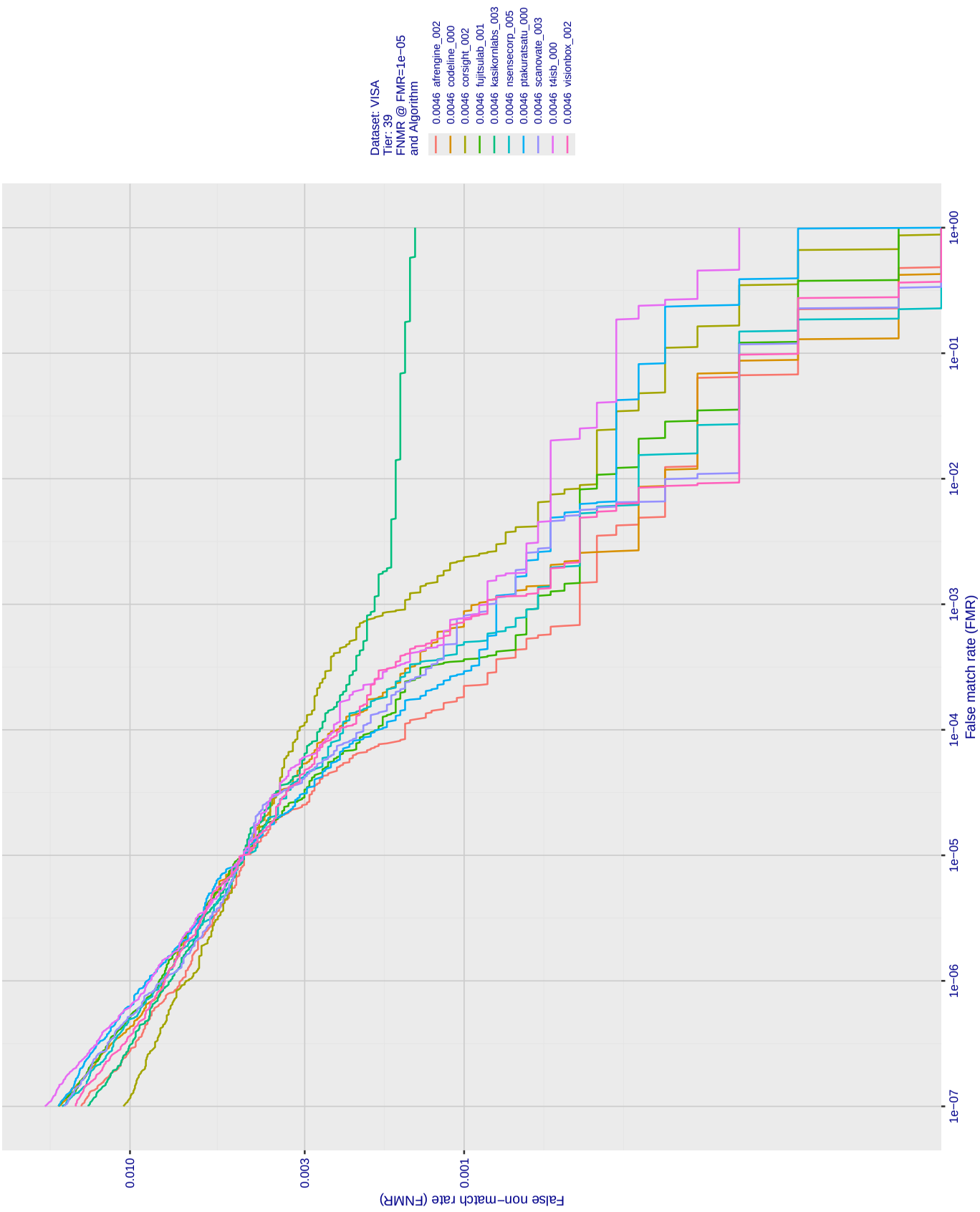

Figure 143: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

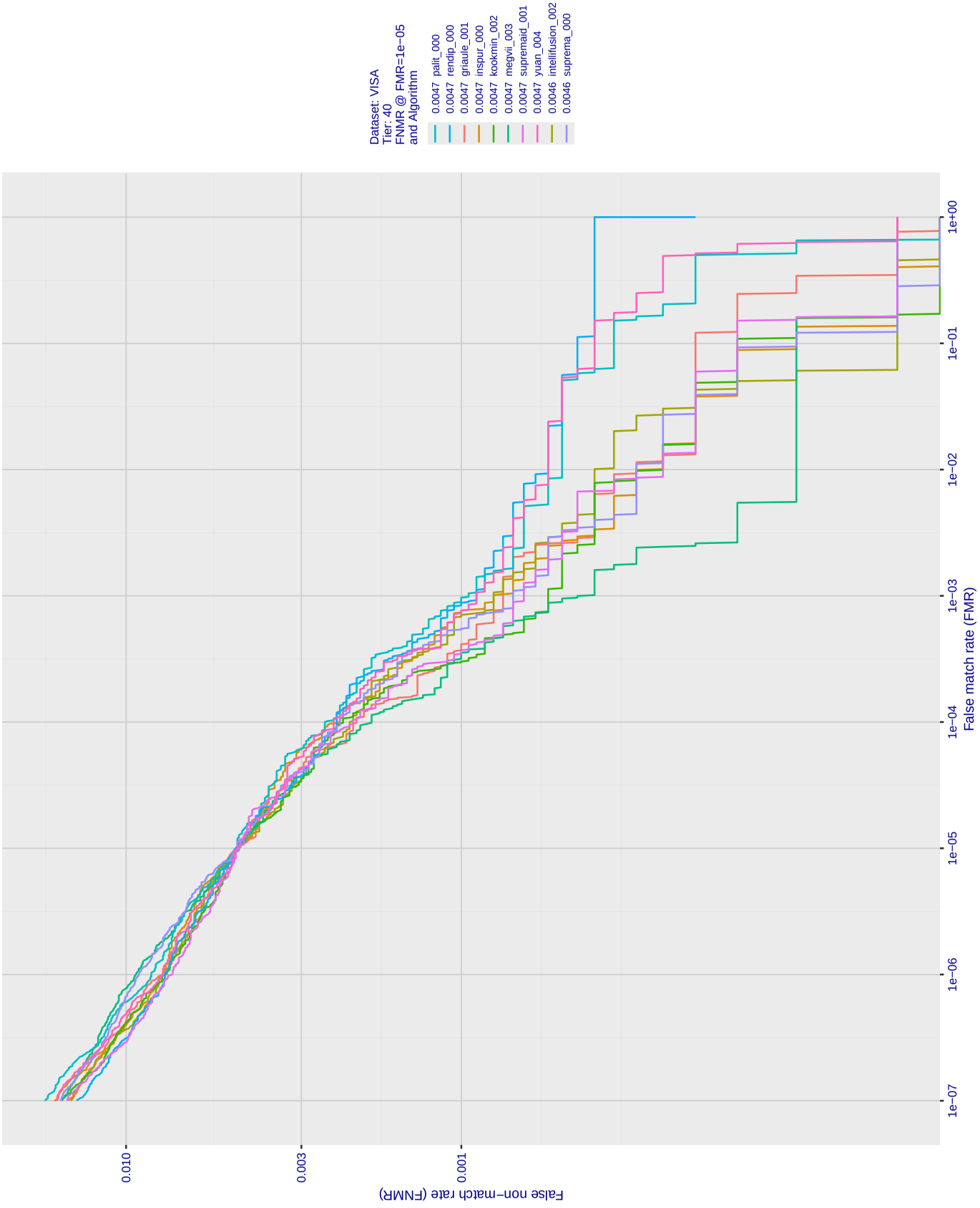

Figure 144: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

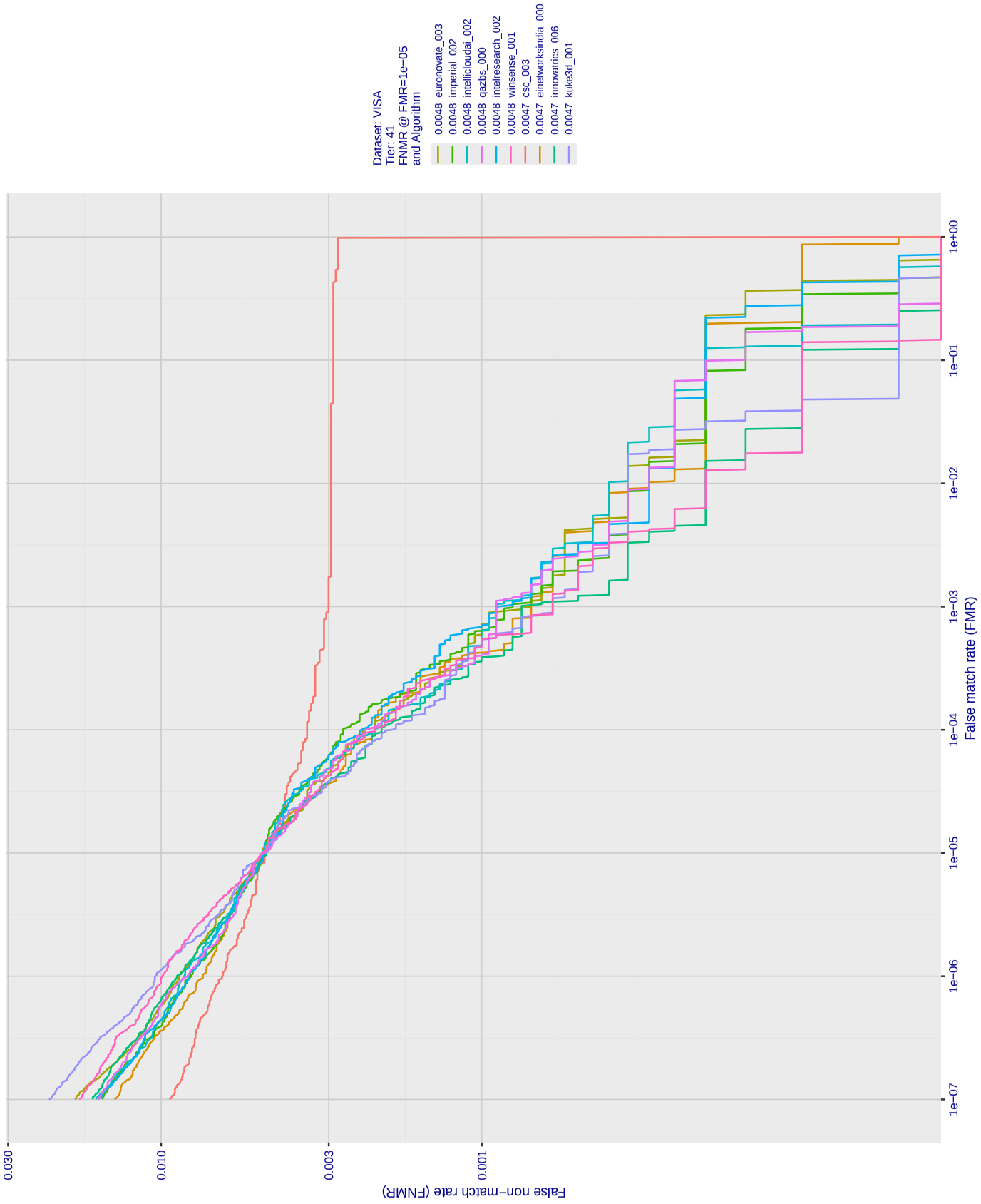

Figure 145: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

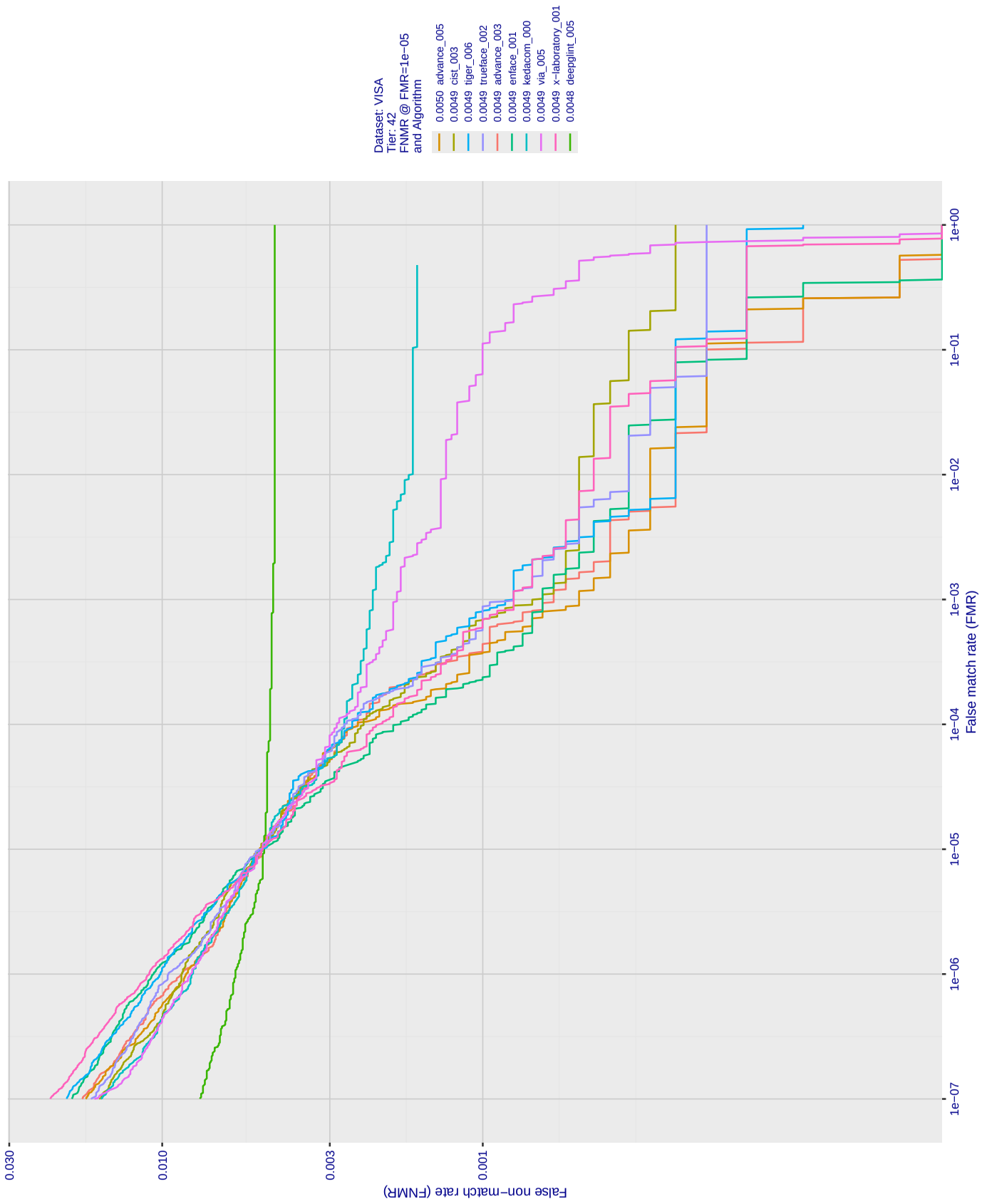

Figure 146: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

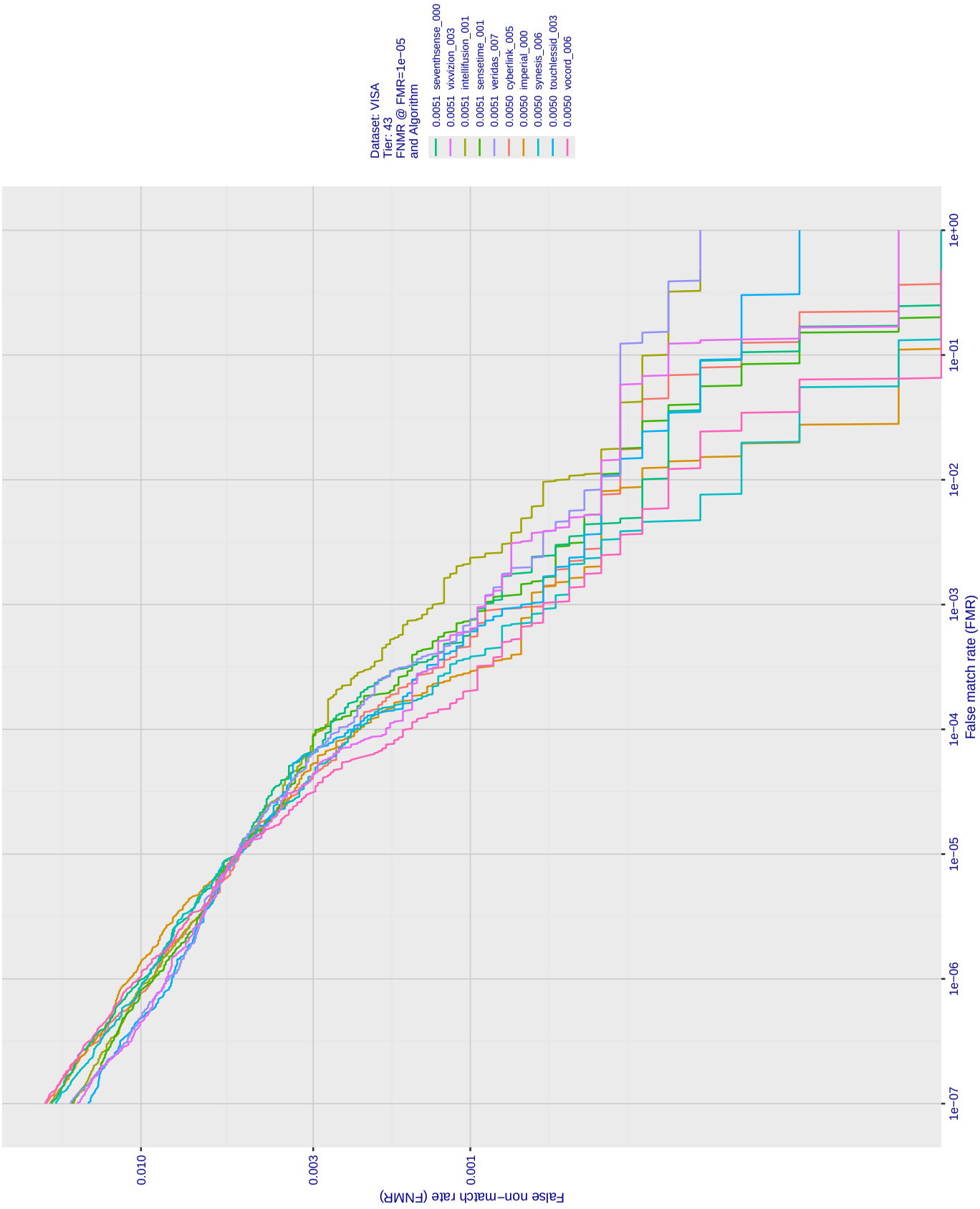

Figure 147: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

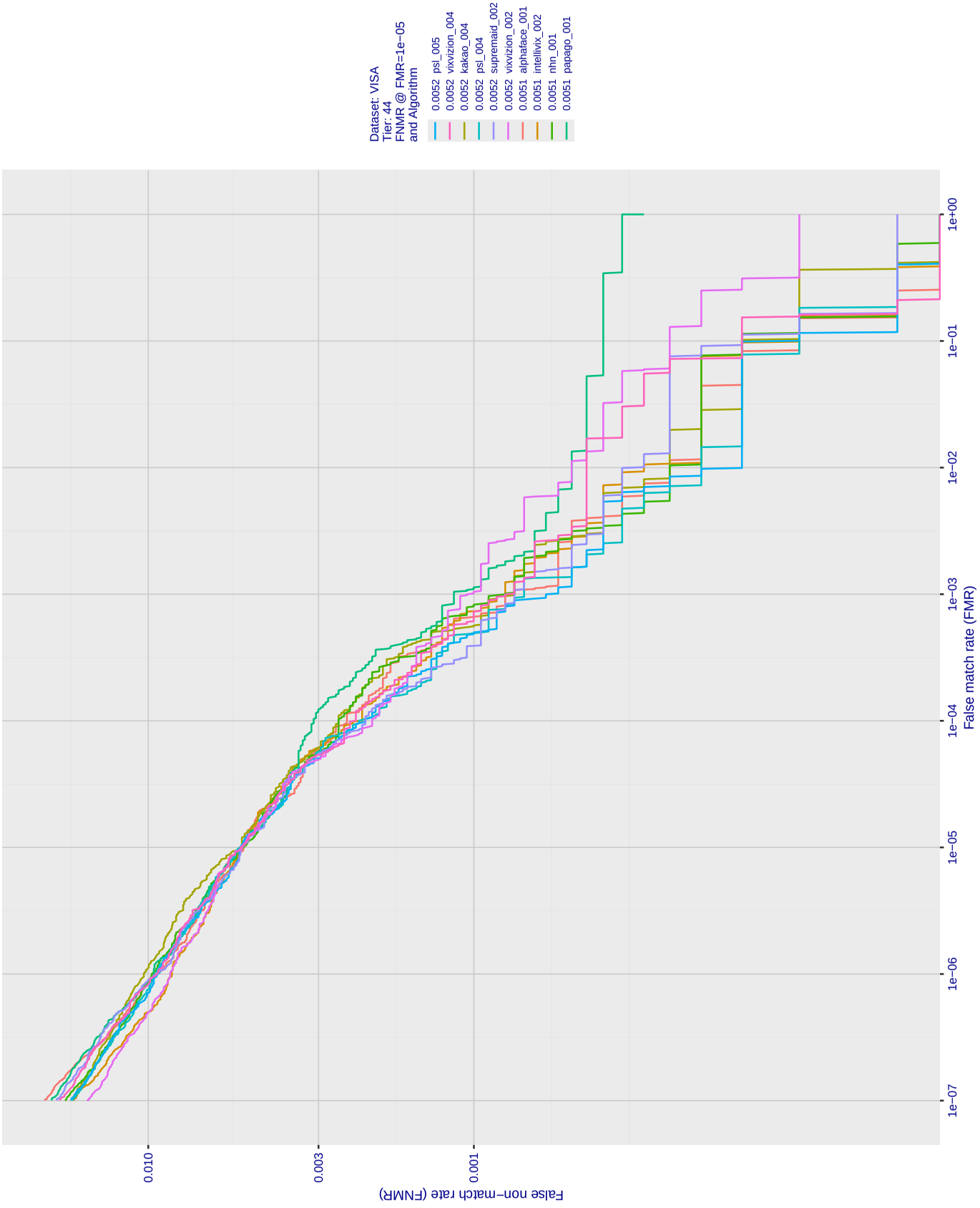

Figure 148: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

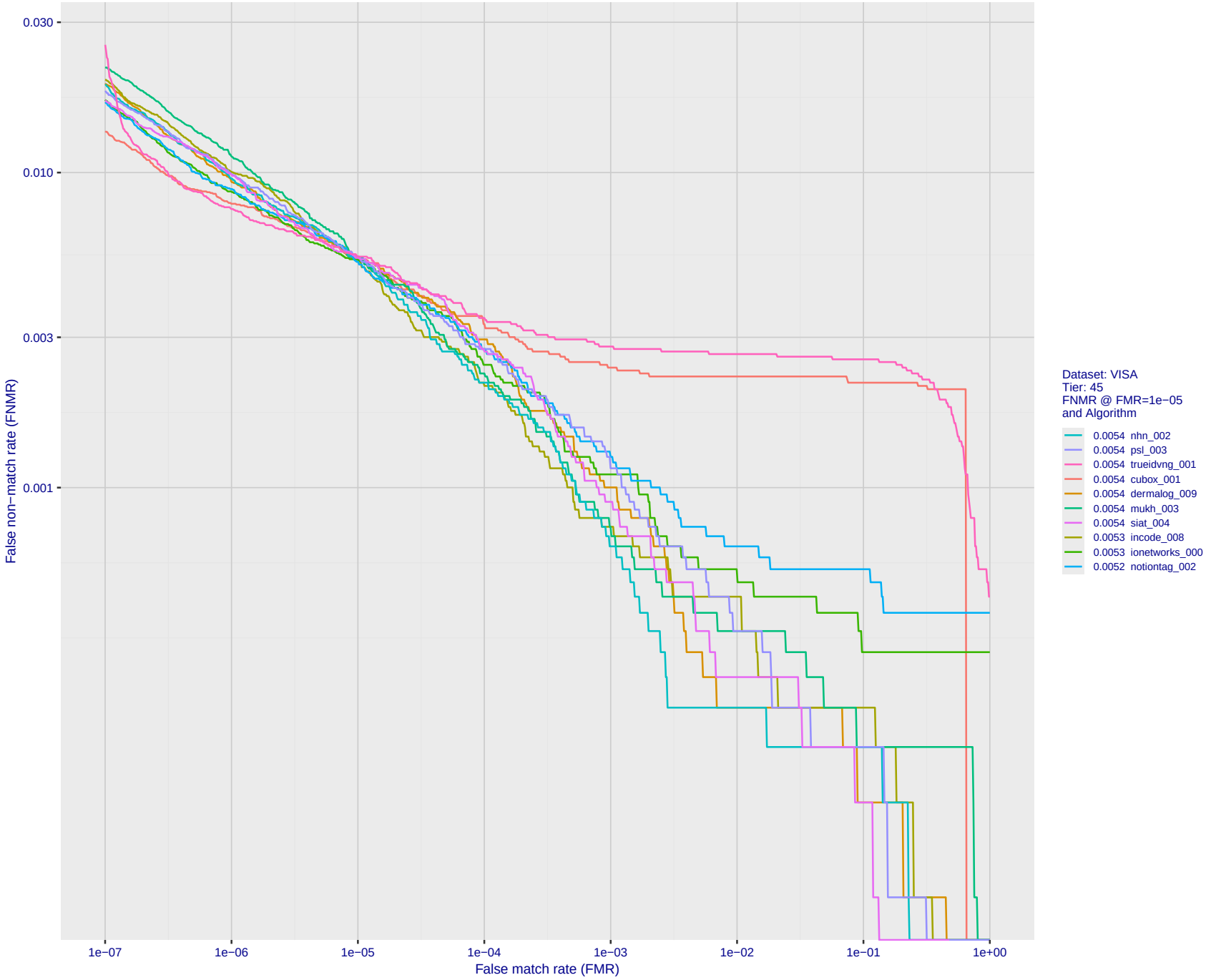

Figure 149: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

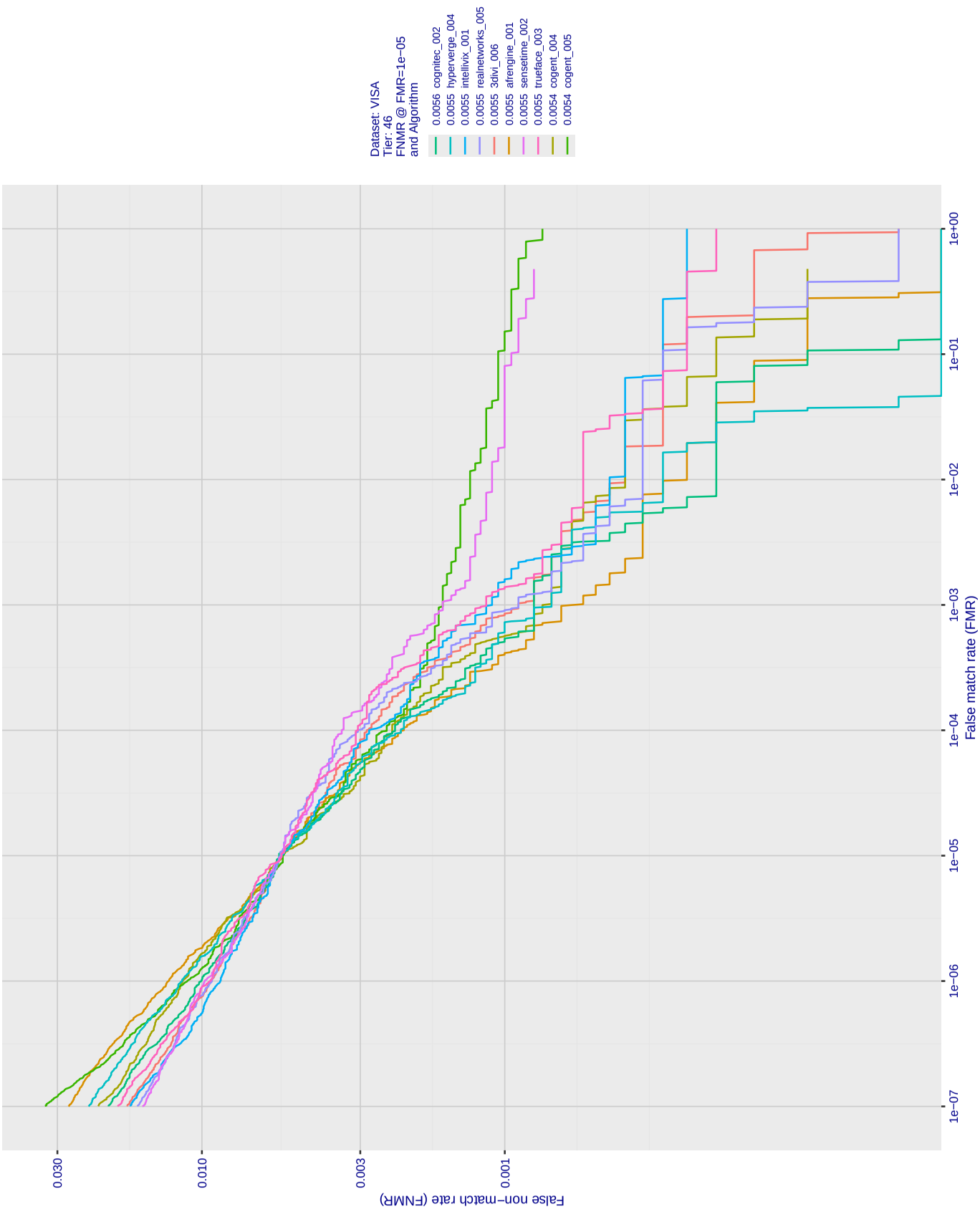

Figure 150: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

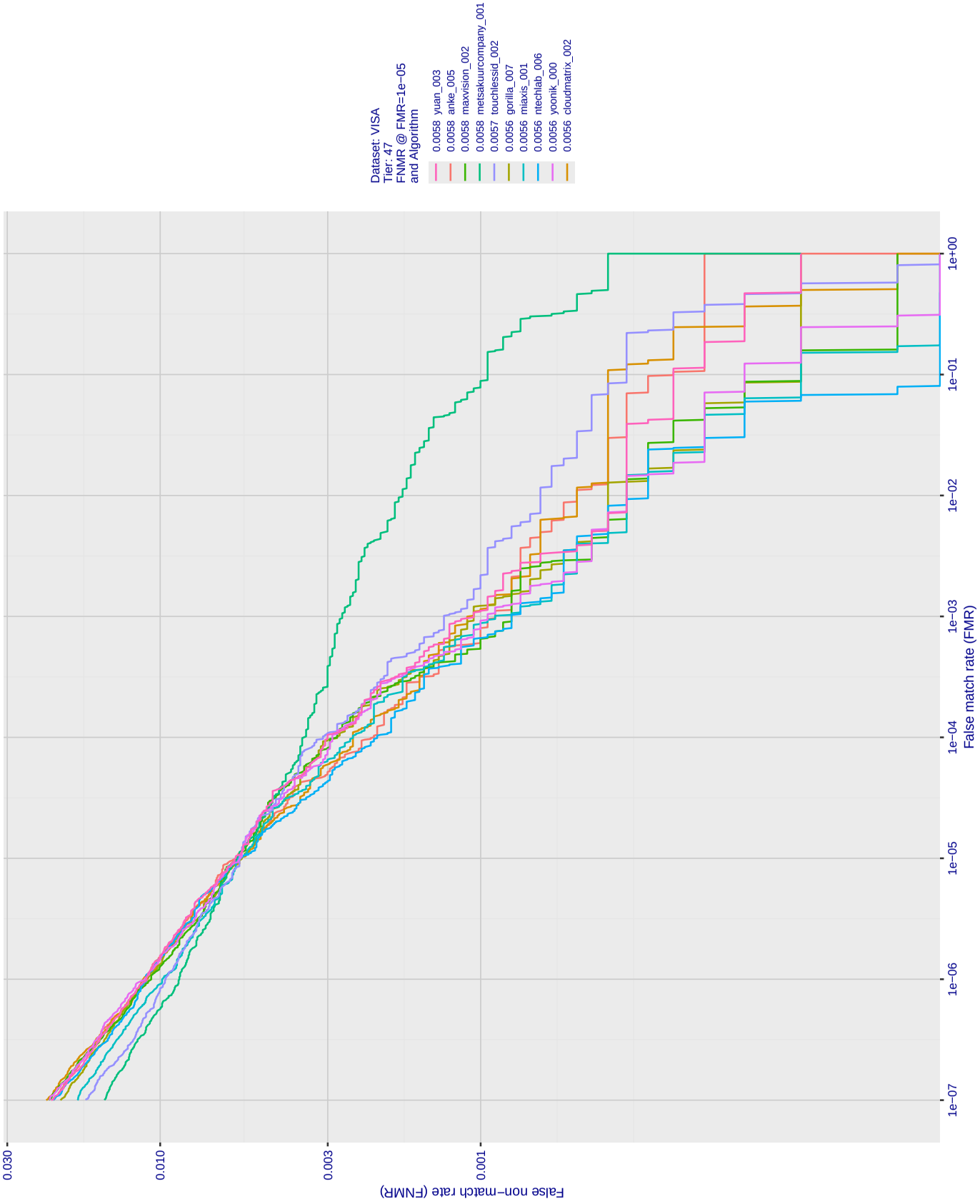

Figure 151: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

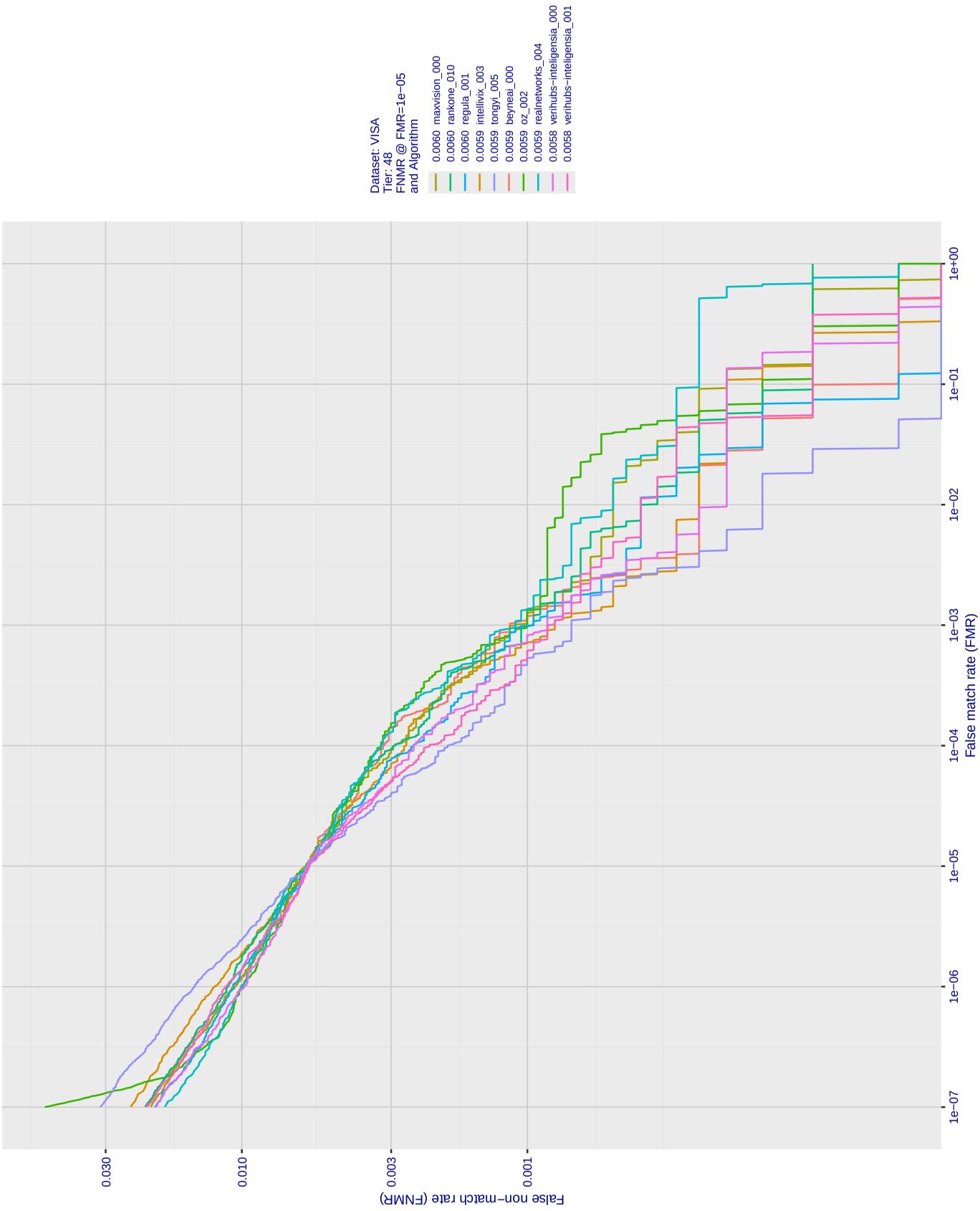

Figure 152: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

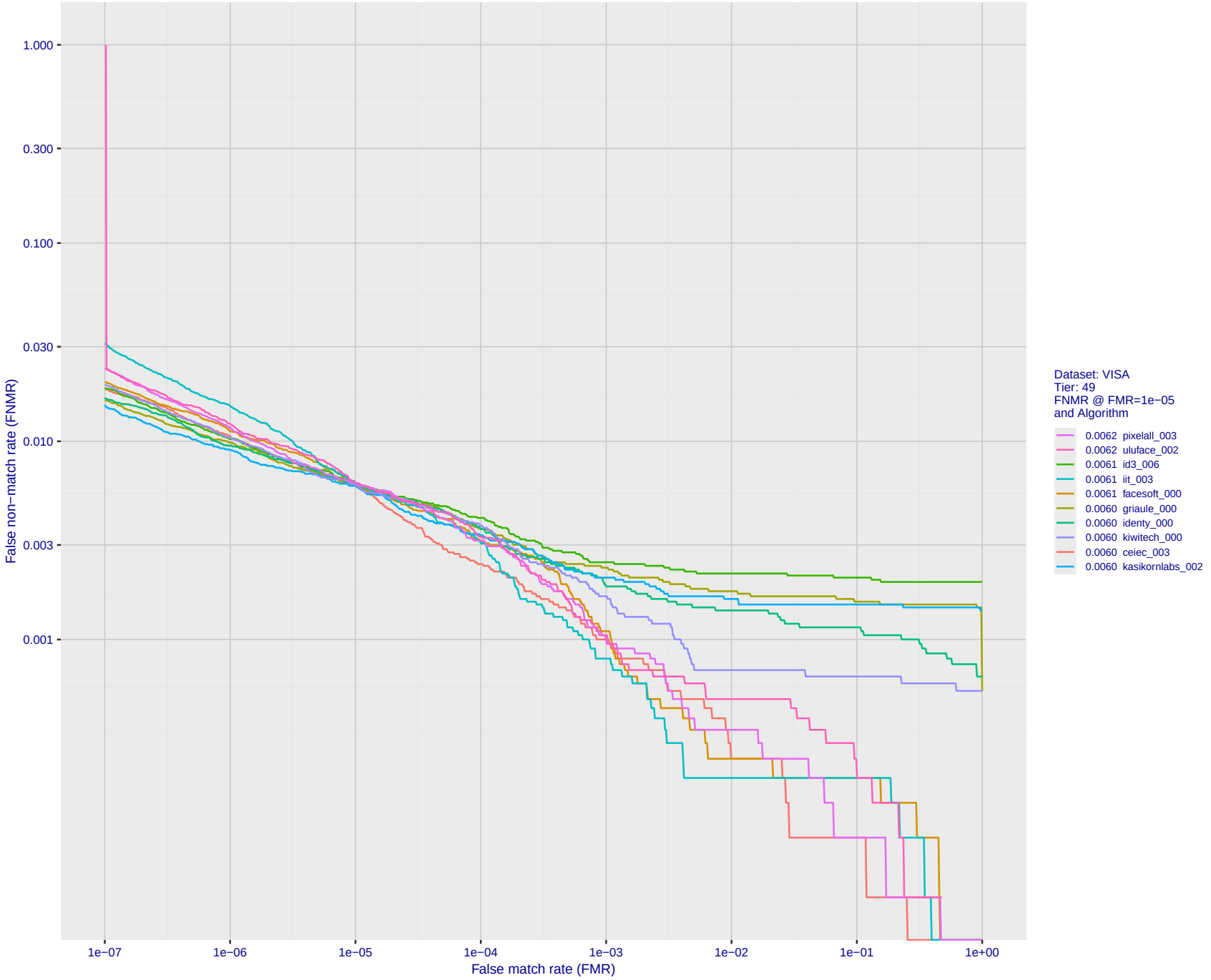

Figure 153: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

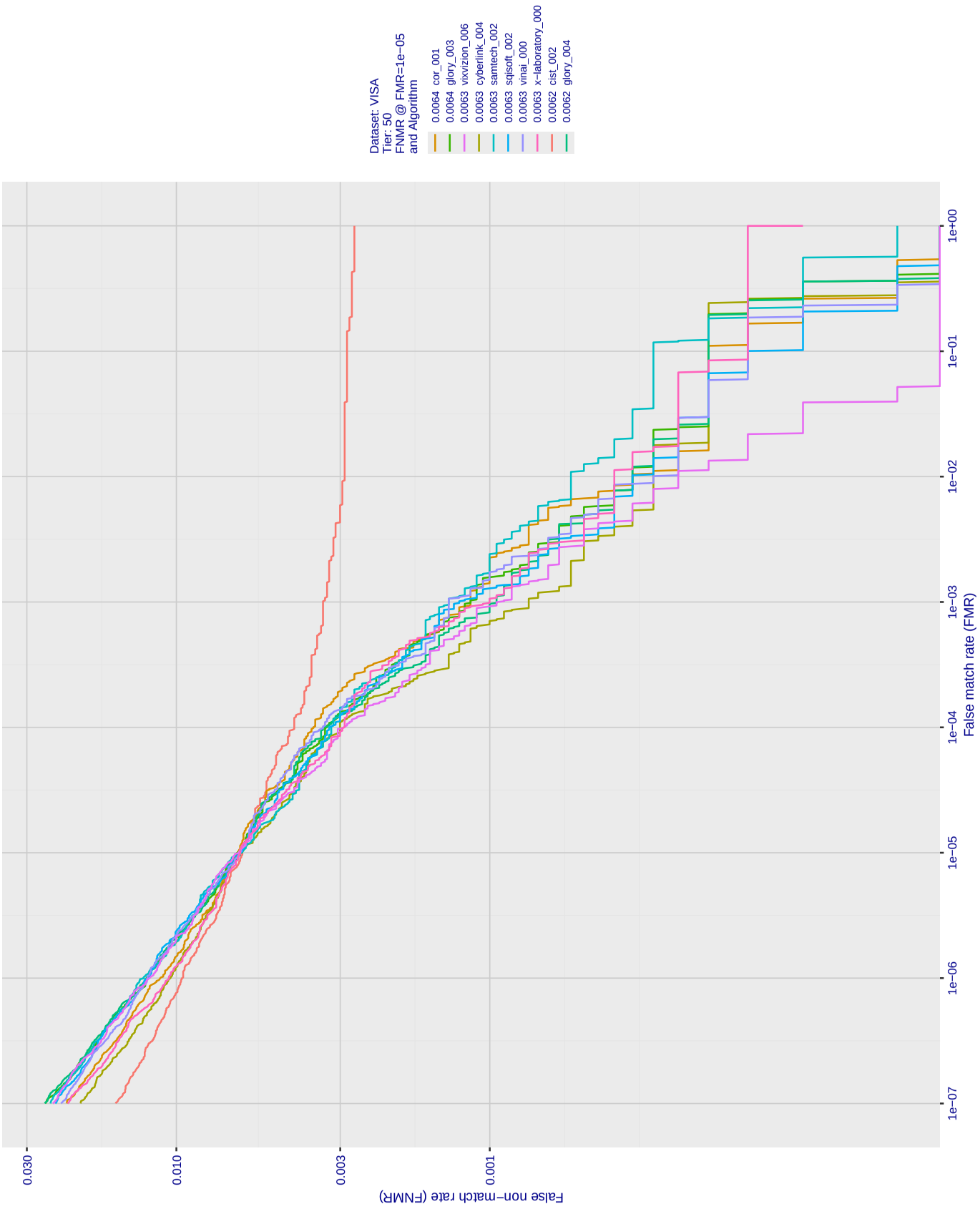

Figure 154: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

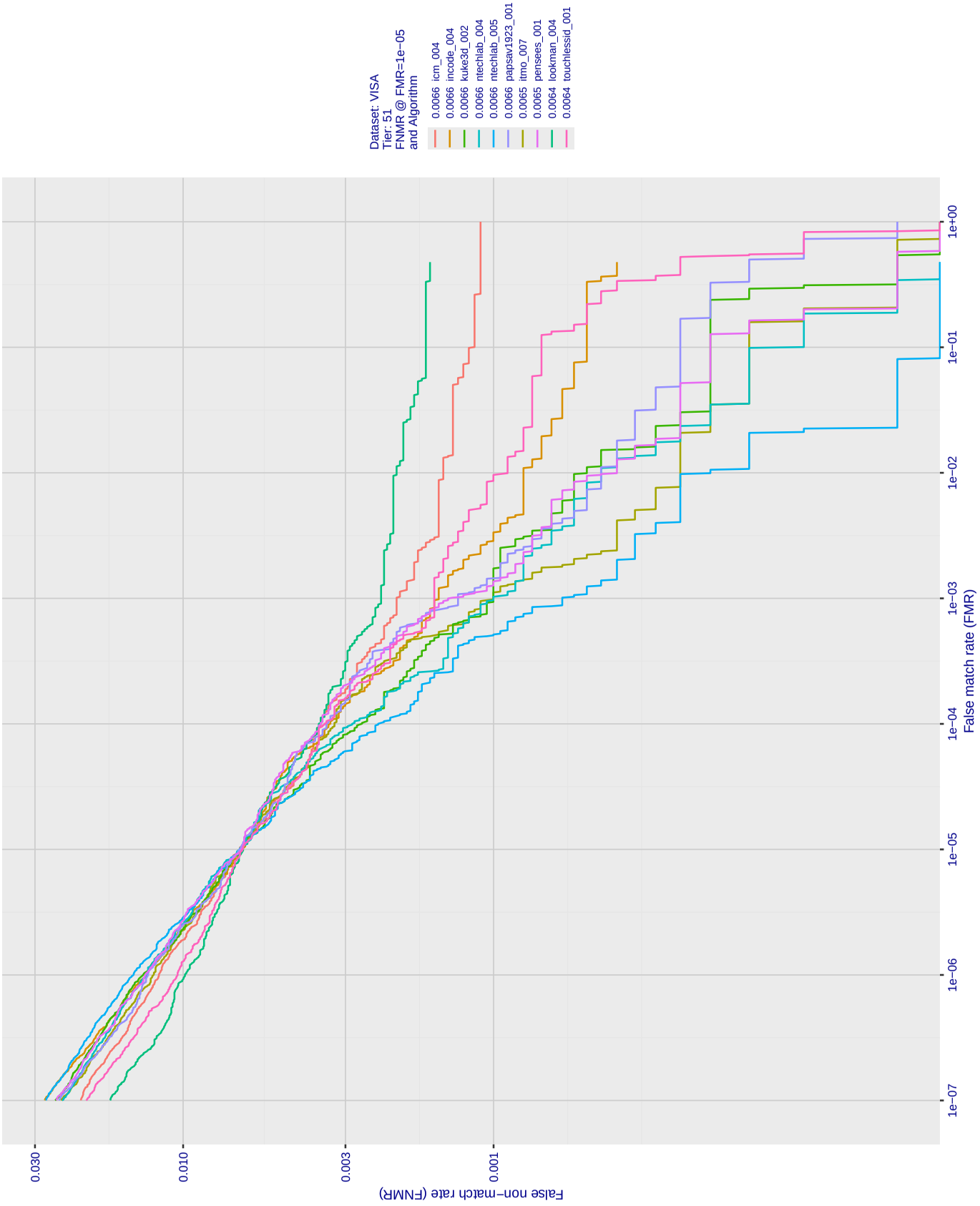

Figure 155: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

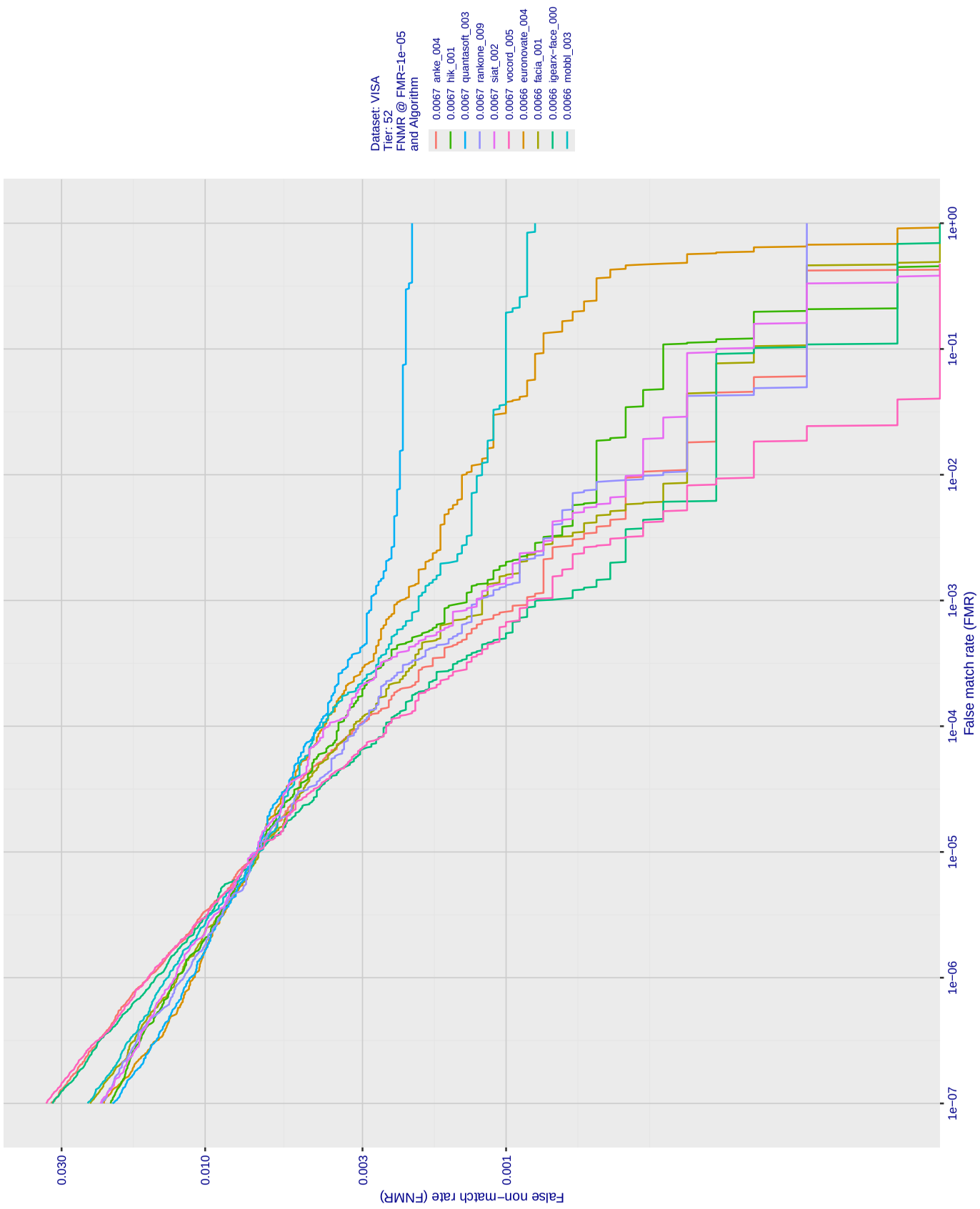

Figure 156: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

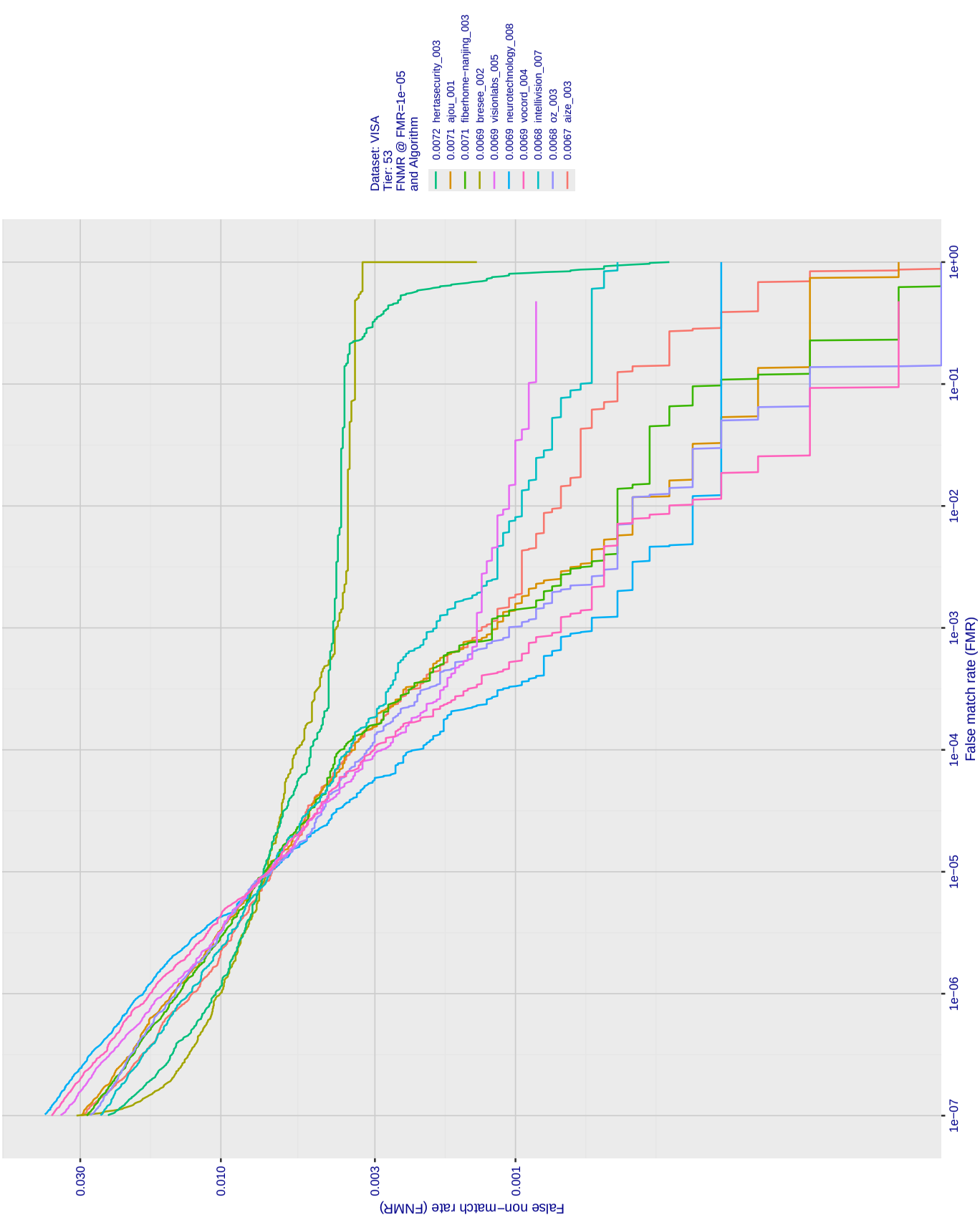

Figure 157: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

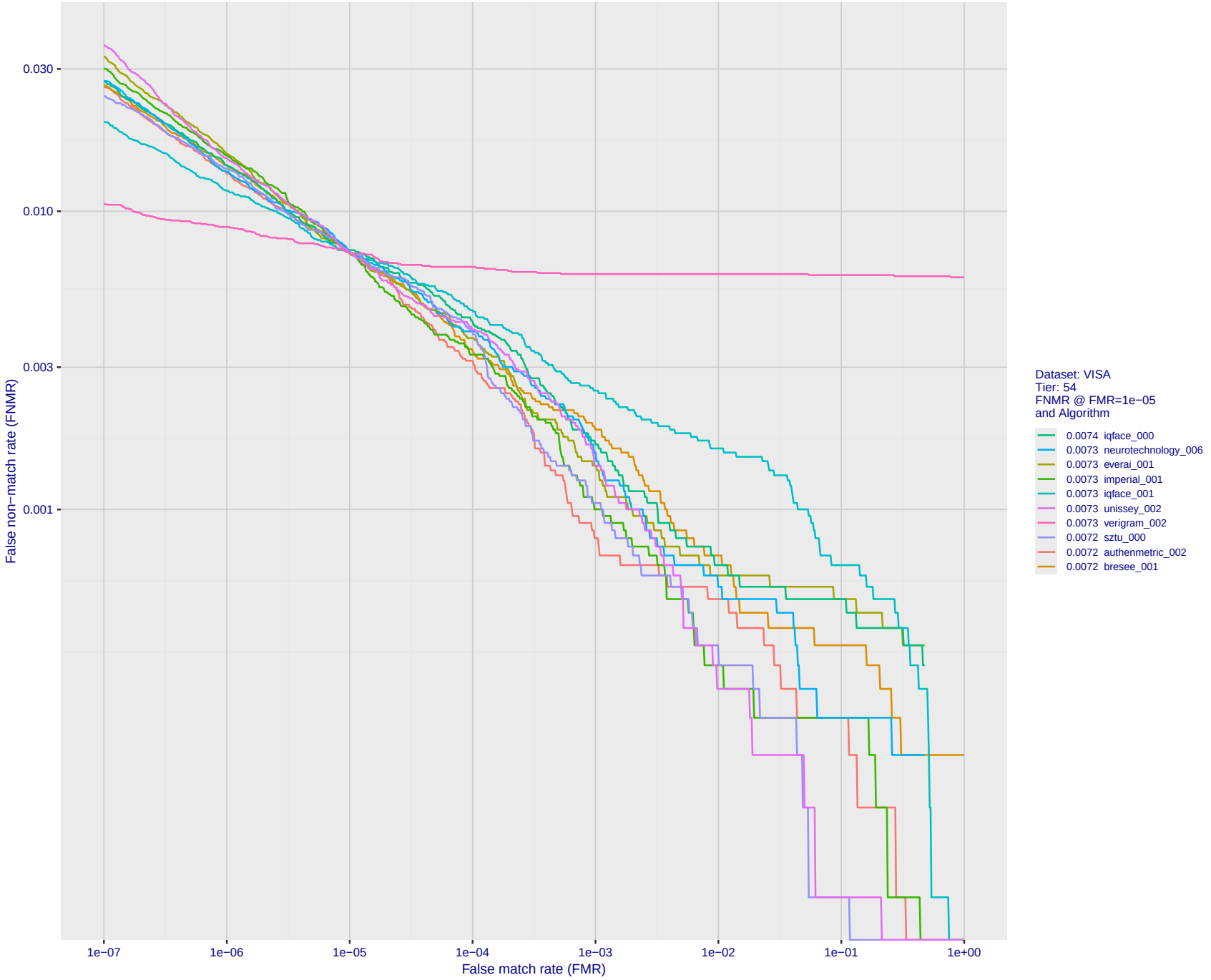

Figure 158: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

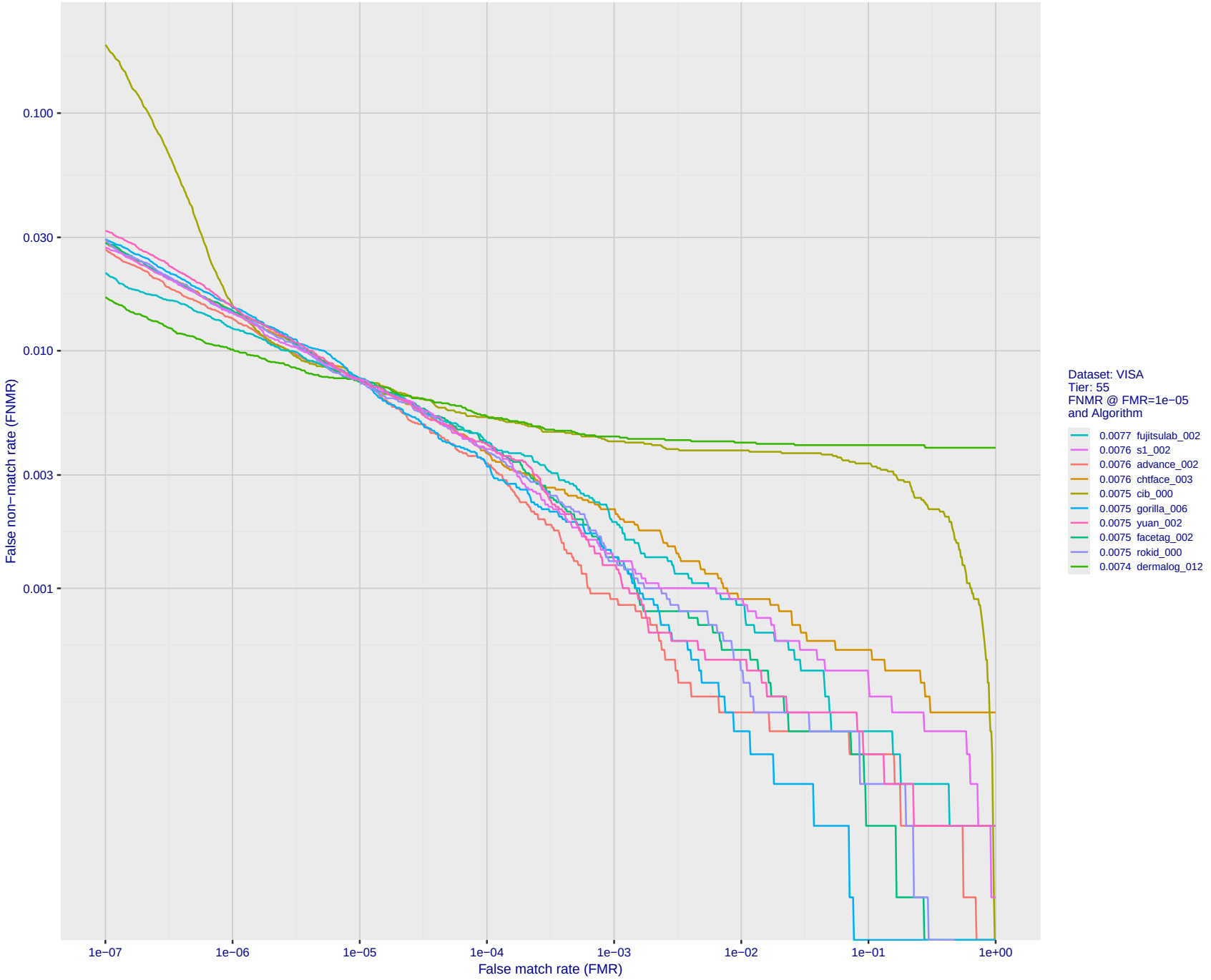

Figure 159: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

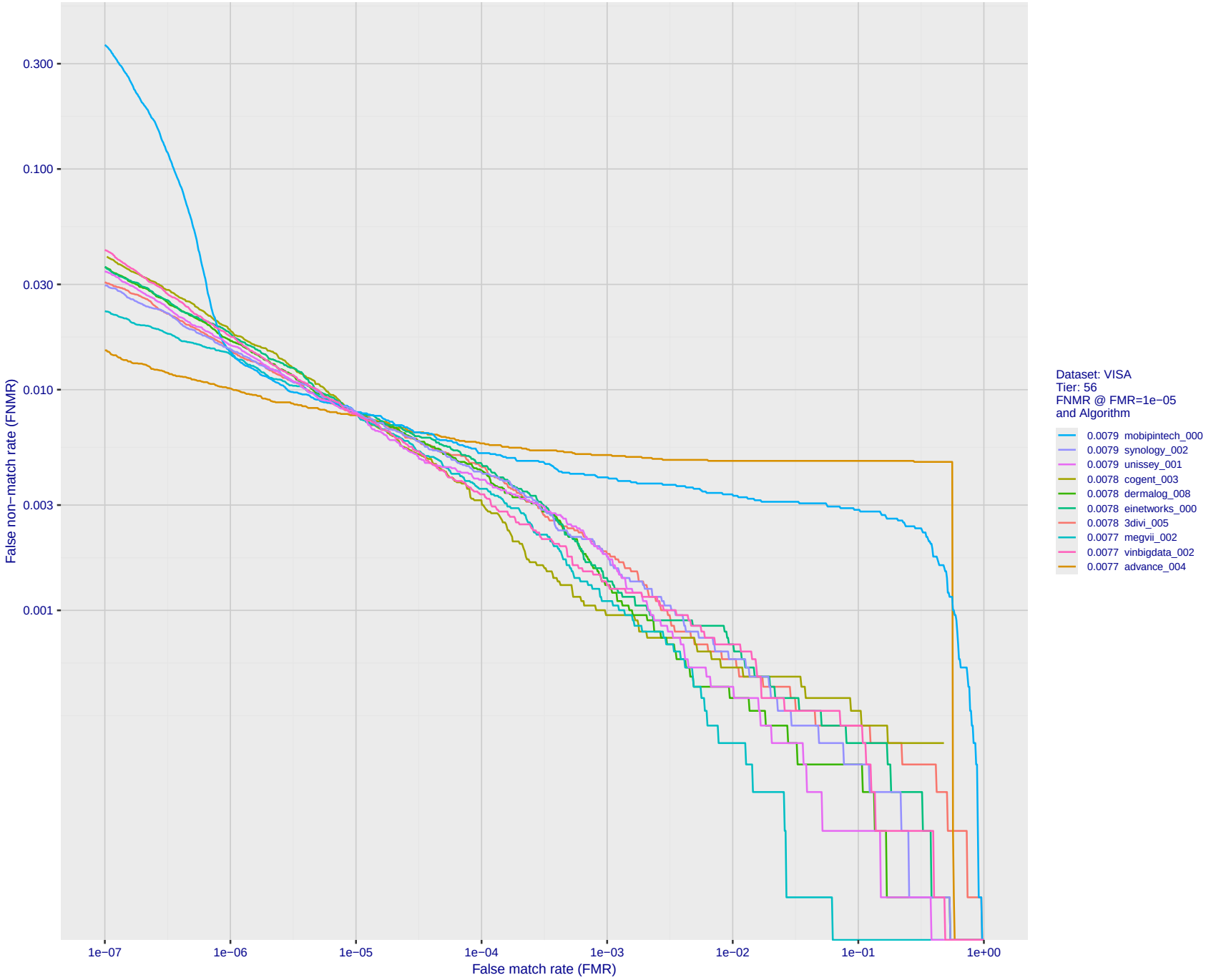

Figure 160: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

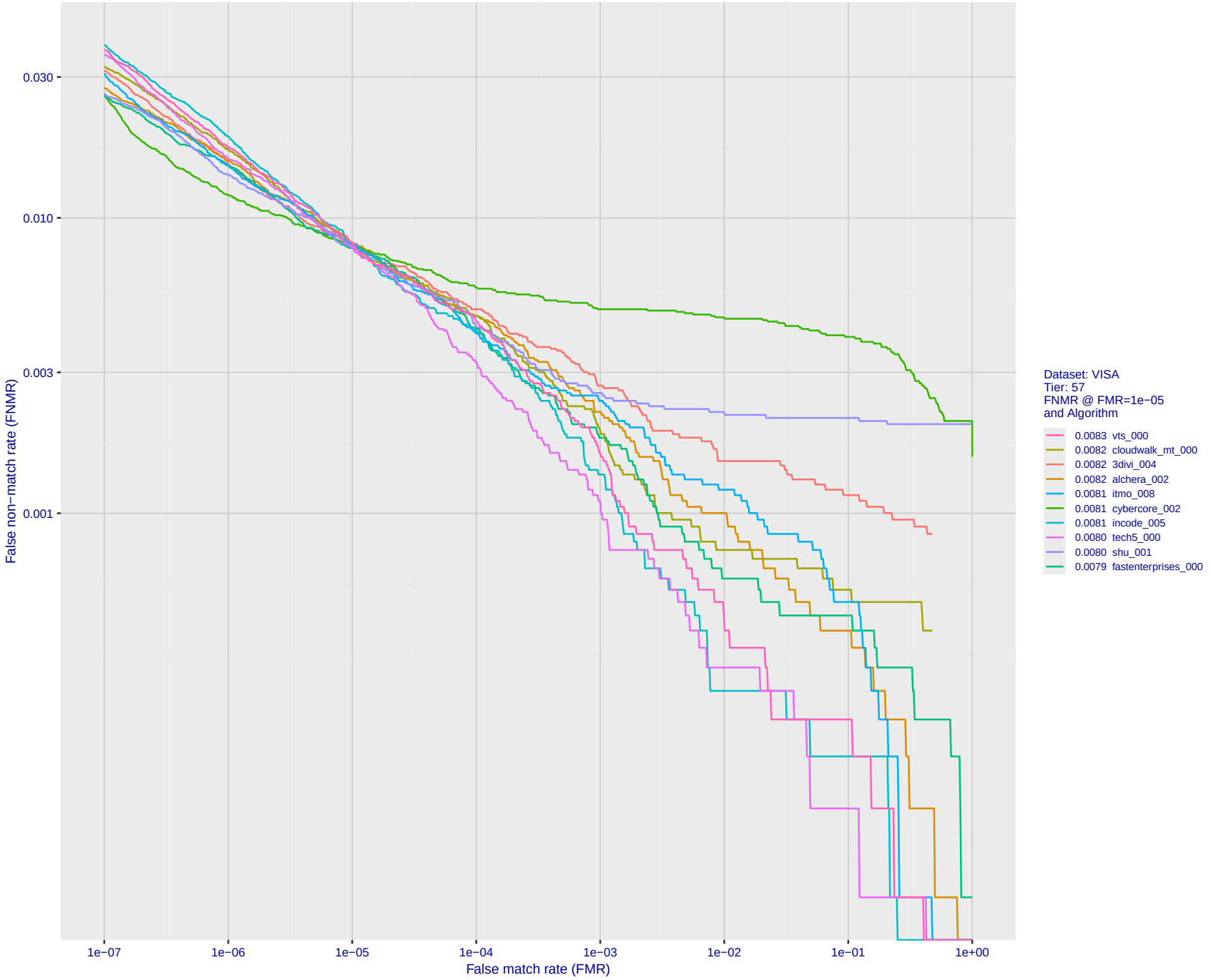

Figure 161: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

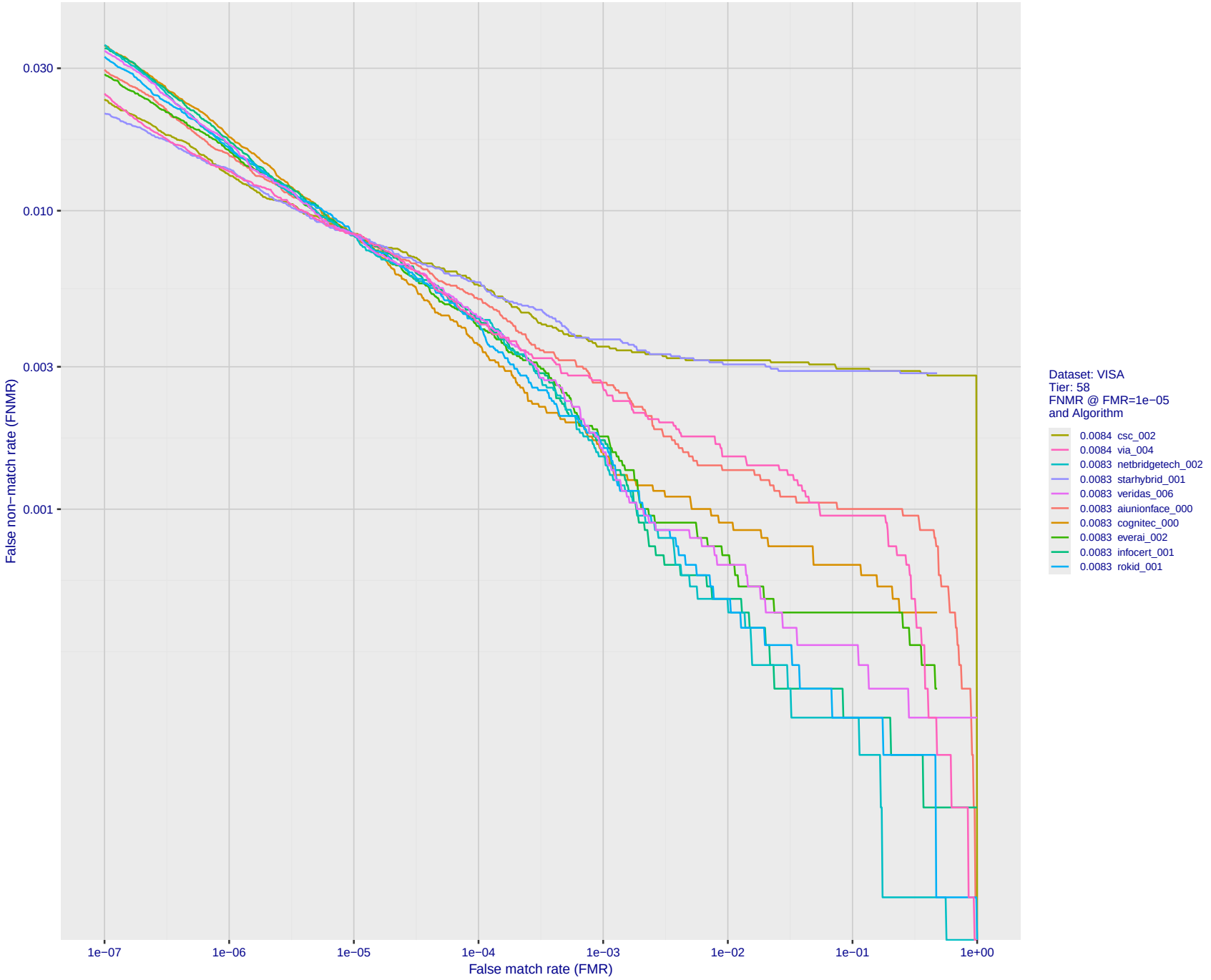

Figure 162: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

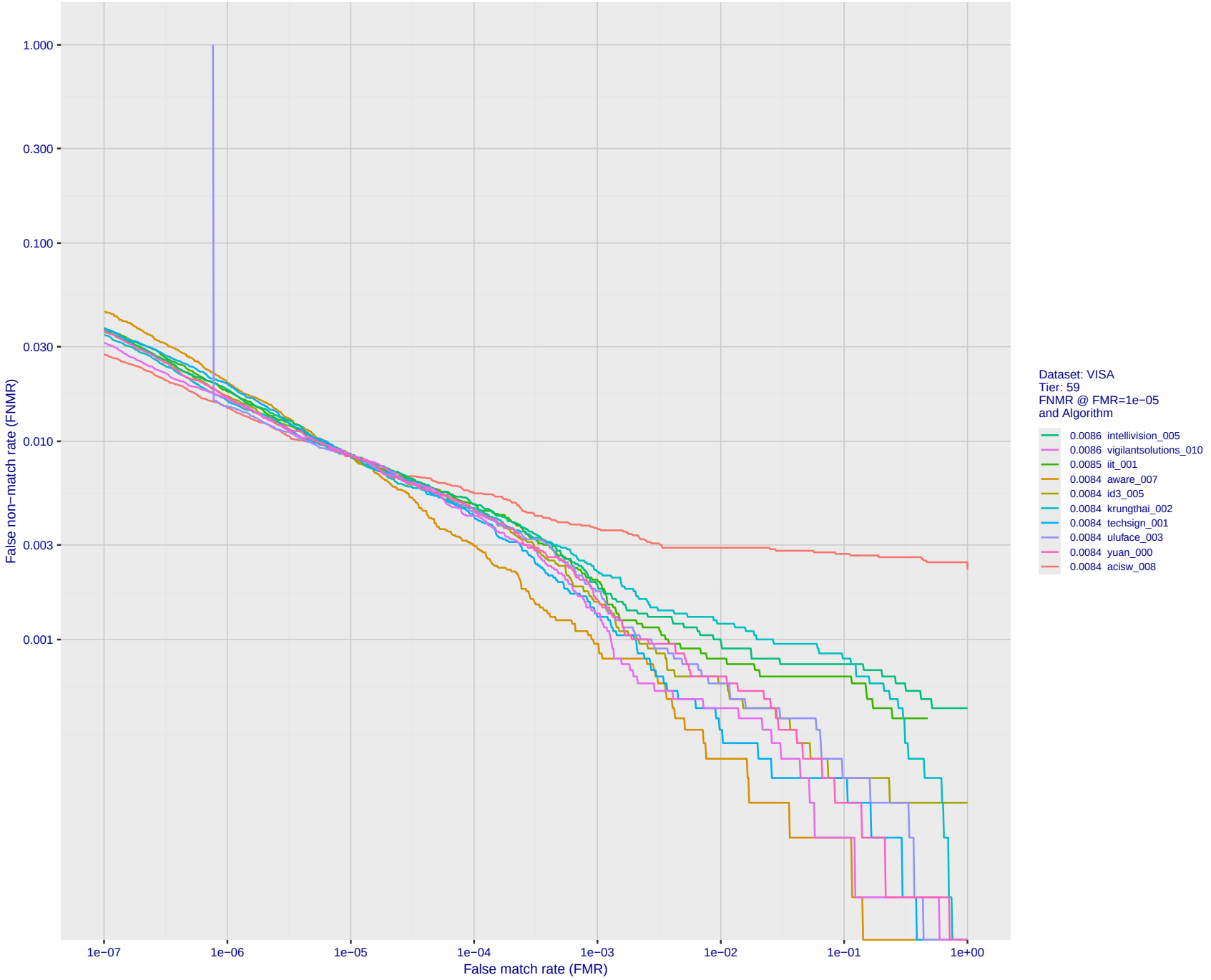

Figure 163: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

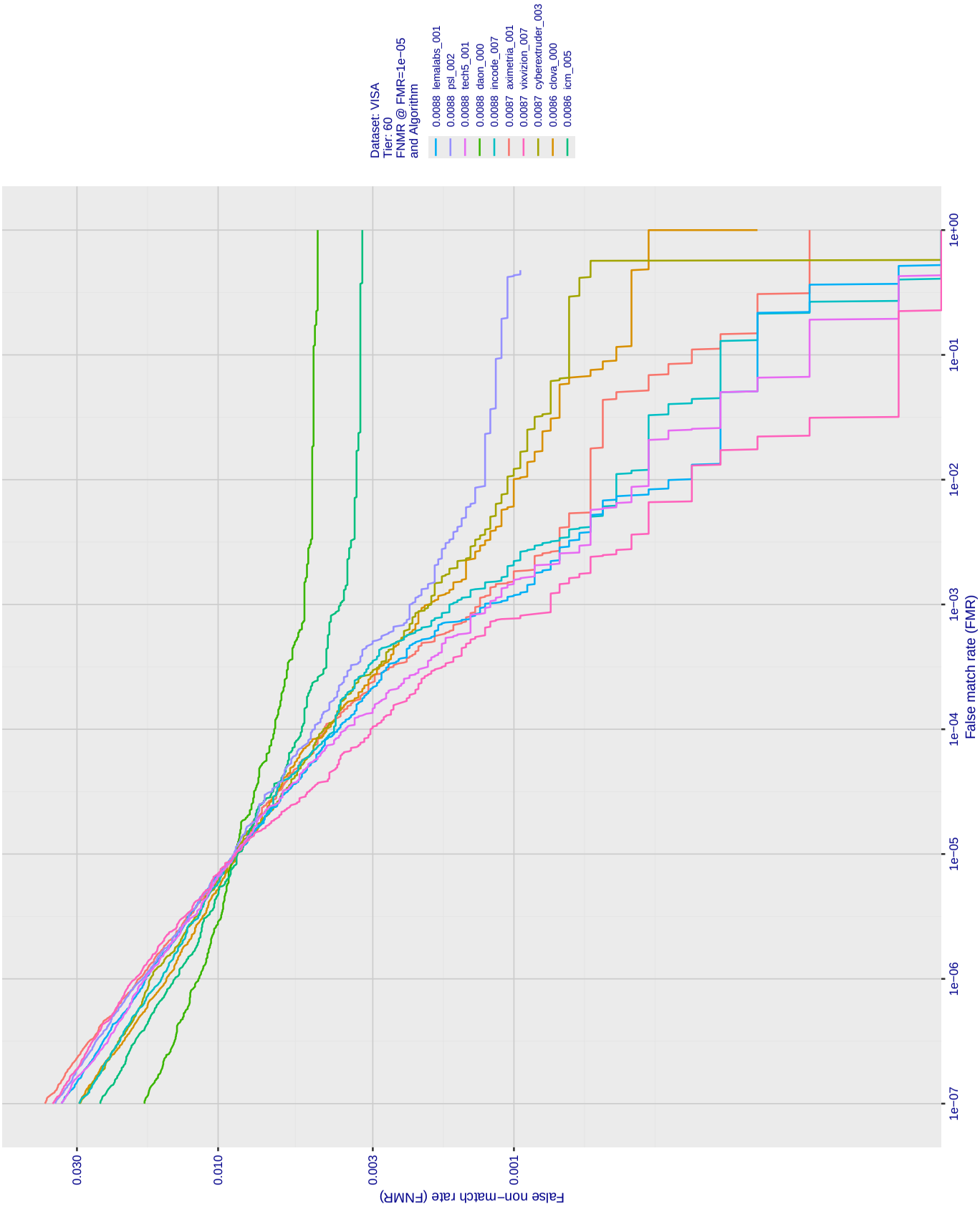

Figure 164: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

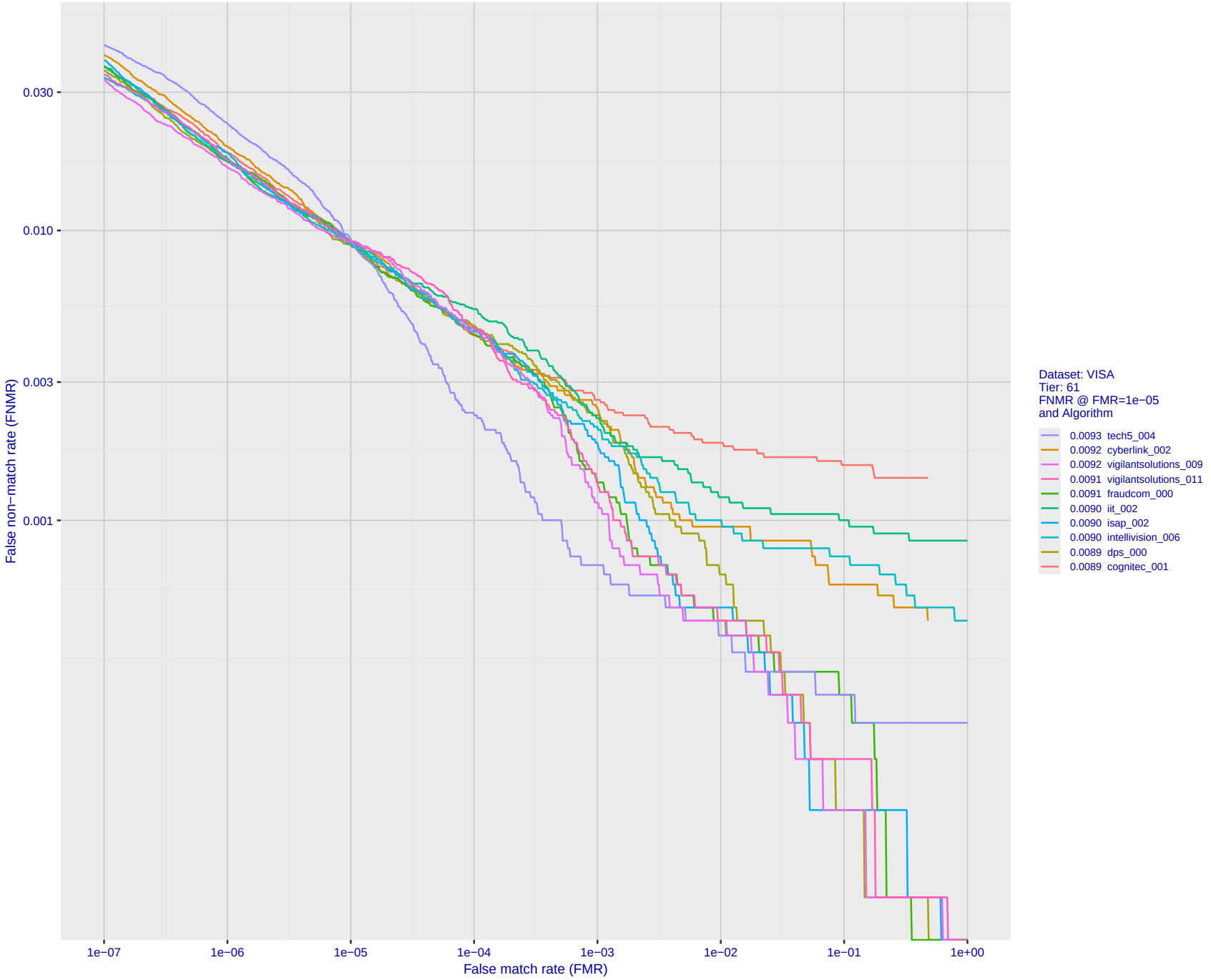

Figure 165: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

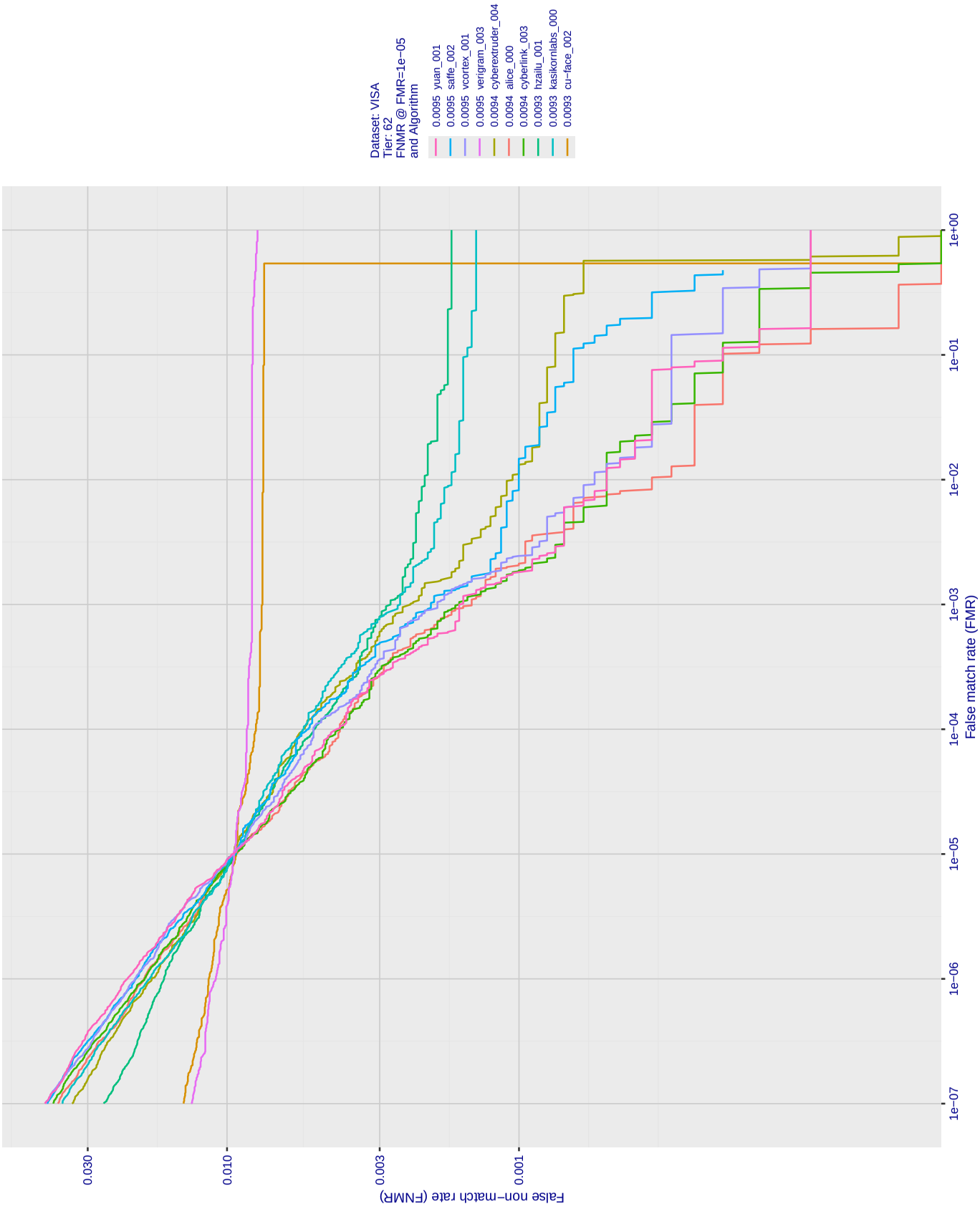

Figure 166: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

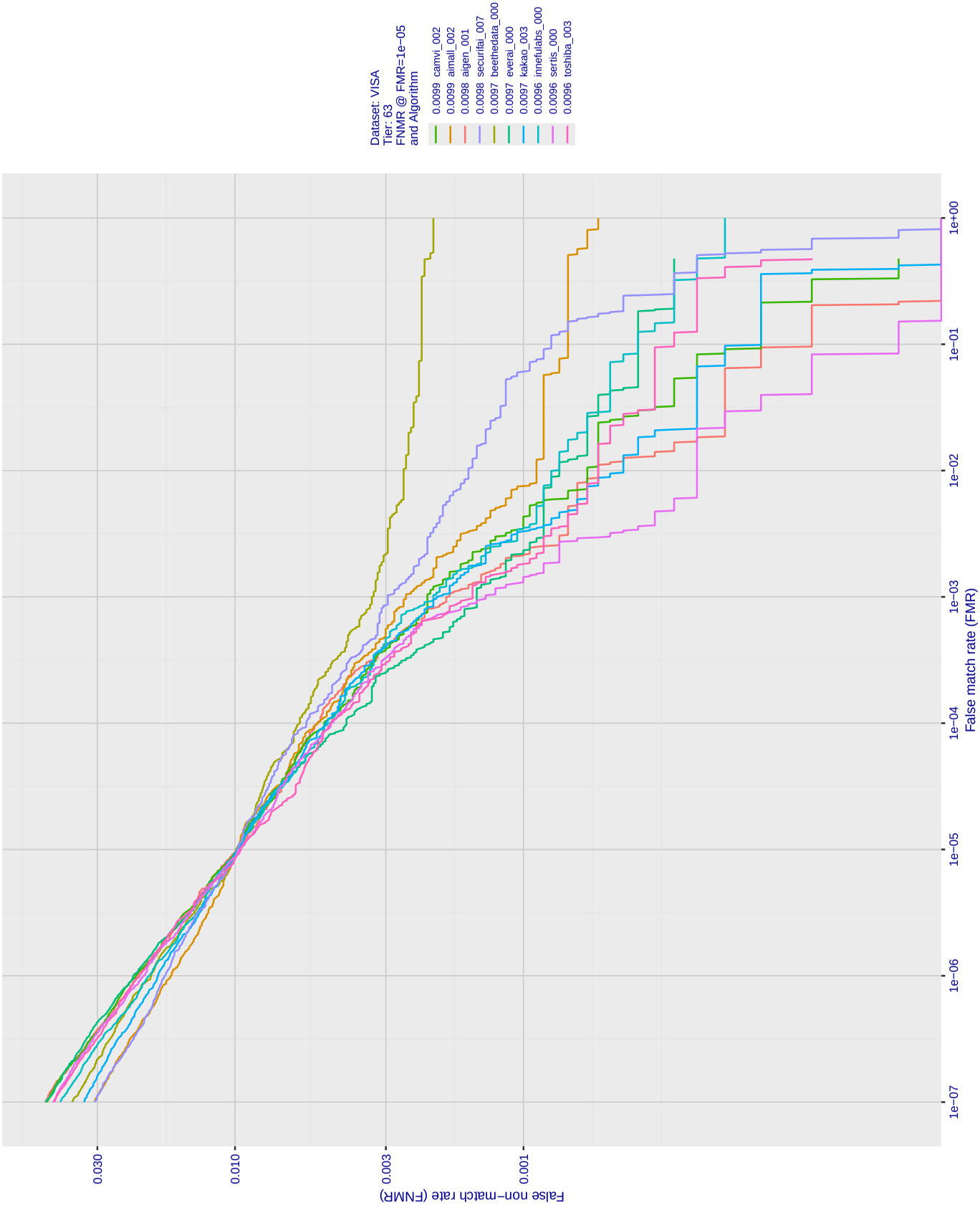

Figure 167: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

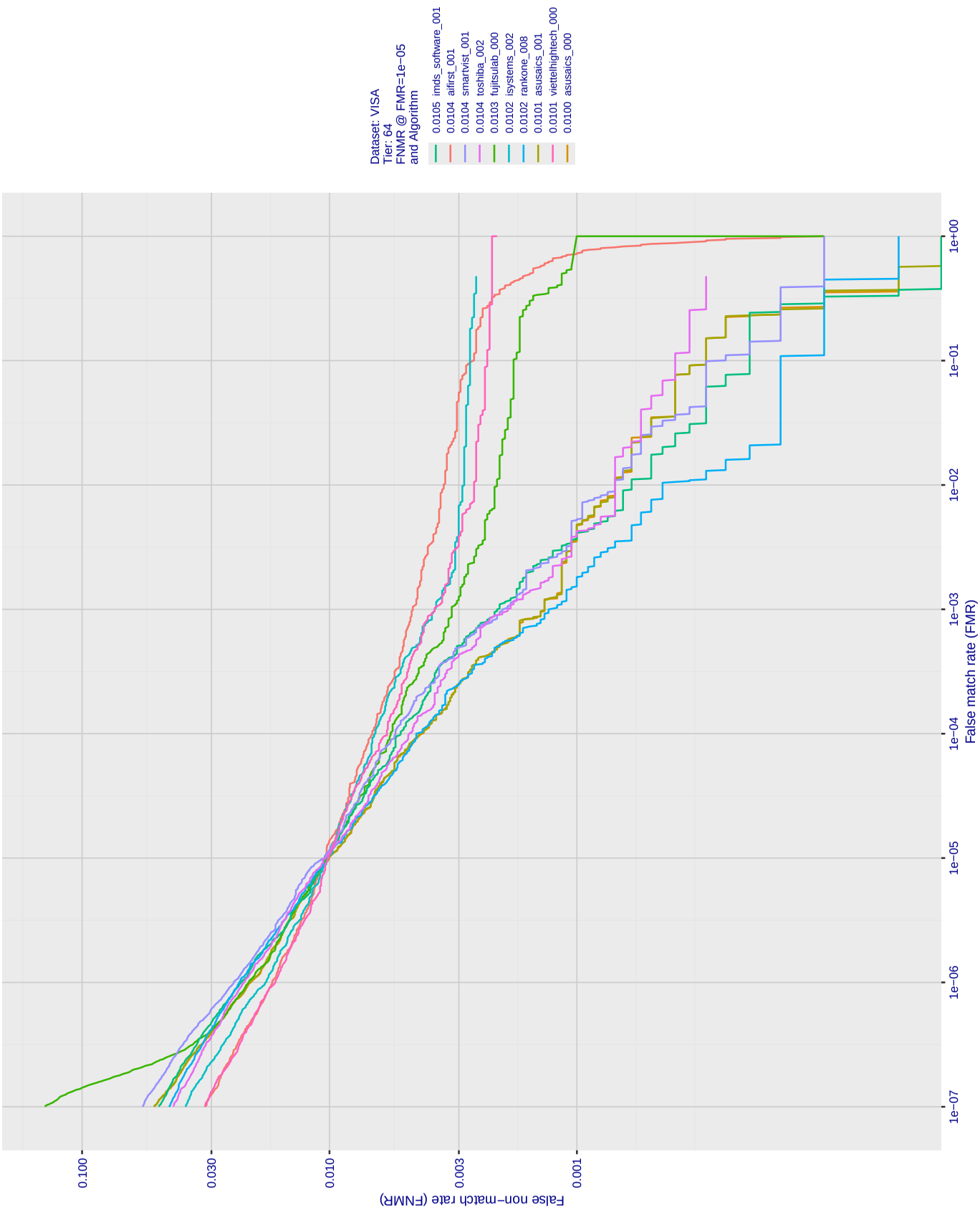

Figure 168: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

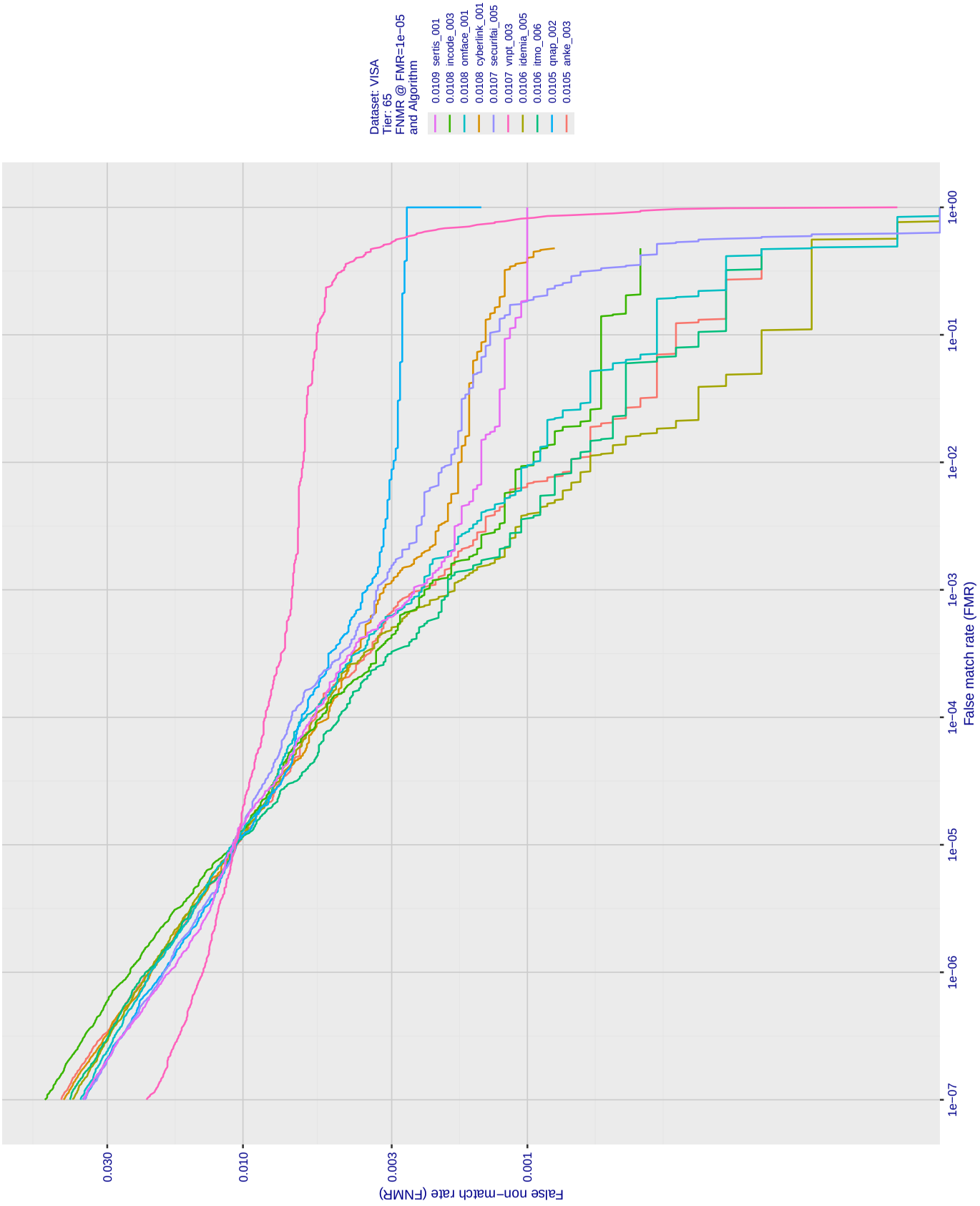

Figure 169: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

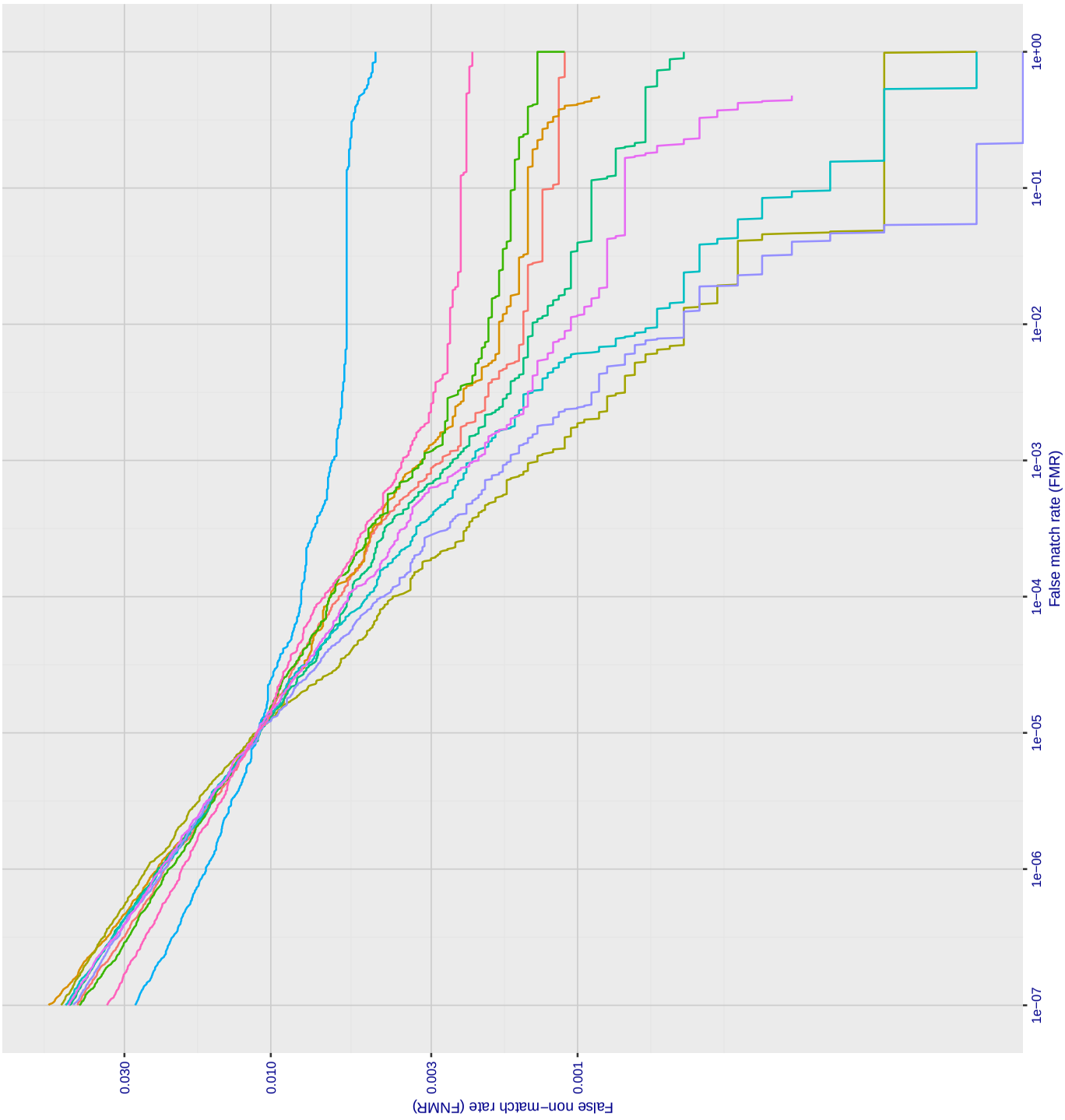

Figure 170: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

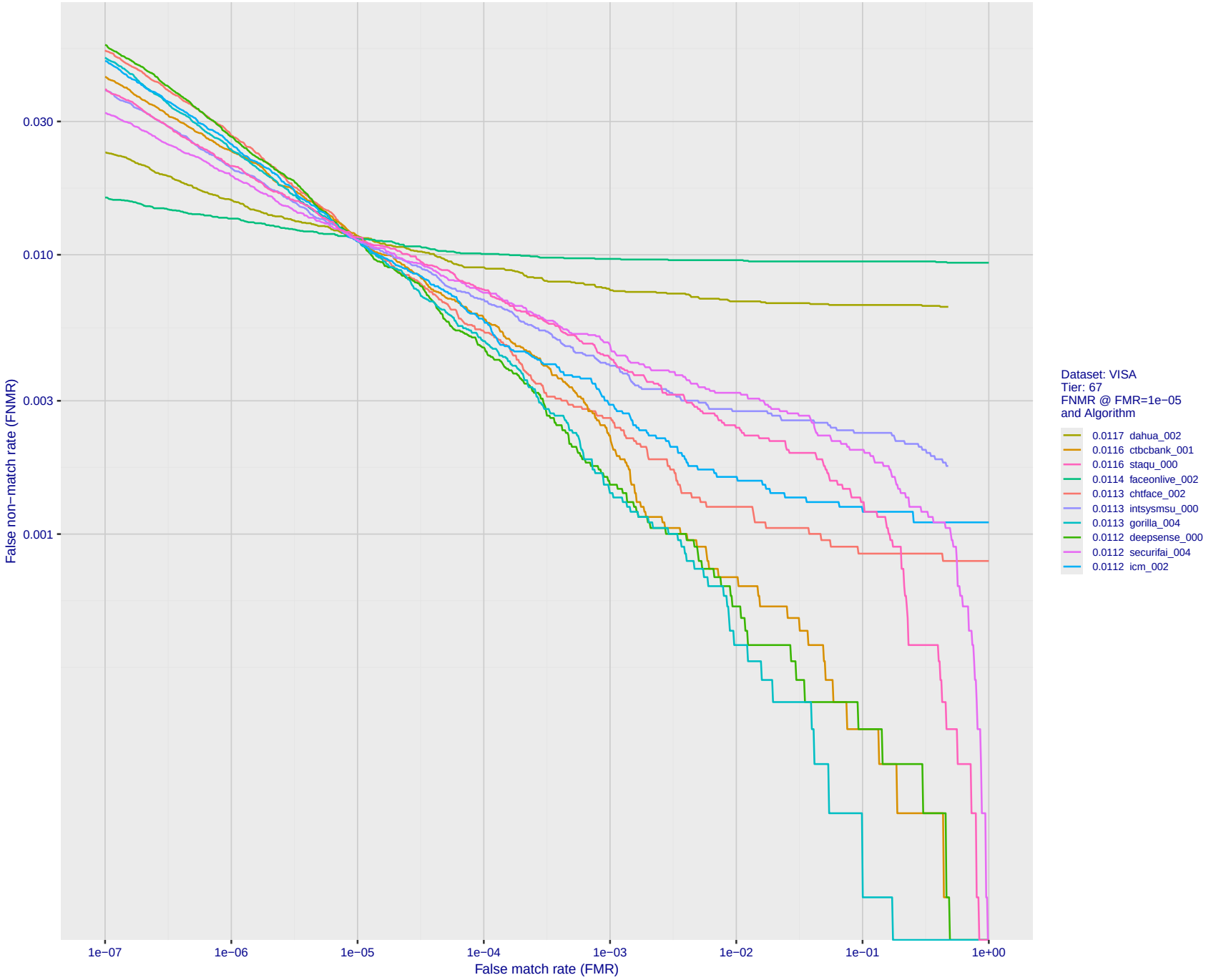

Figure 171: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

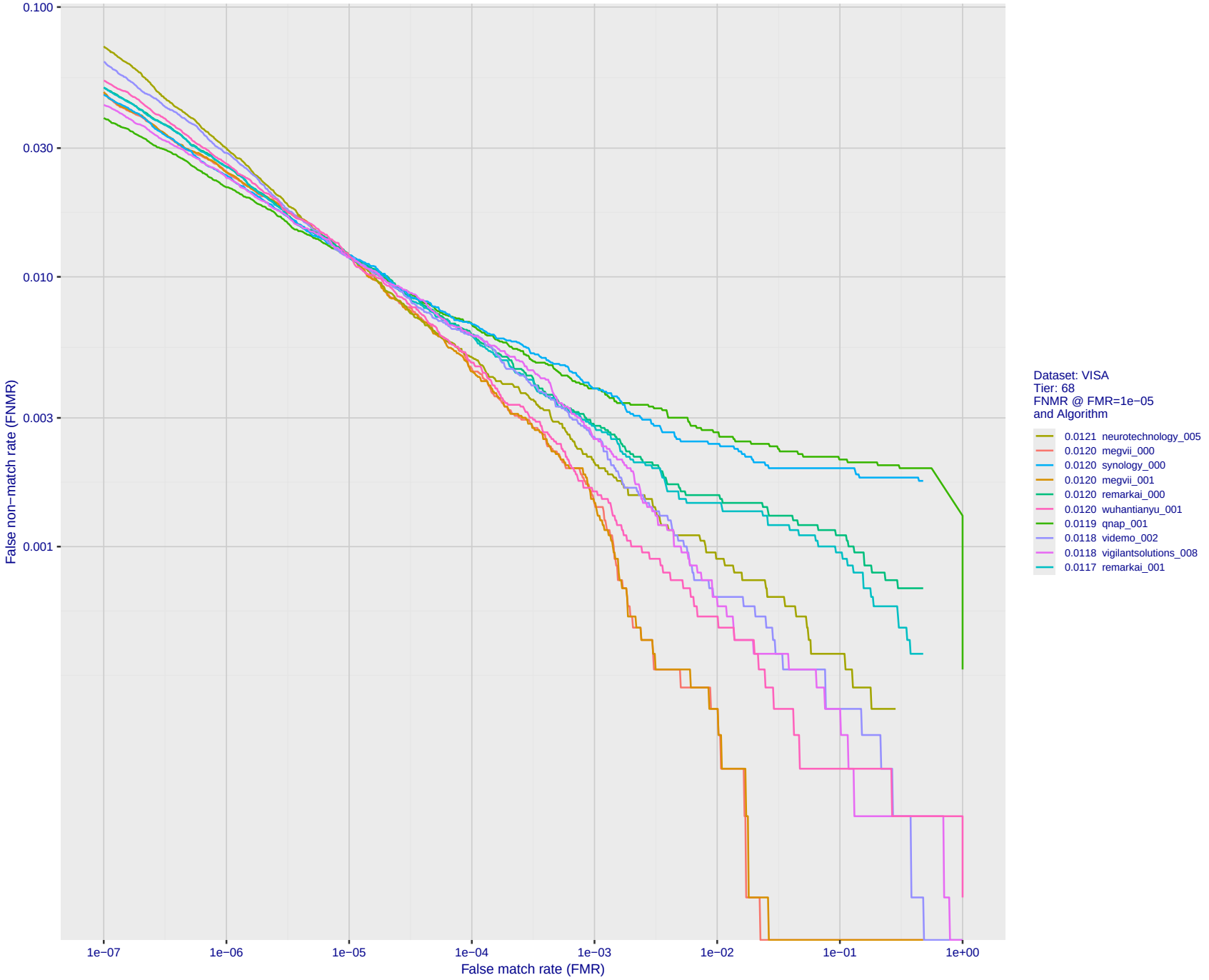

Figure 172: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

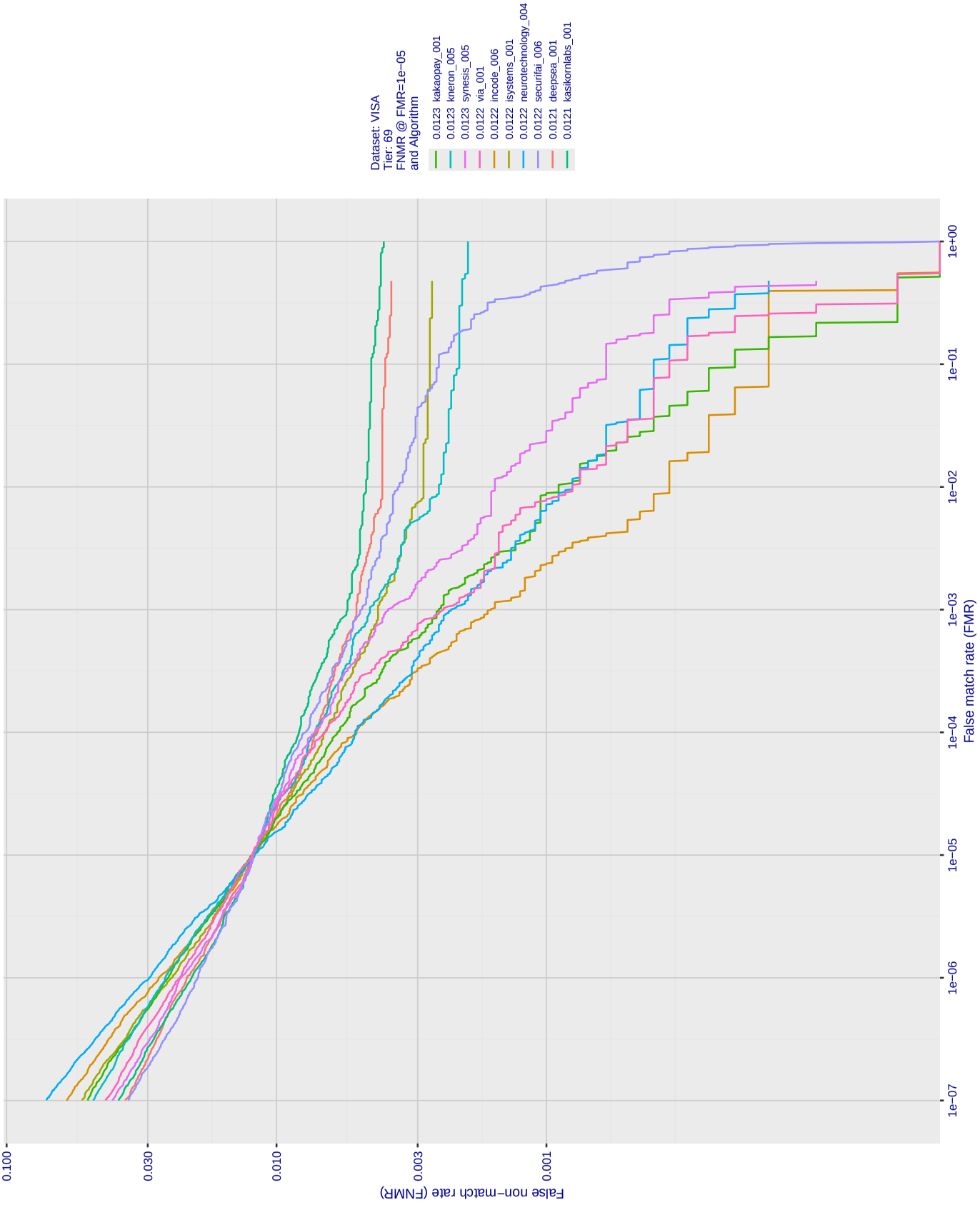

Figure 173: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

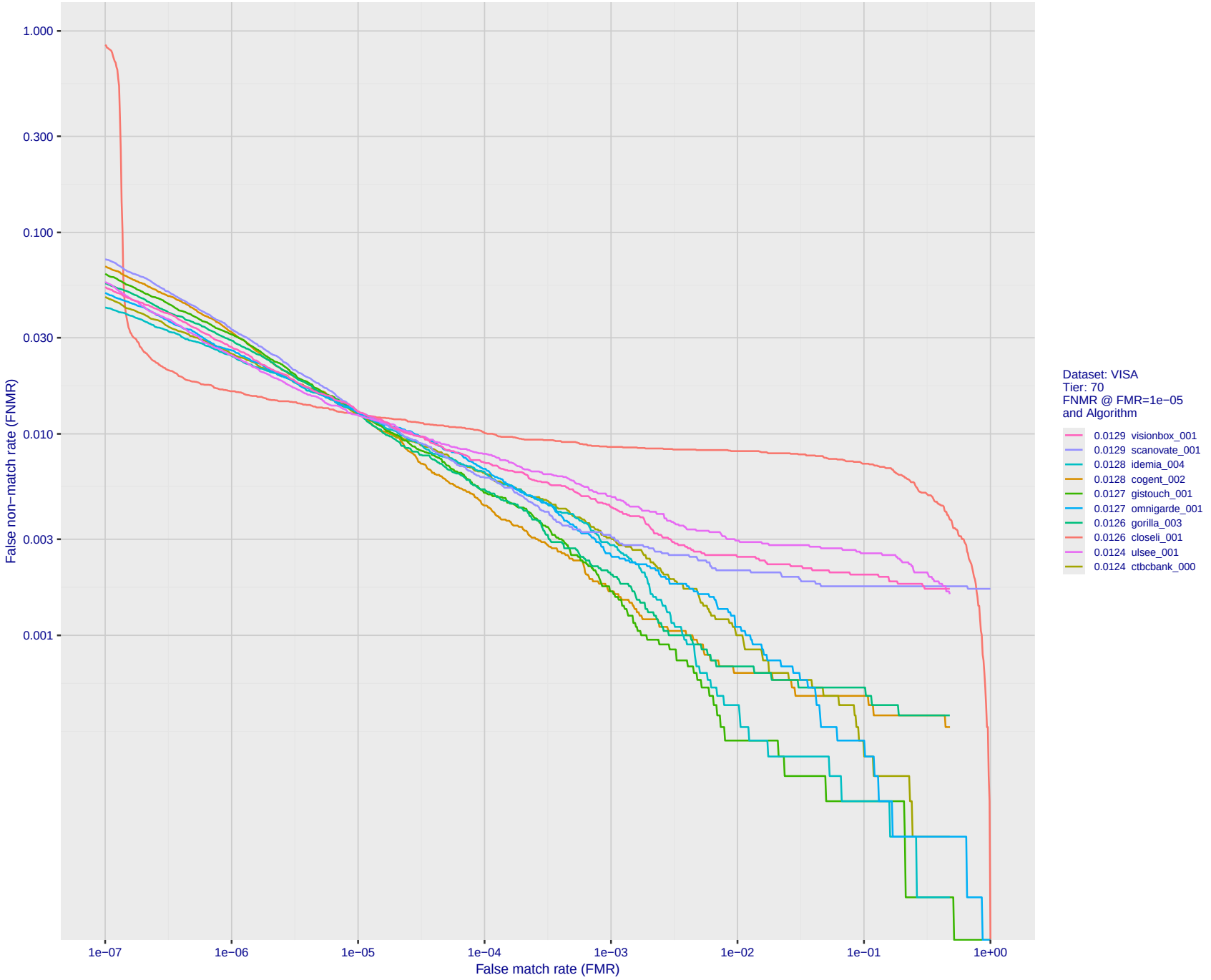

Figure 174: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

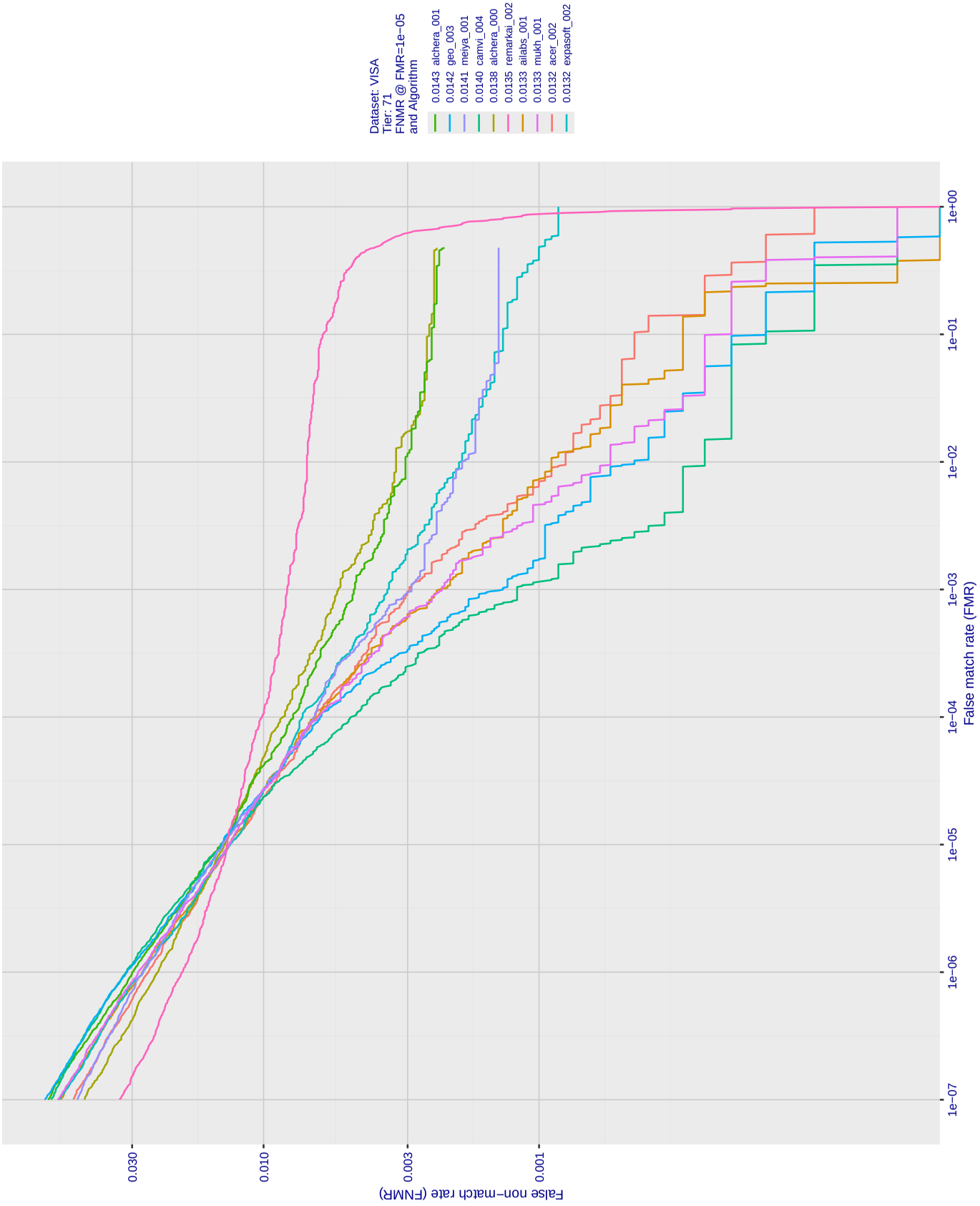

Figure 175: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

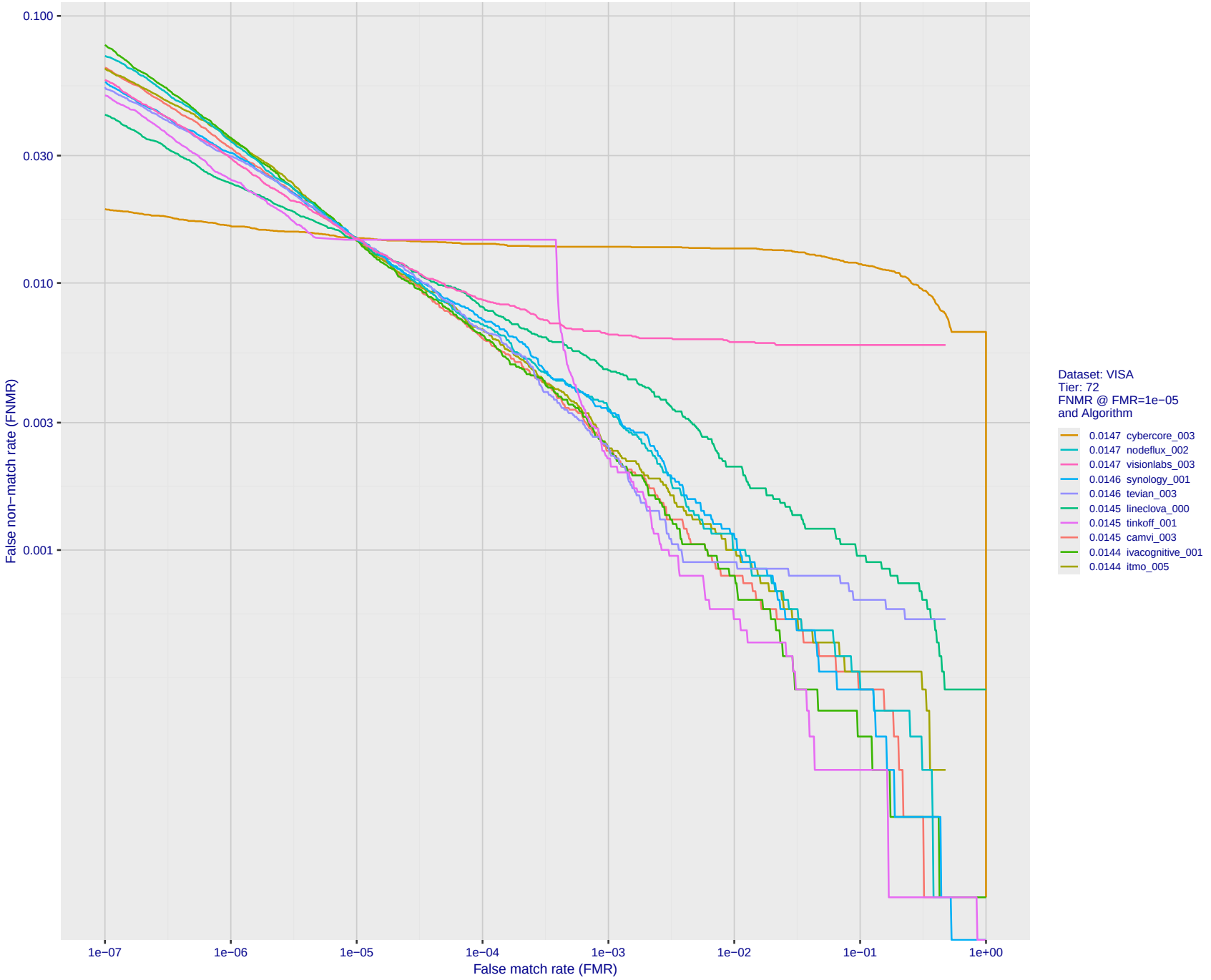

Figure 176: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

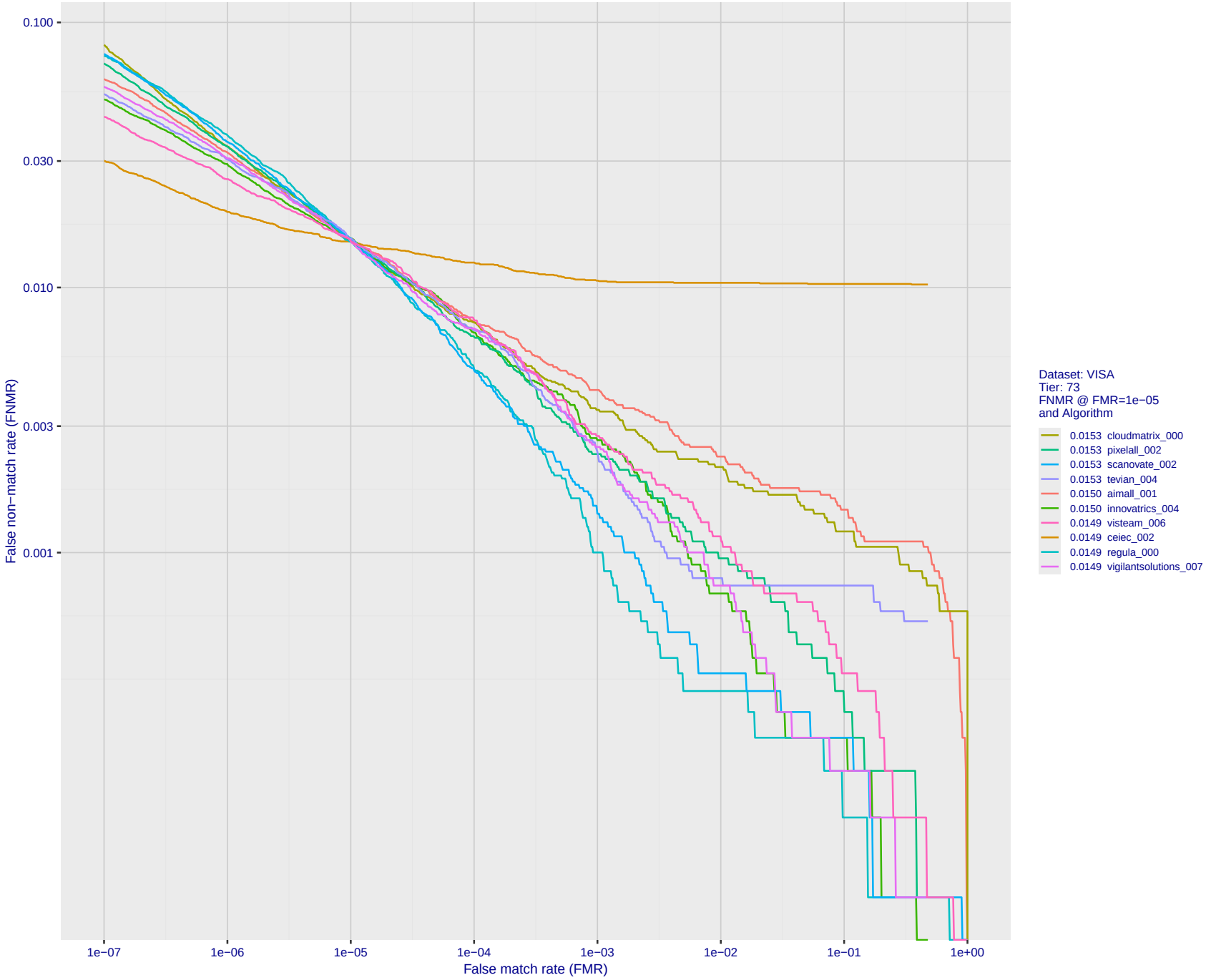

Figure 177: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

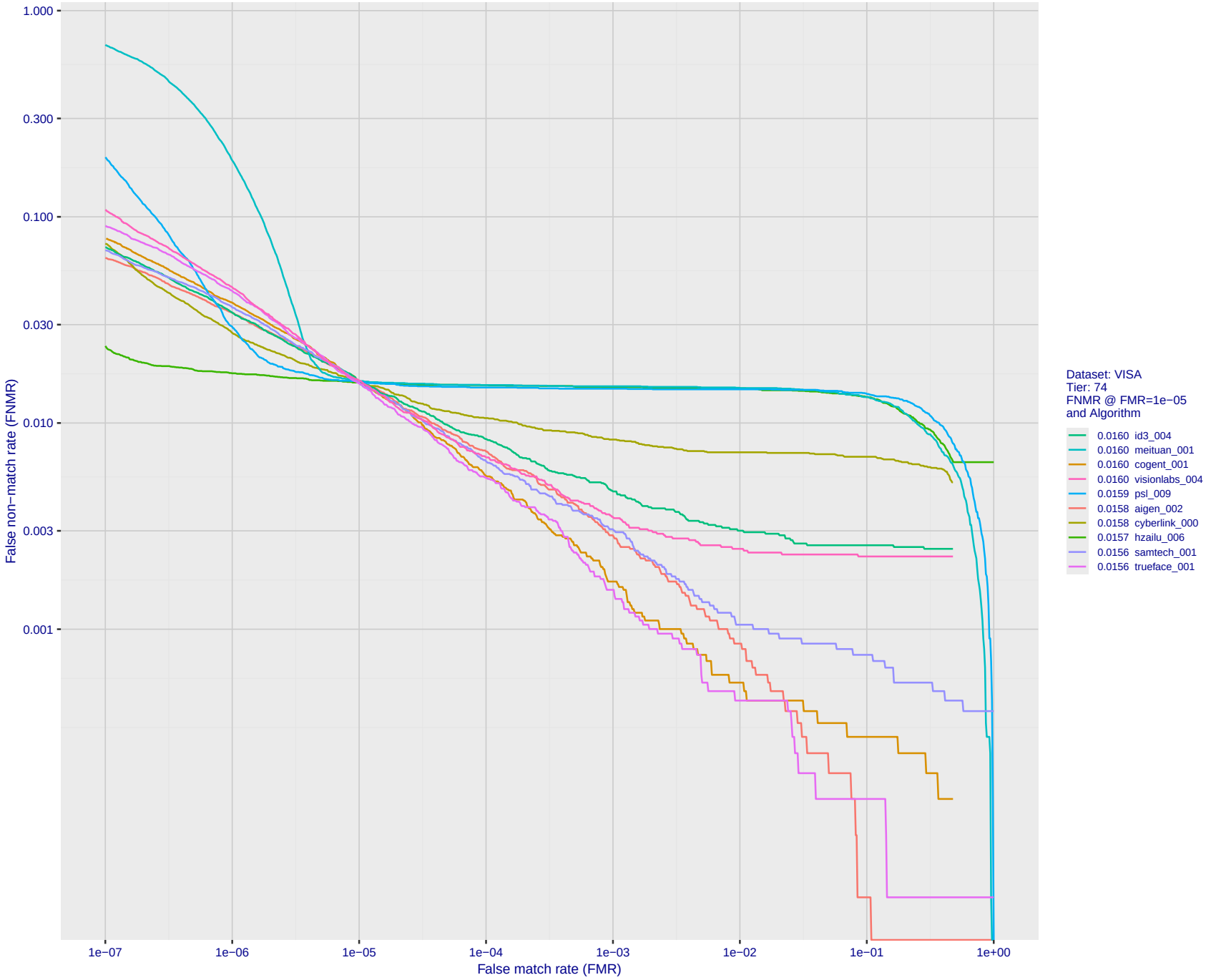

Figure 178: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

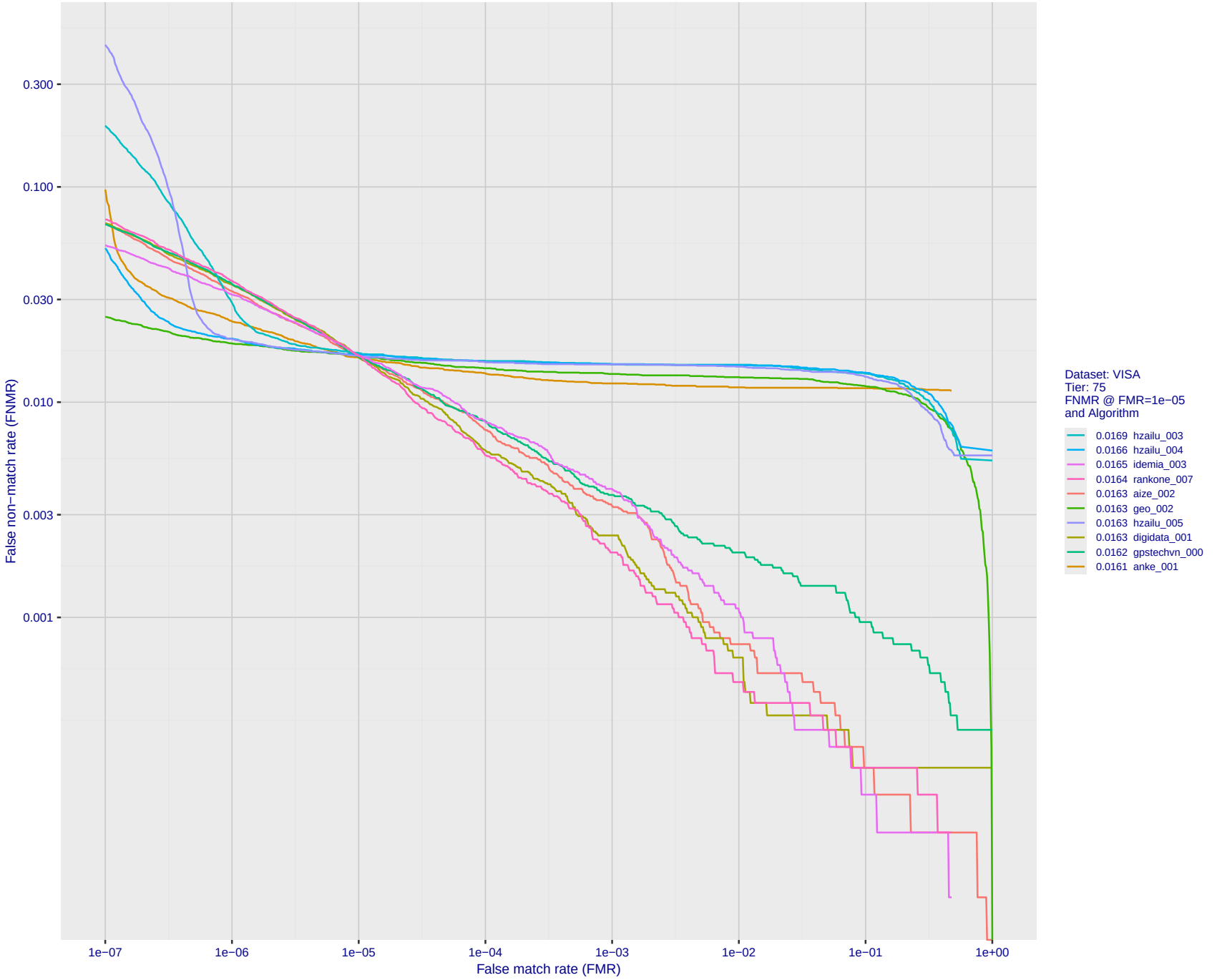

Figure 179: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

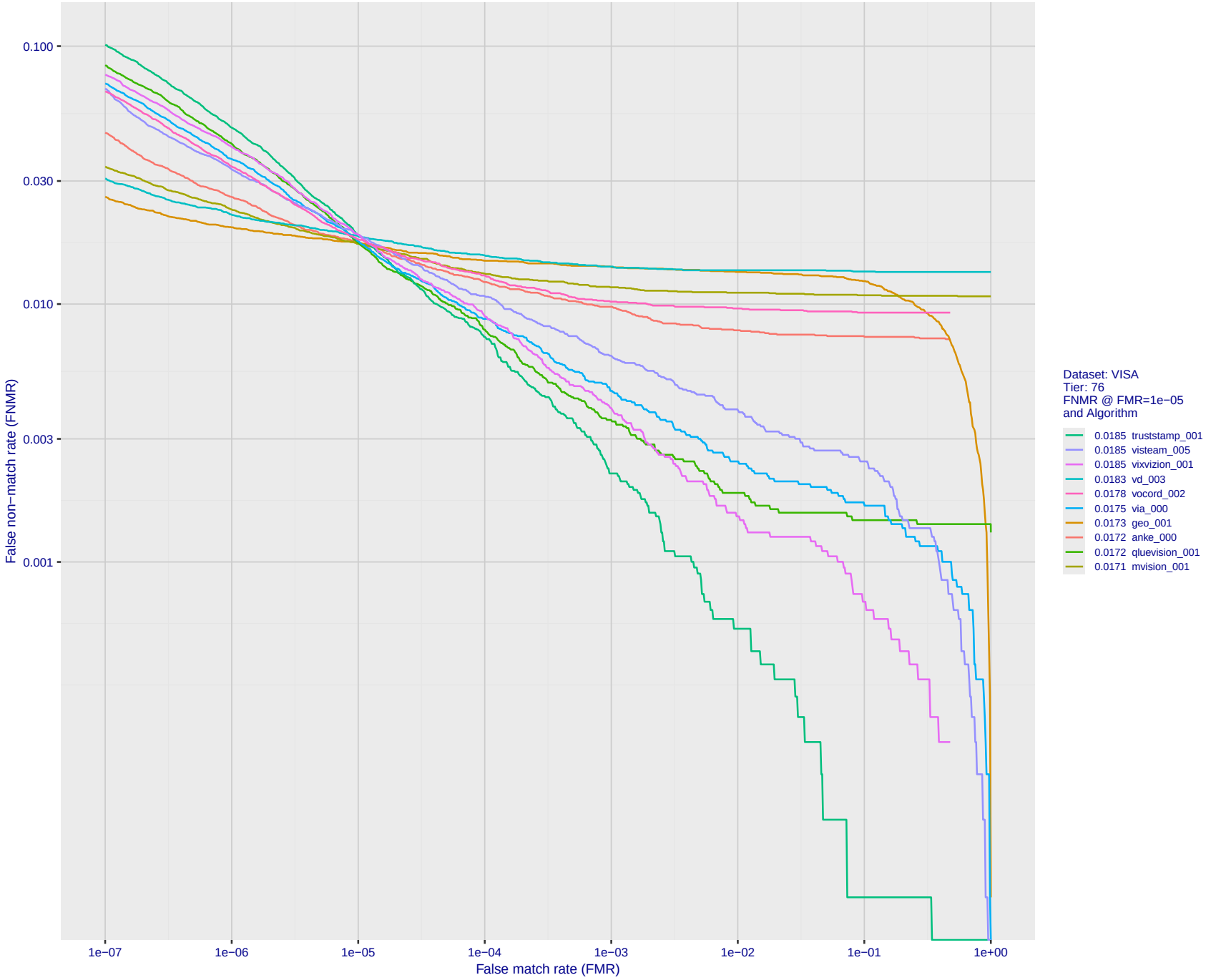

Figure 180: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

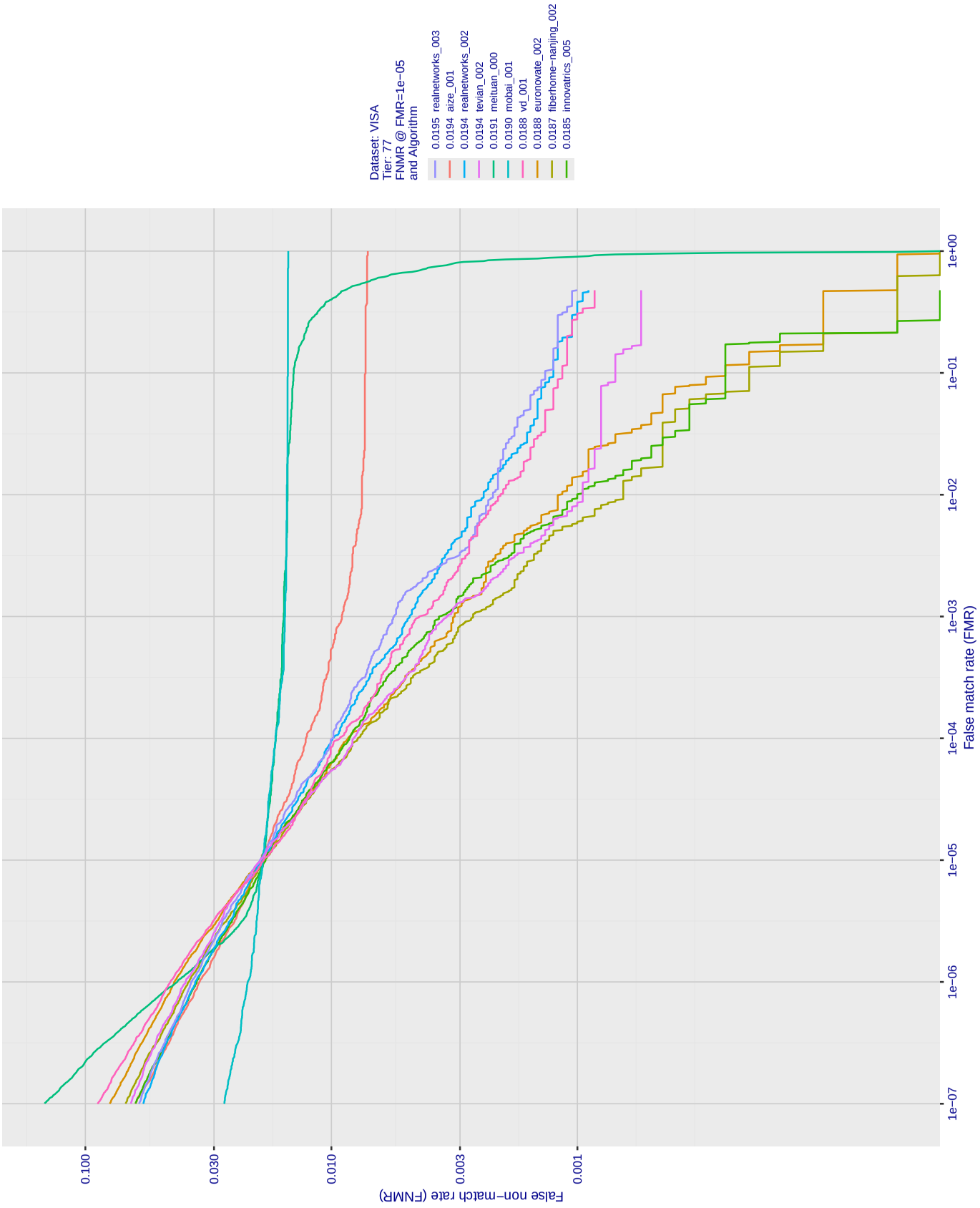

Figure 181: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

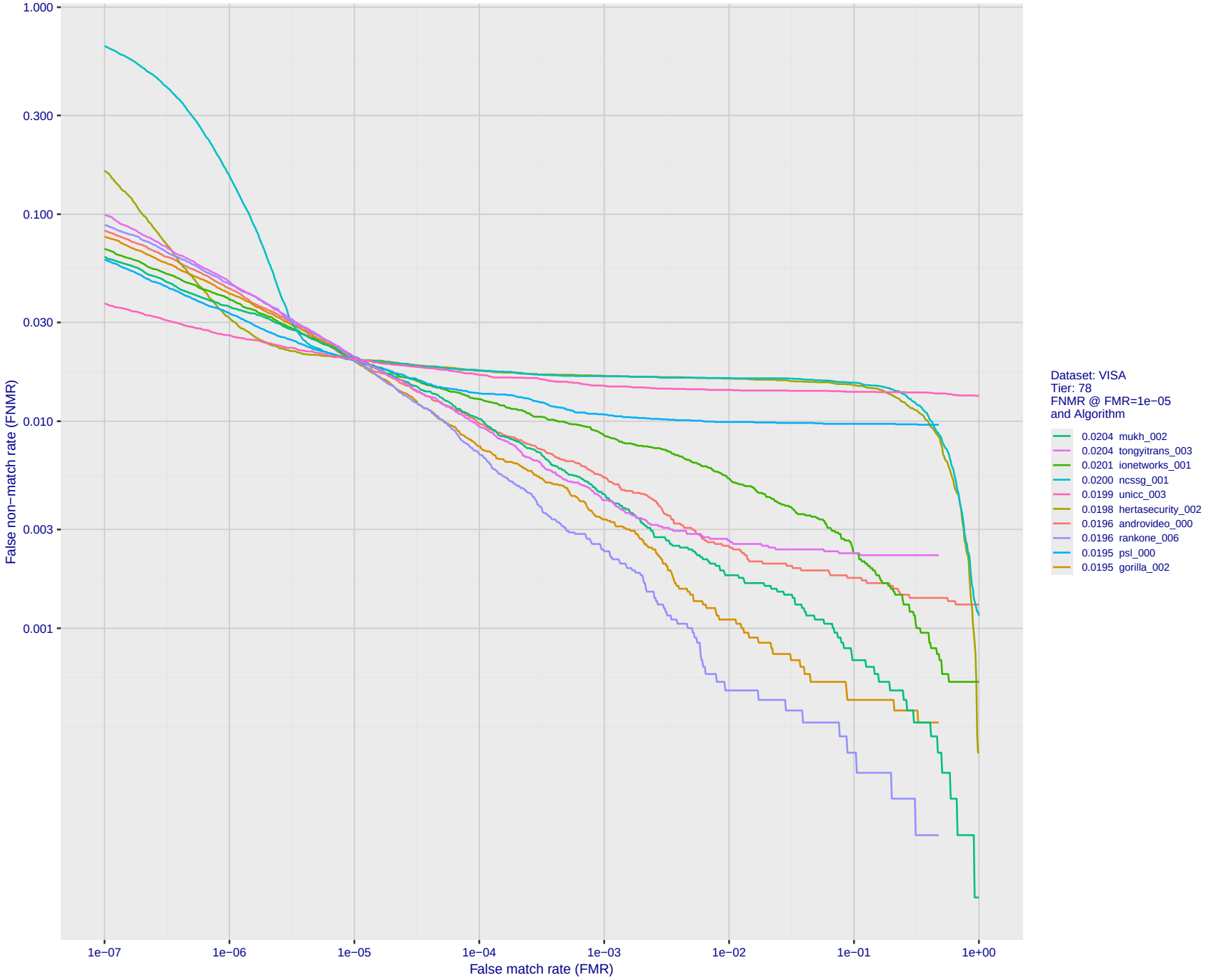

Figure 182: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

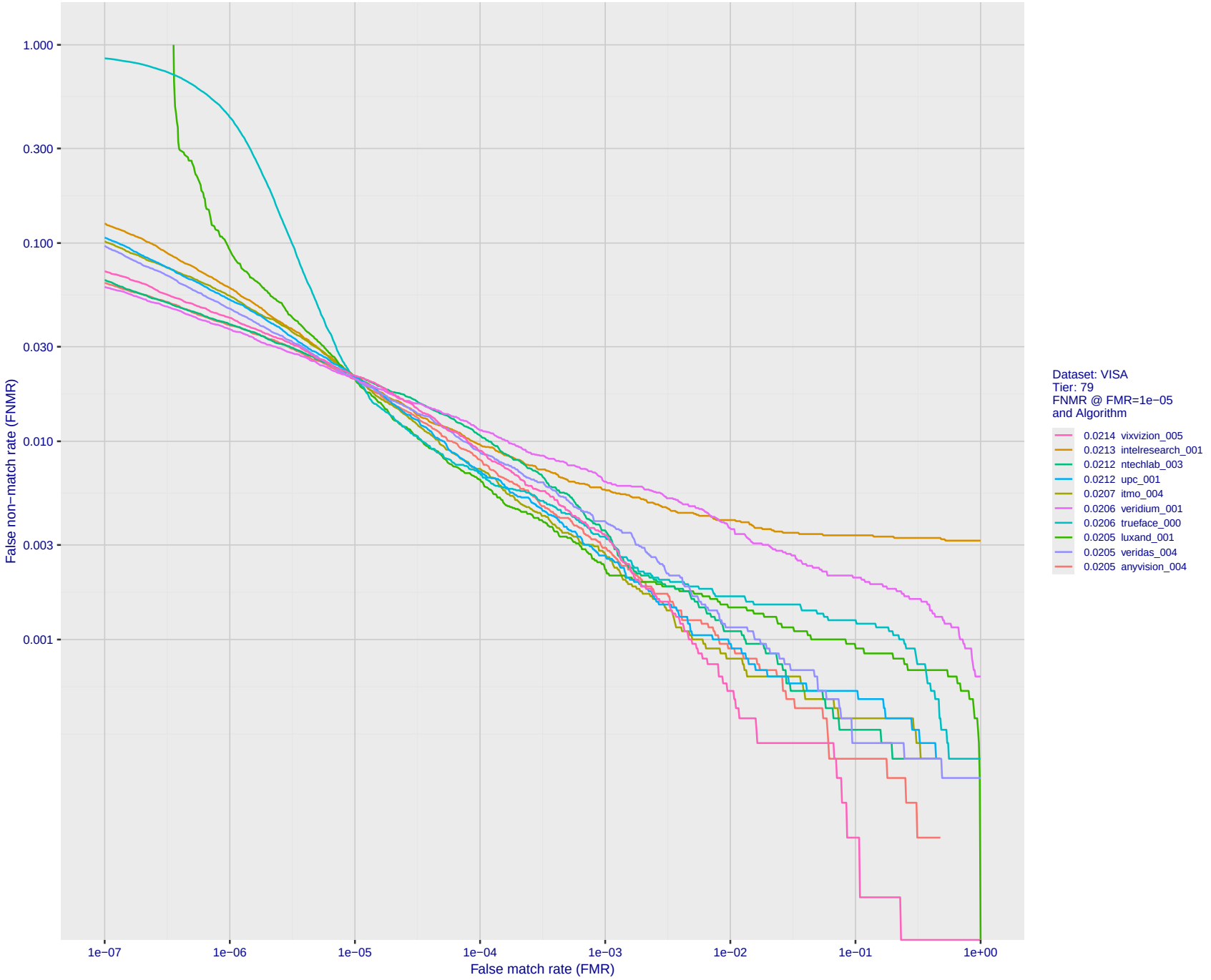

Figure 183: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

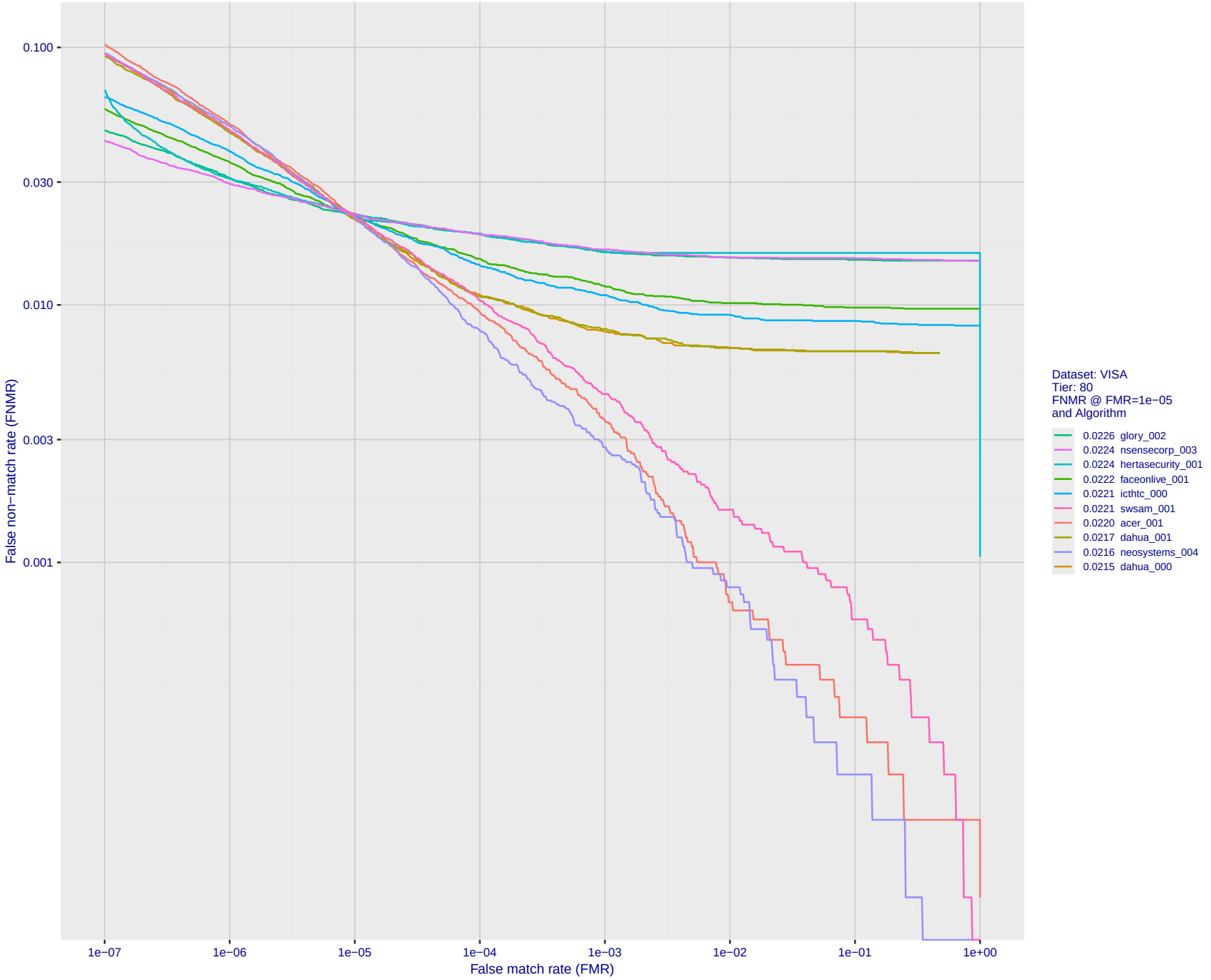

Figure 184: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

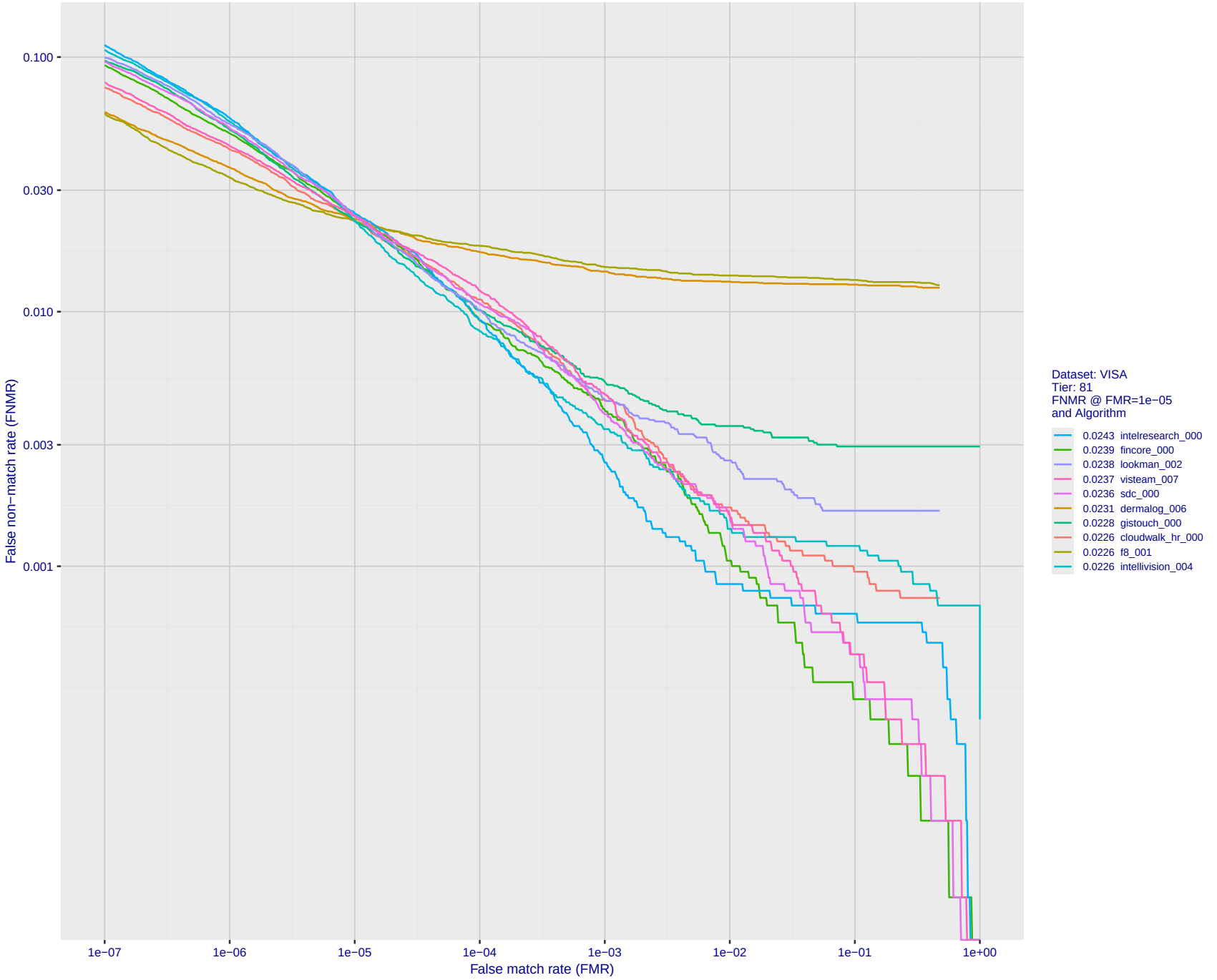

Figure 185: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

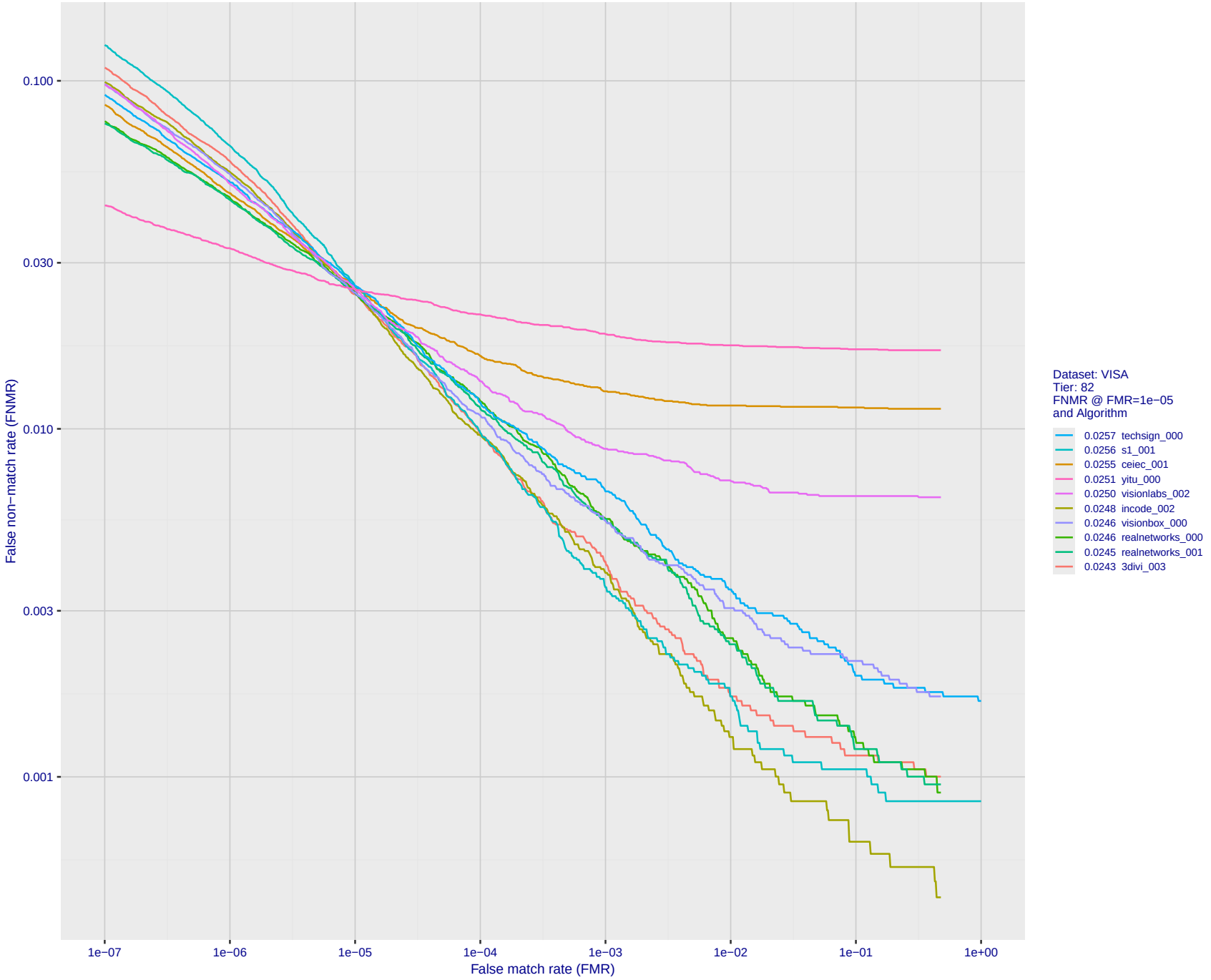

Figure 186: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

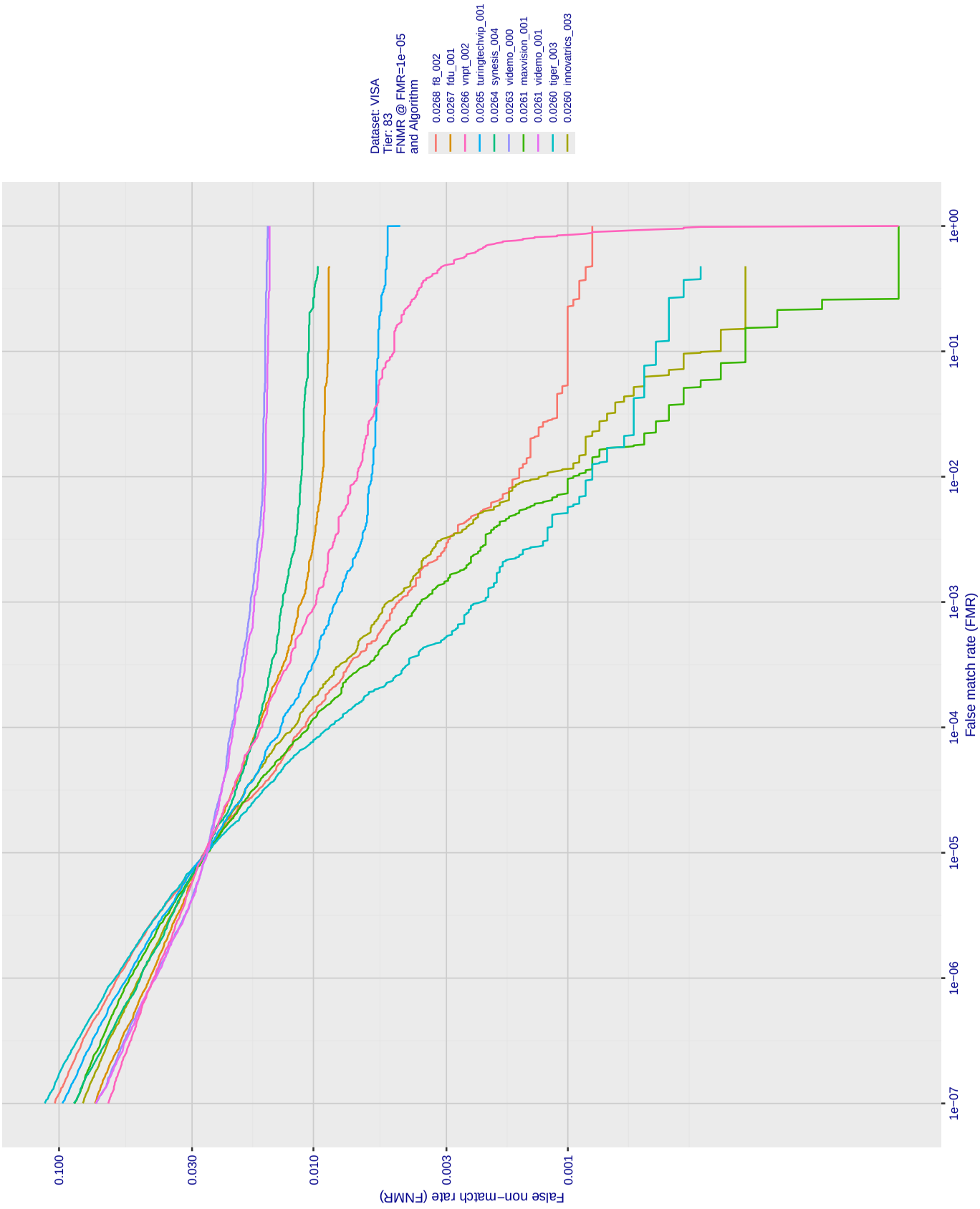

Figure 187: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

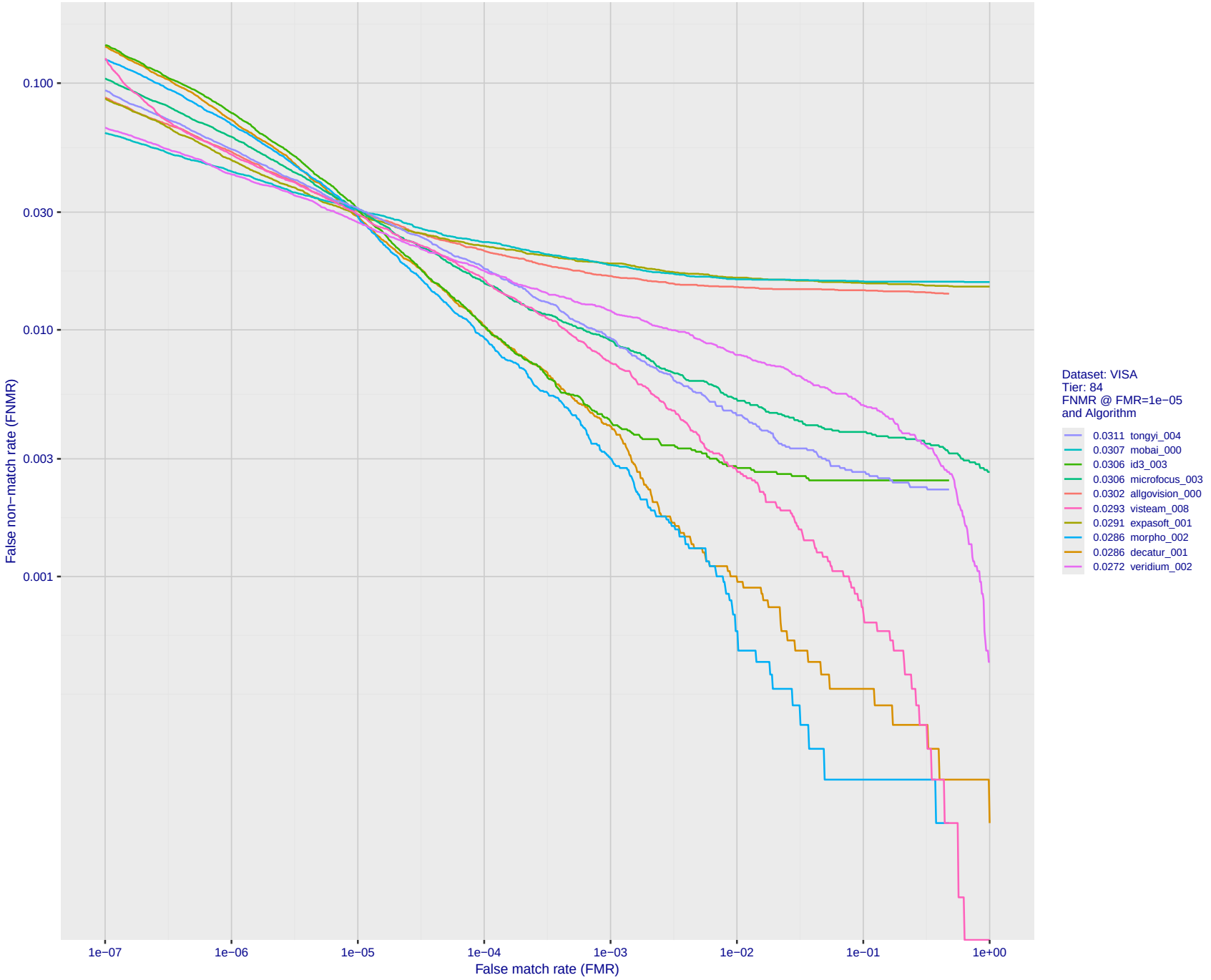

Figure 188: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

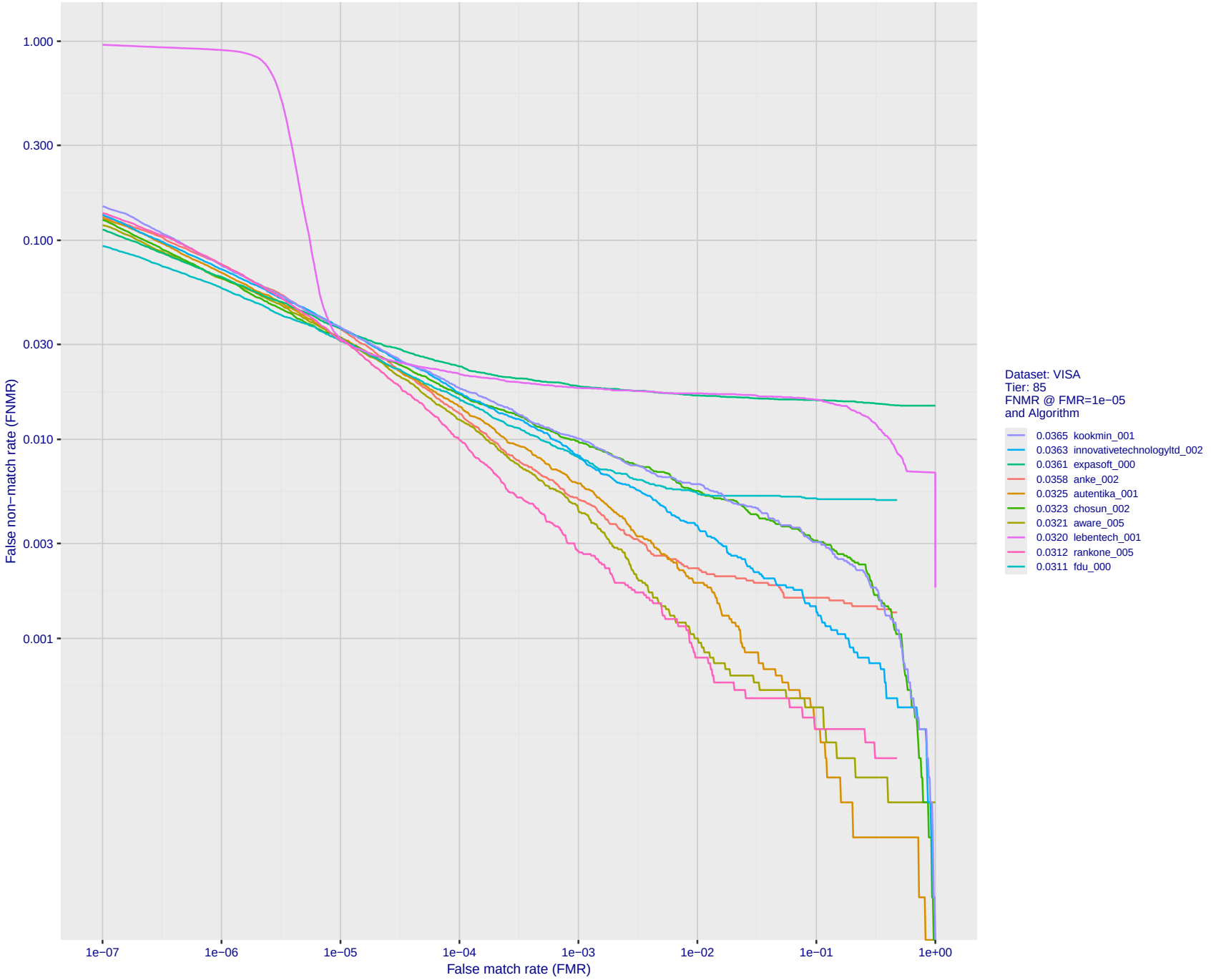

Figure 189: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

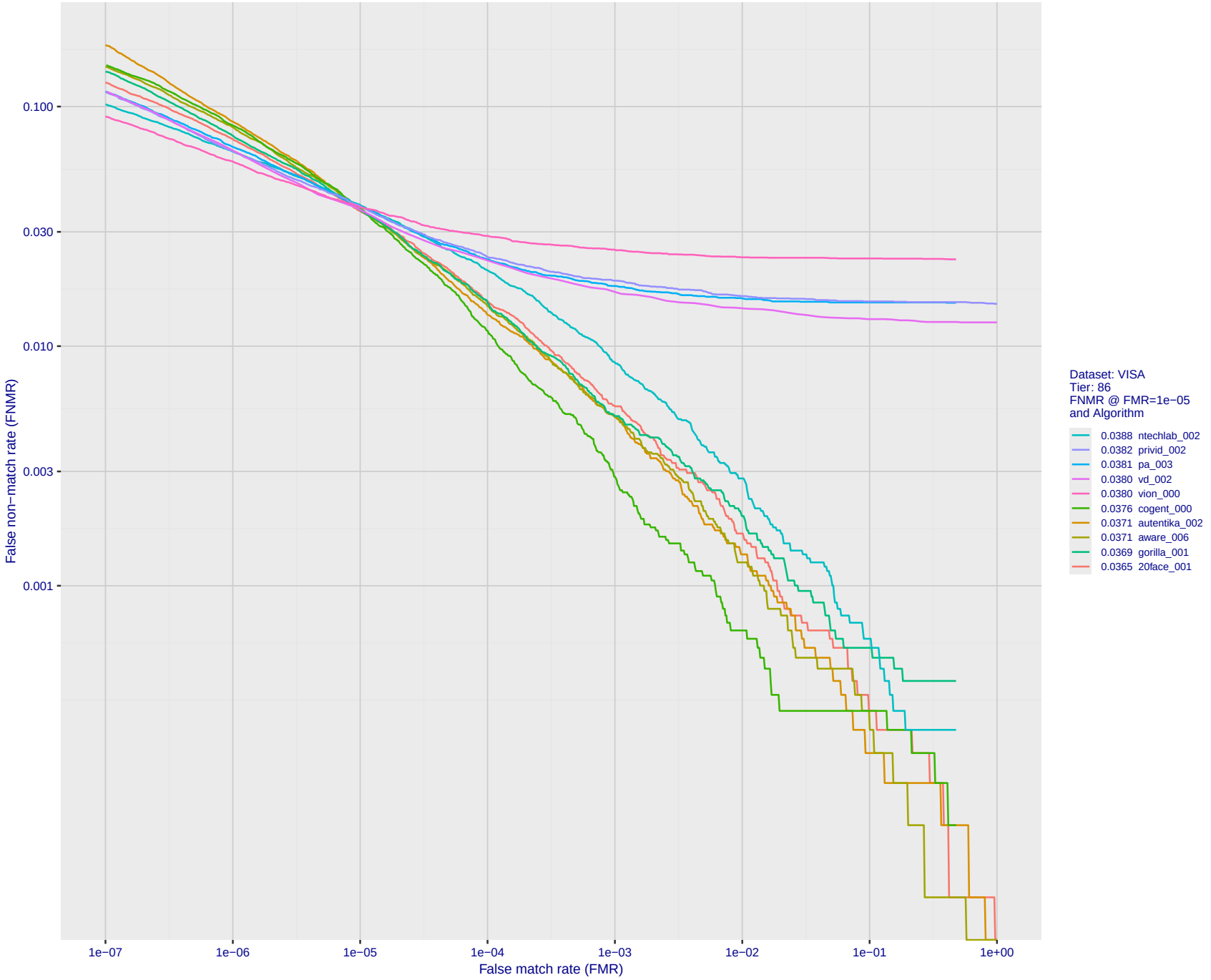

Figure 190: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

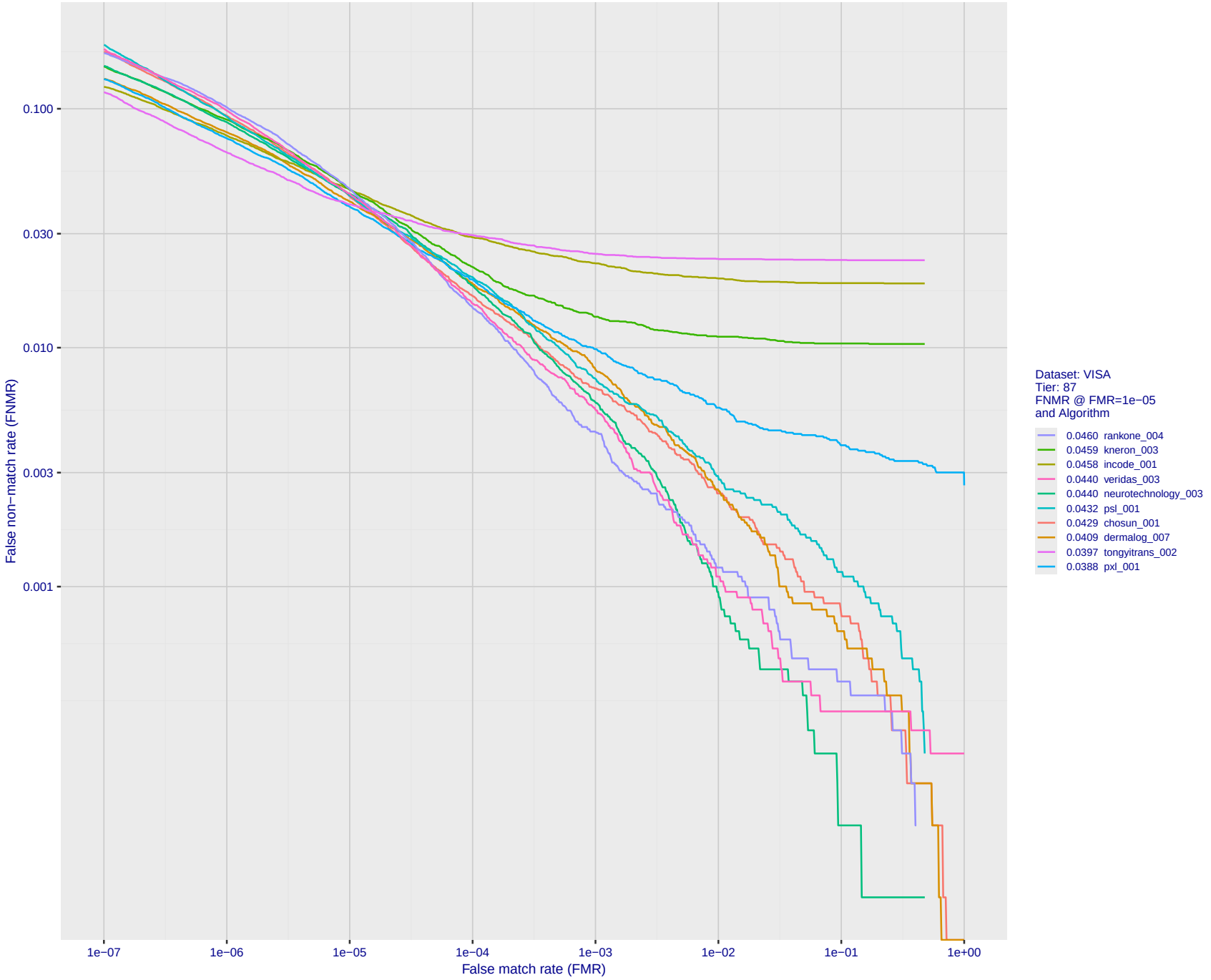

Figure 191: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

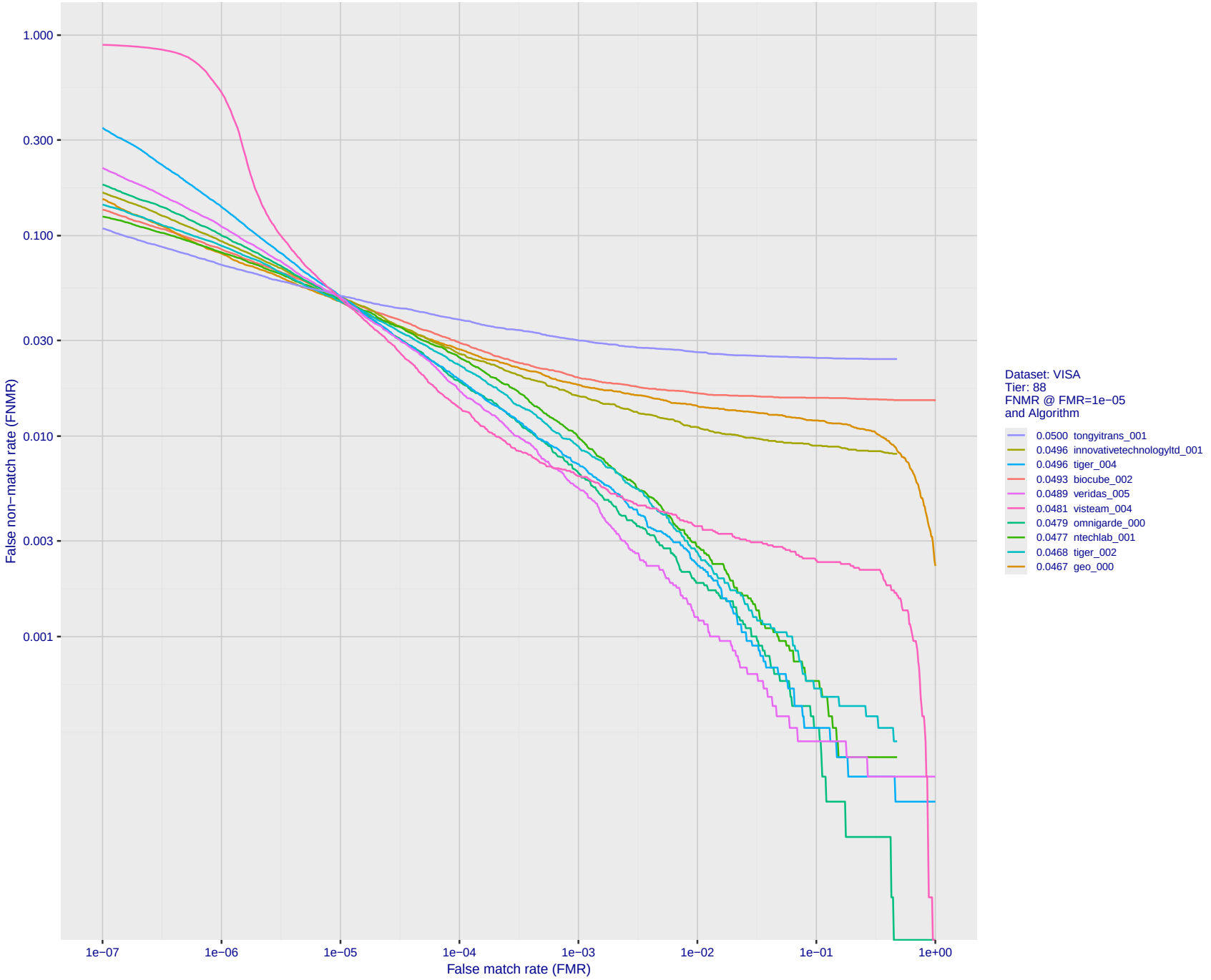

Figure 192: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

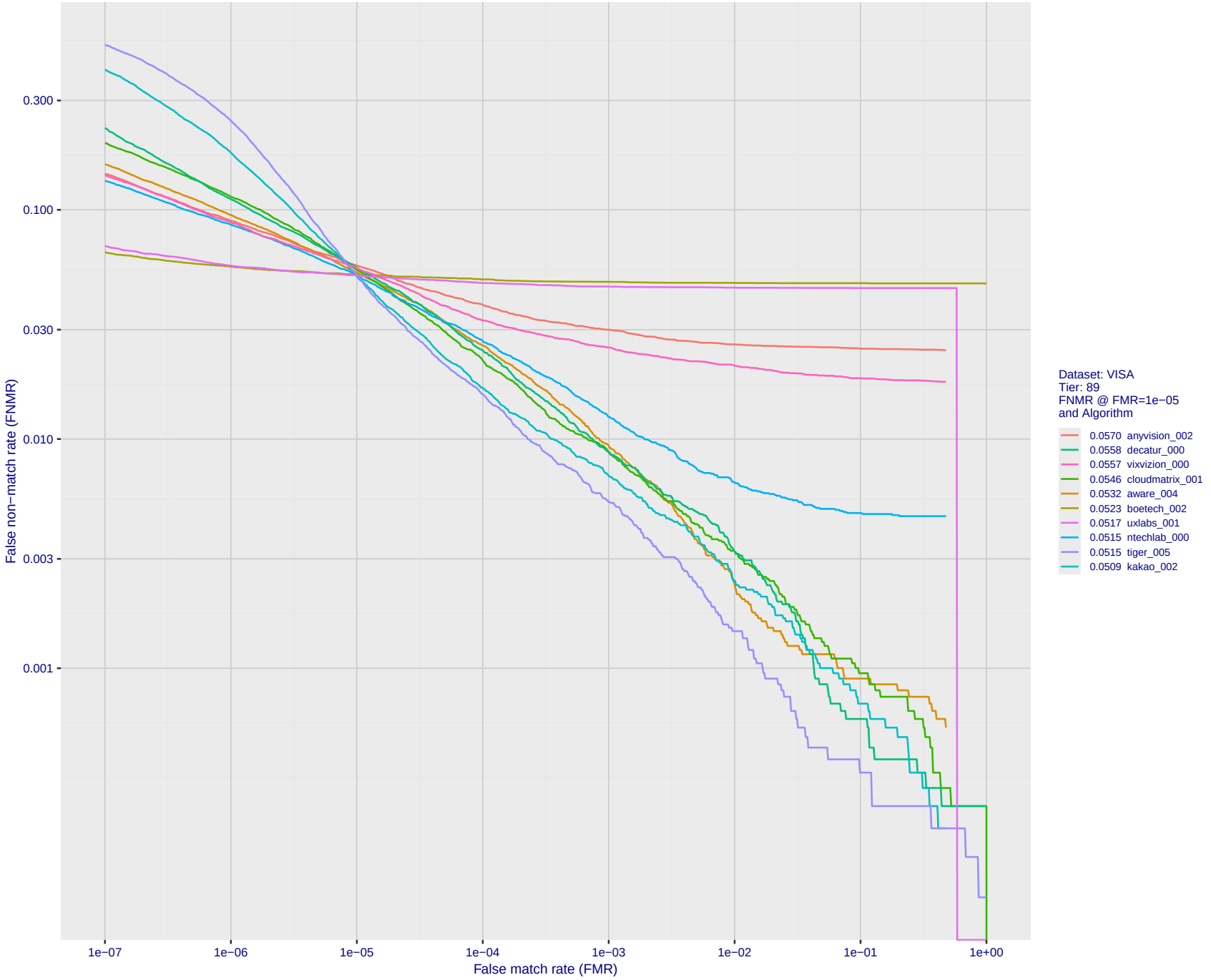

Figure 193: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

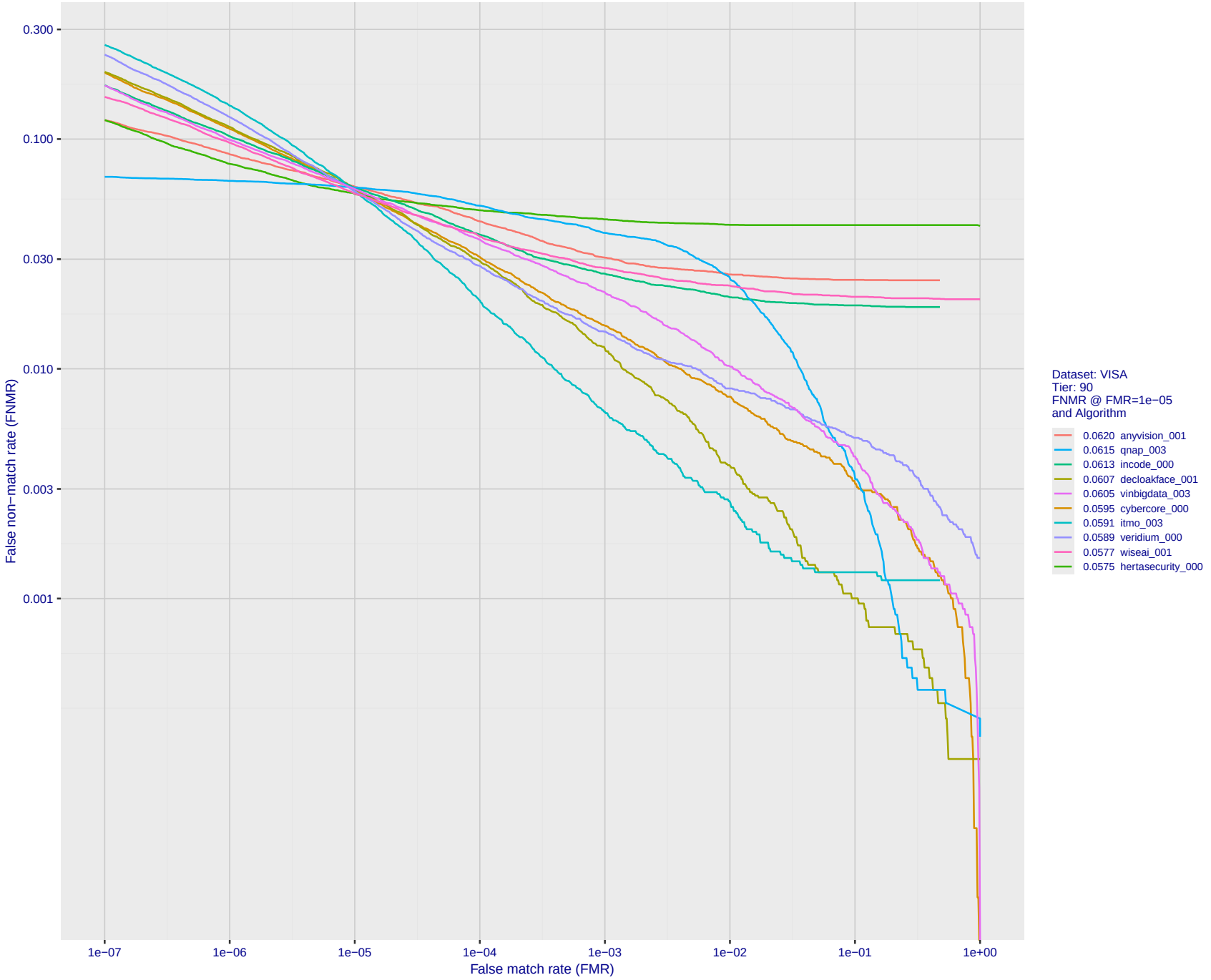

Figure 194: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

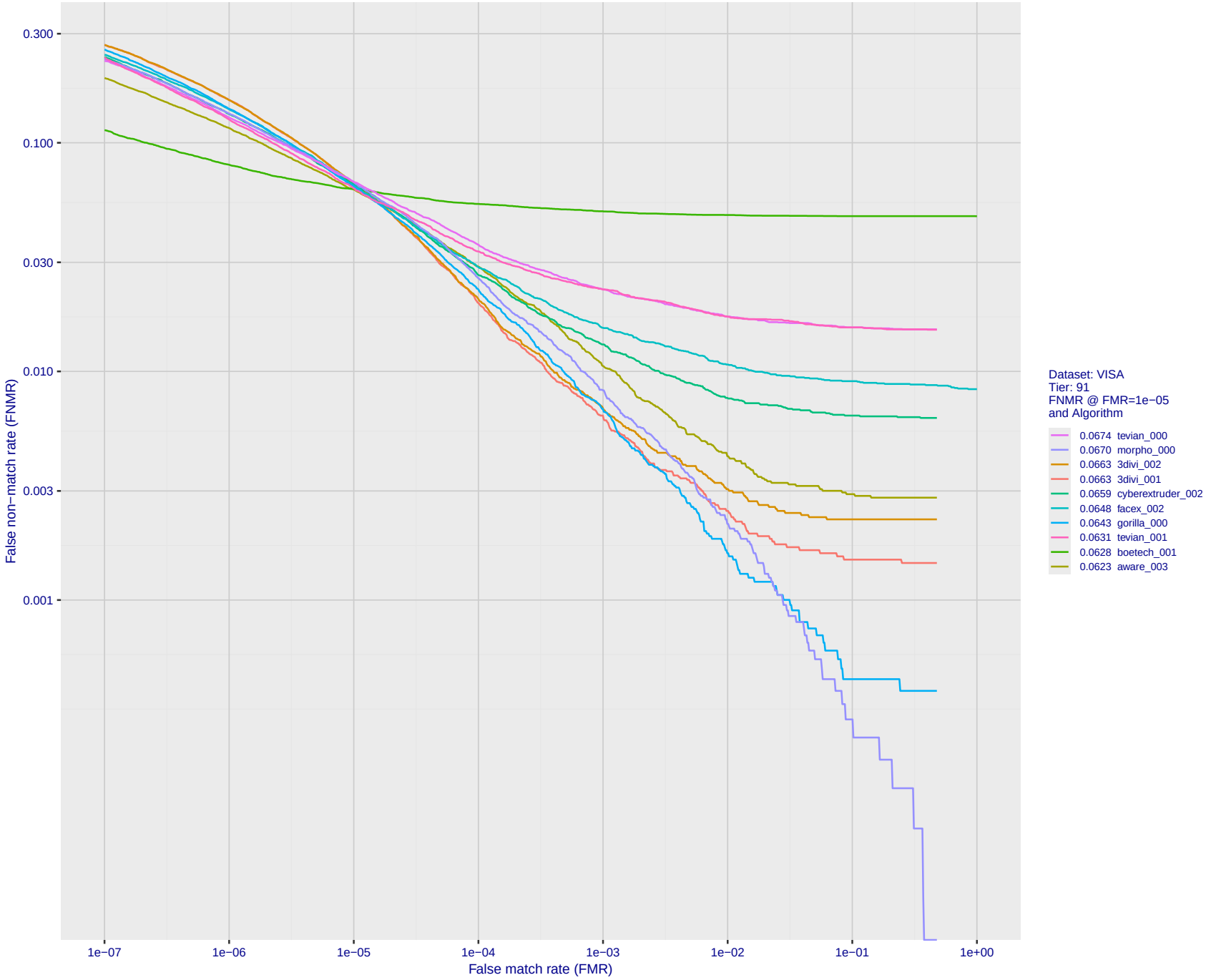

Figure 195: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

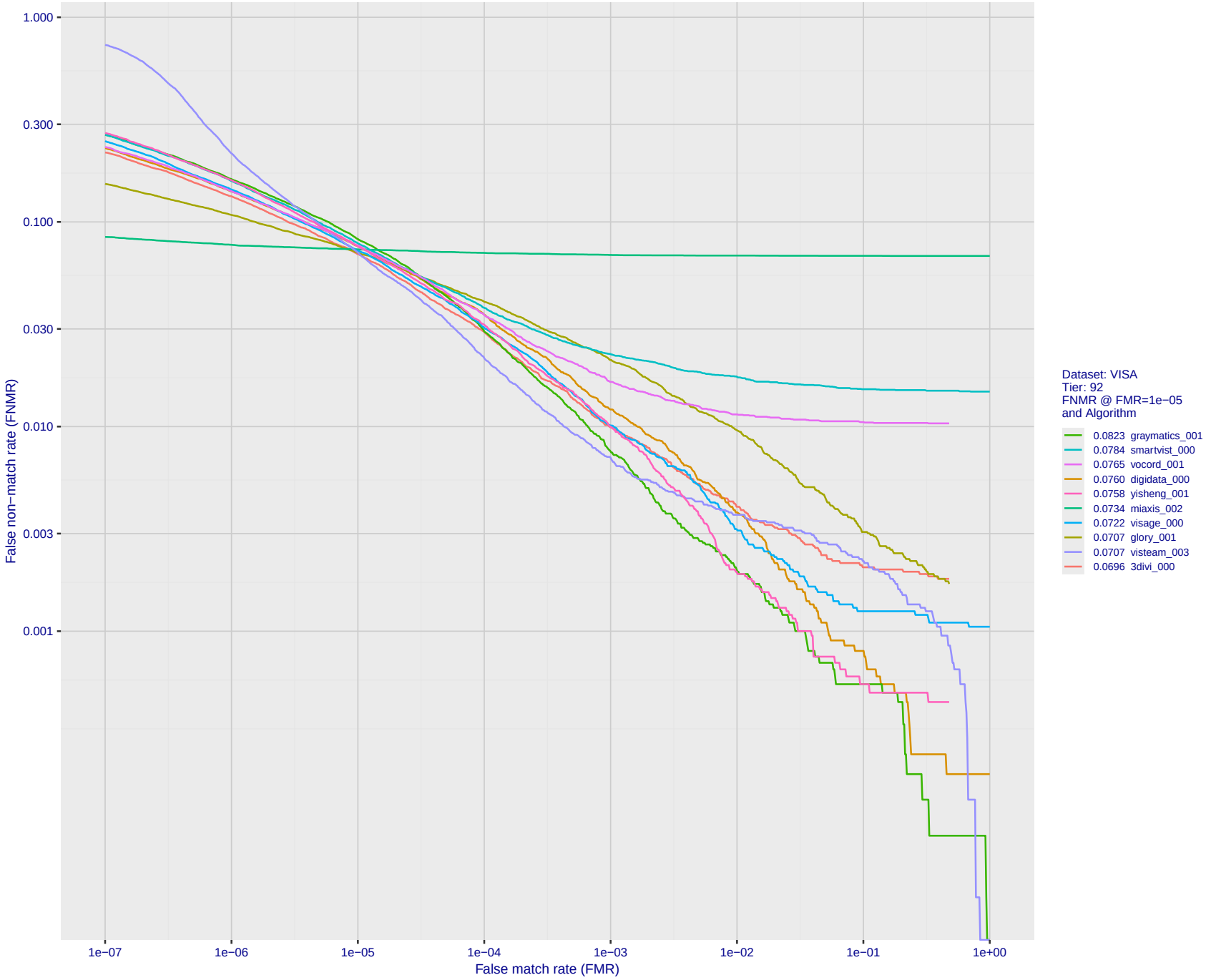

Figure 196: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

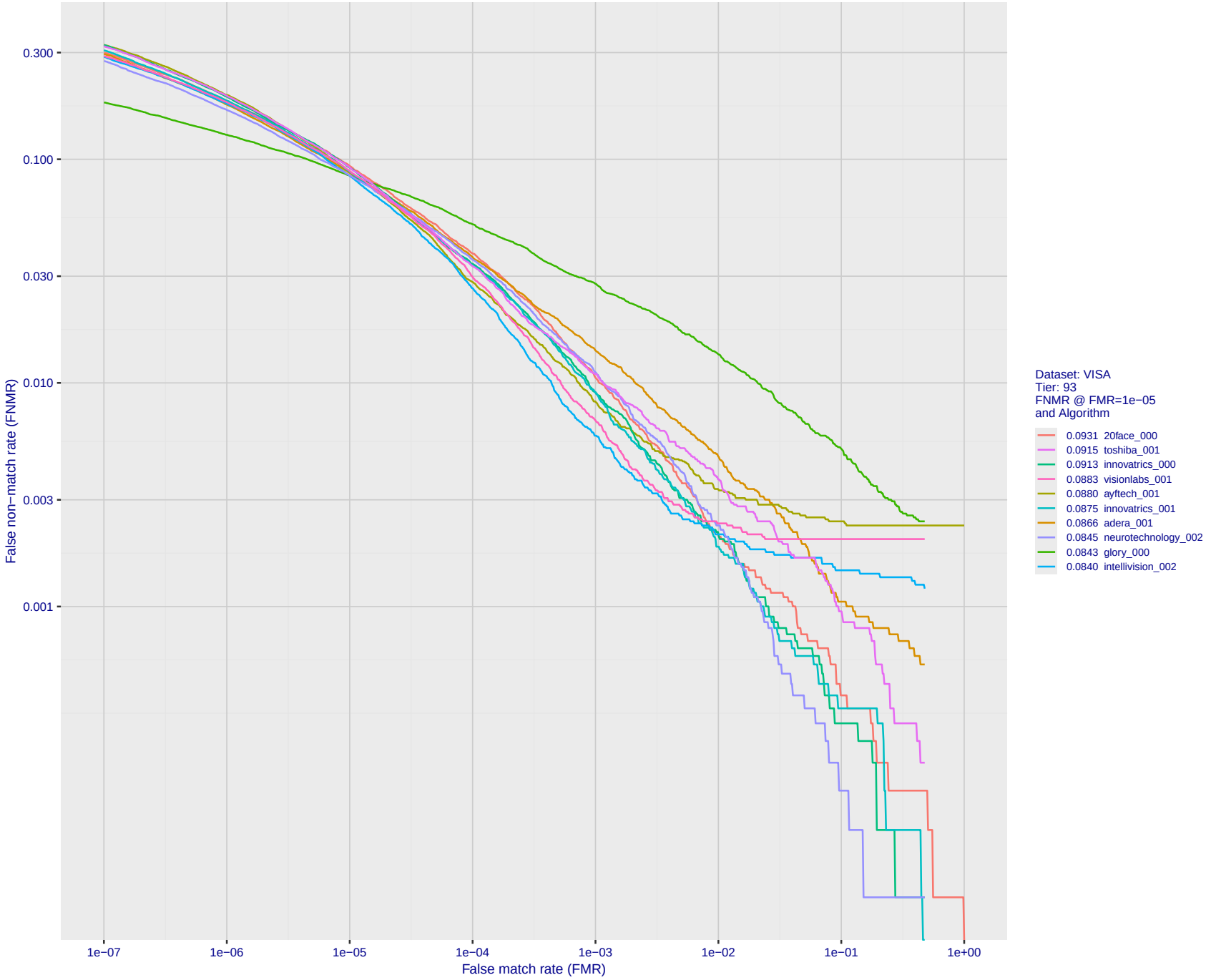

Figure 197: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

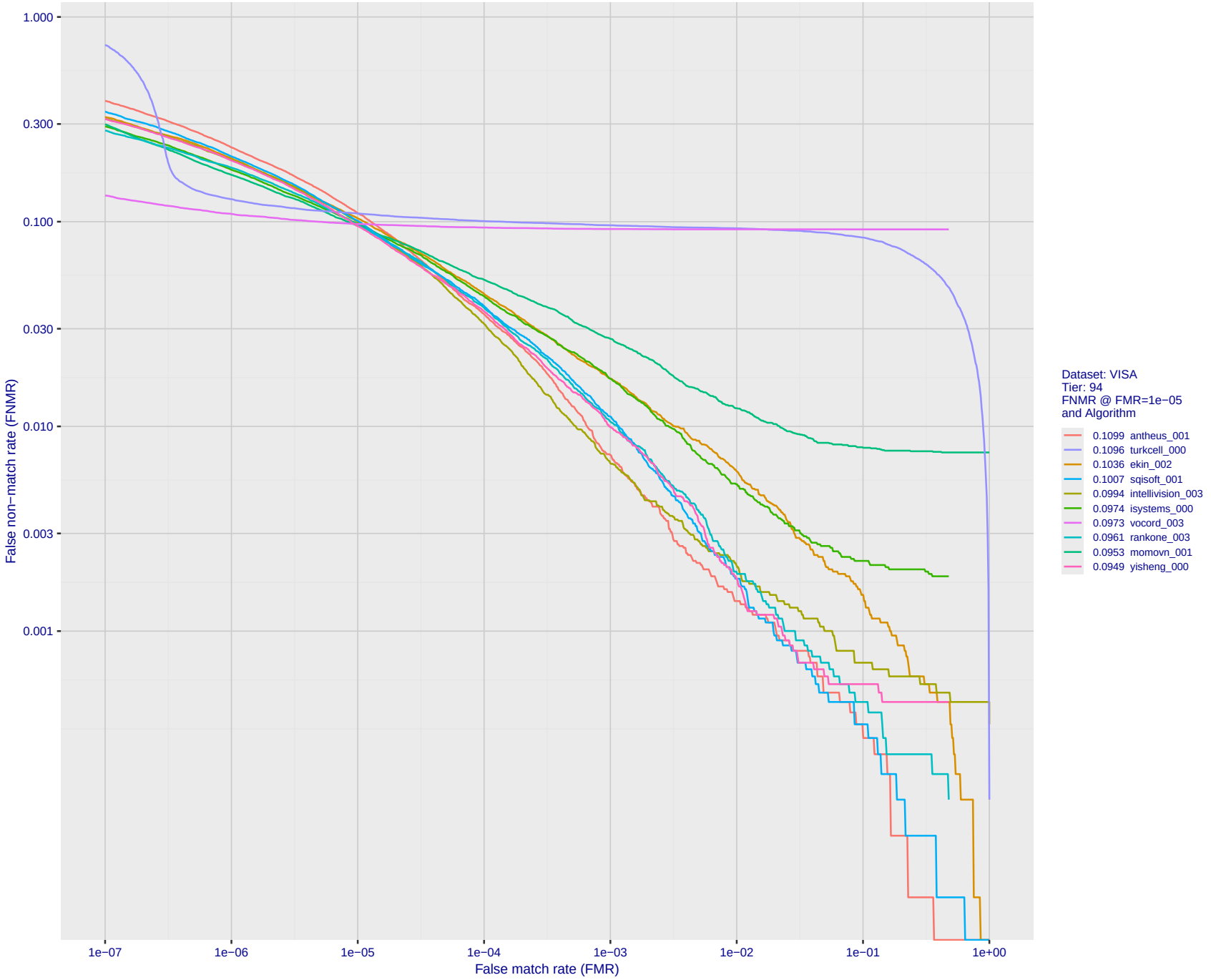

Figure 198: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

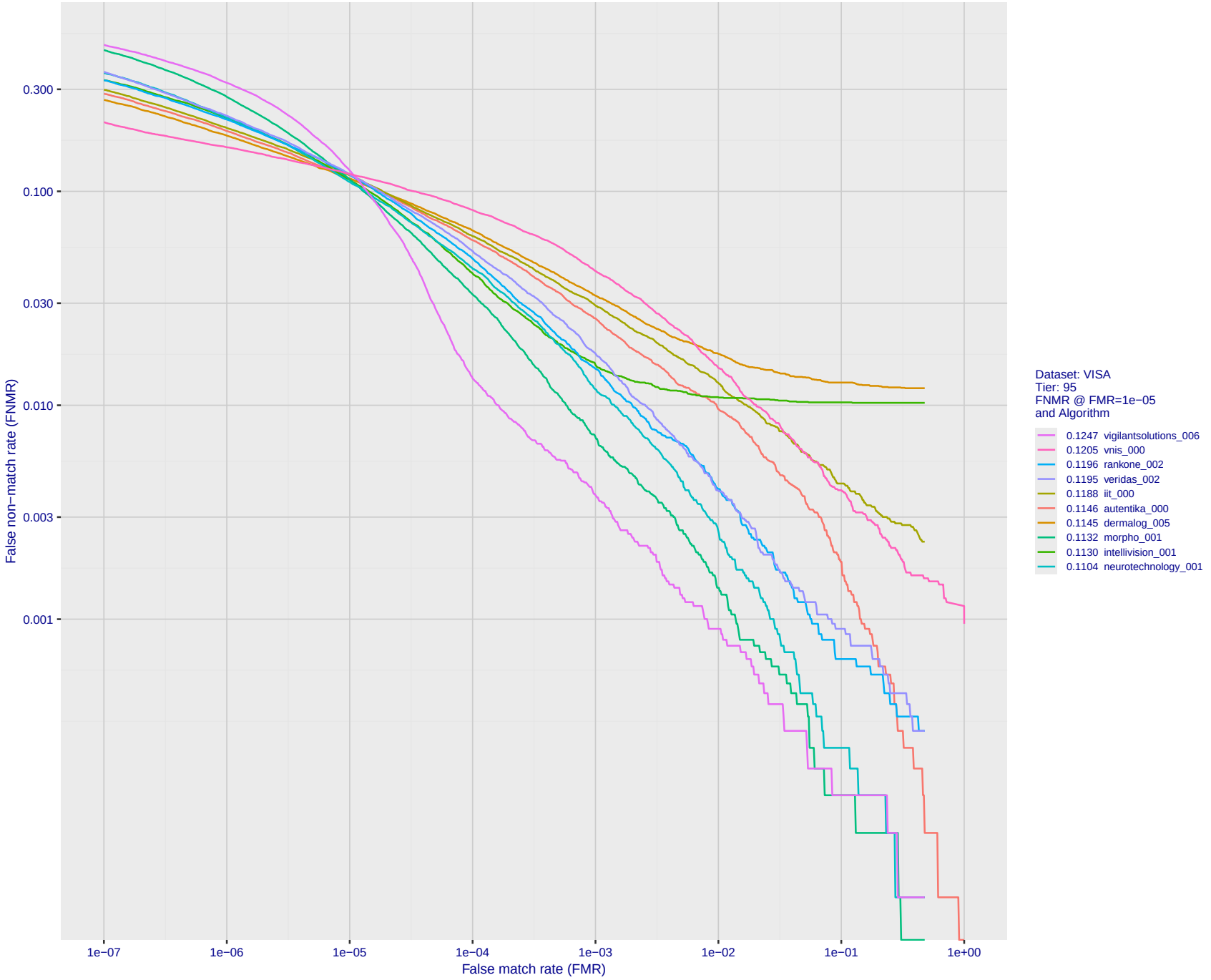

Figure 199: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

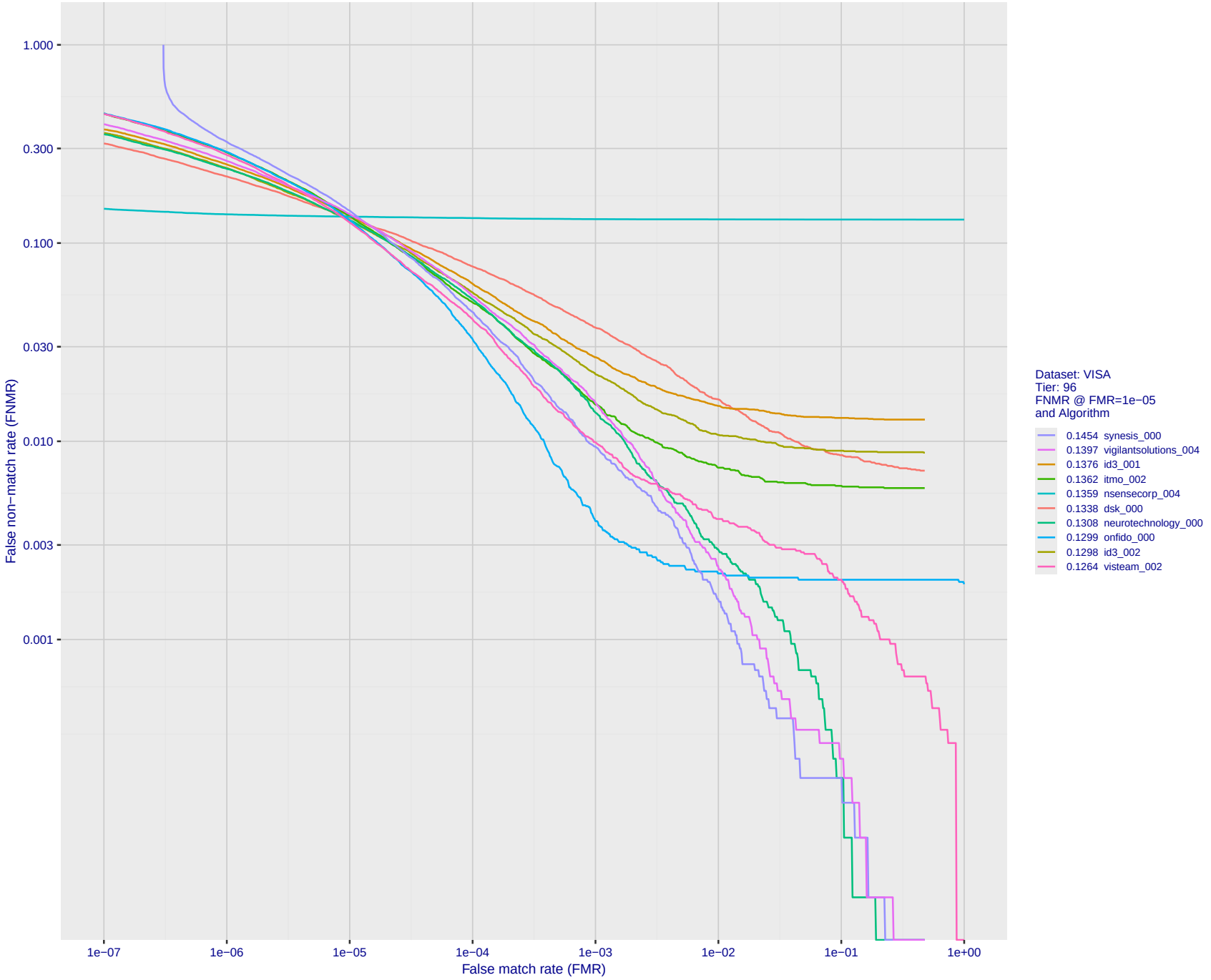

Figure 200: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

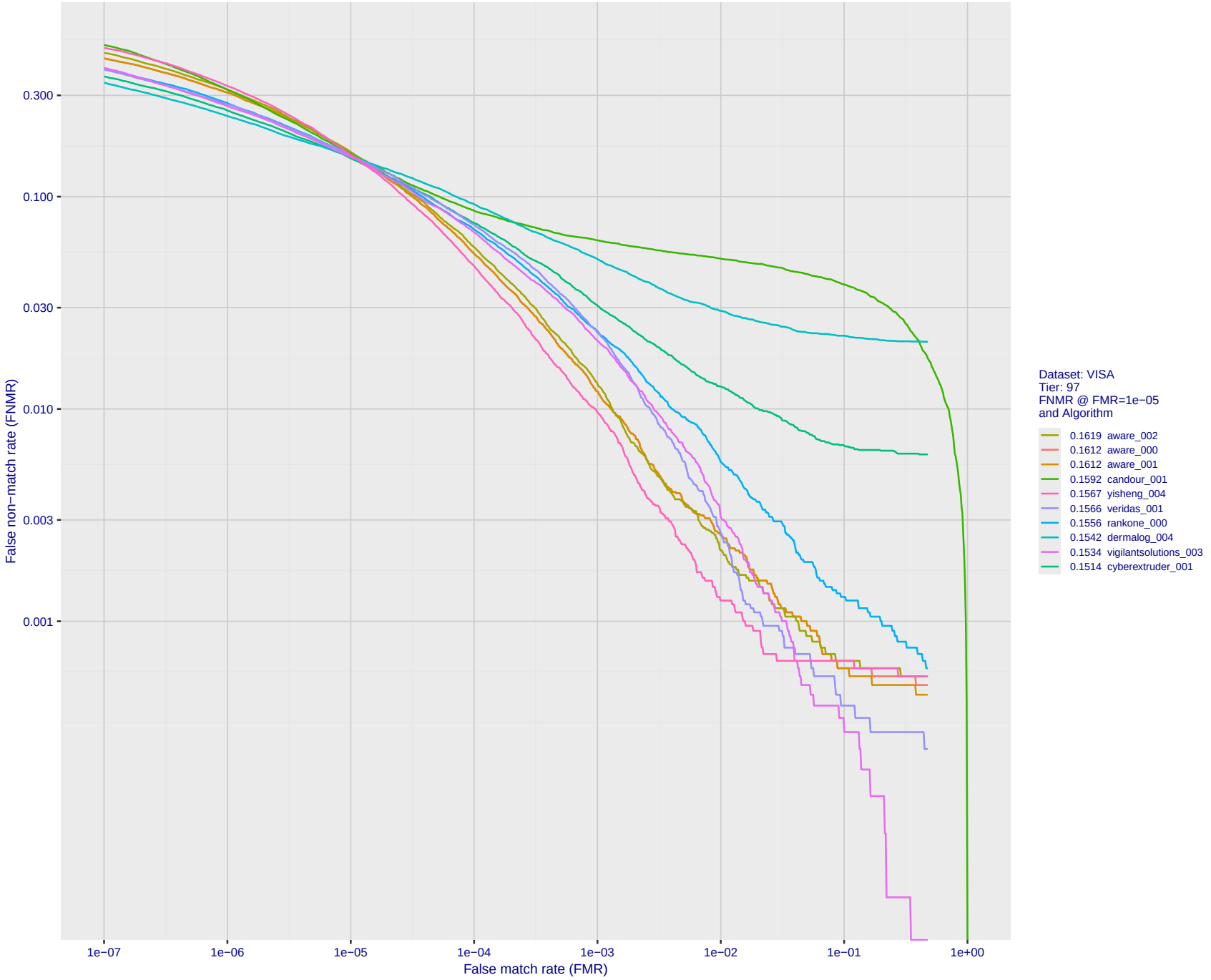

Figure 201: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

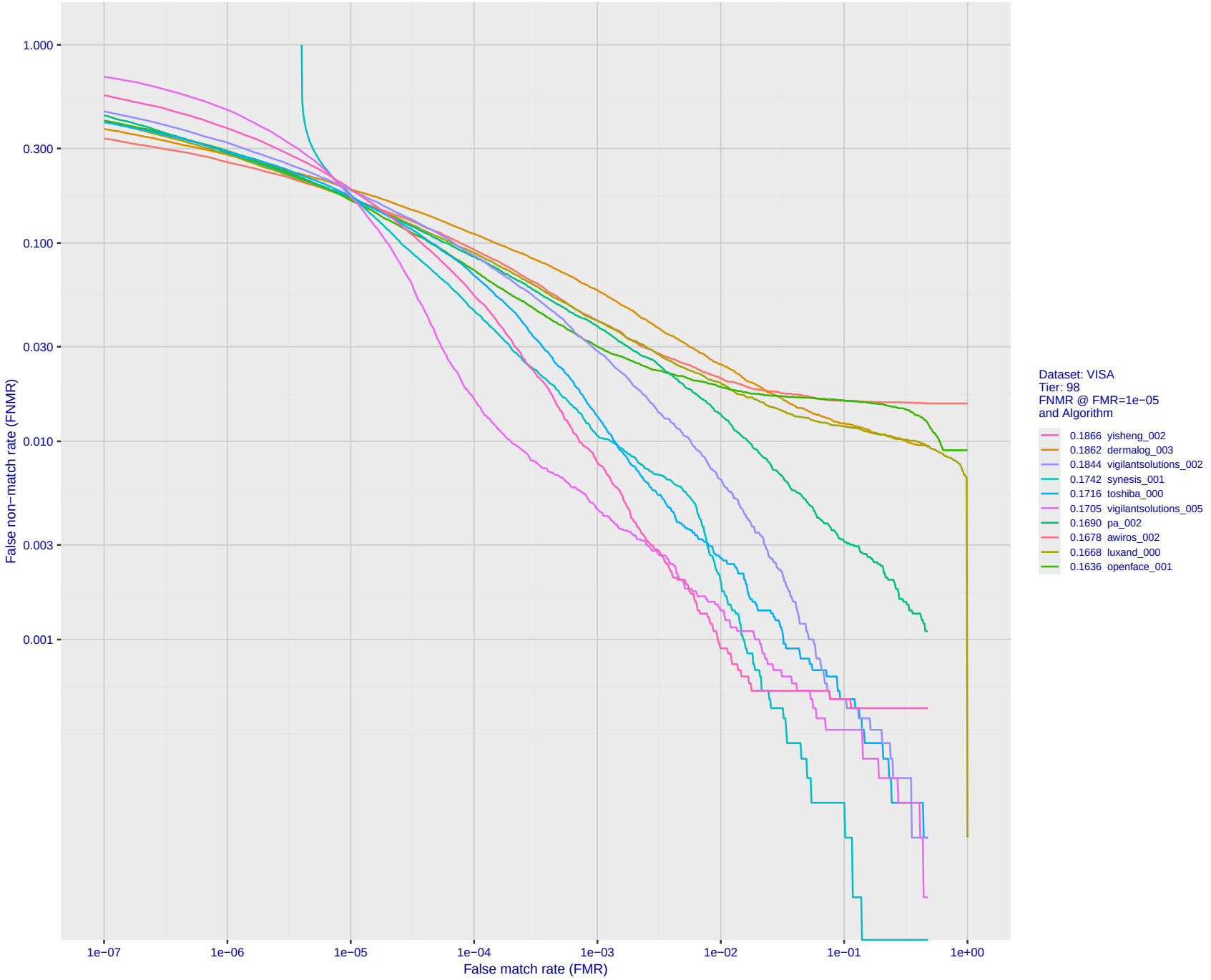

Figure 202: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

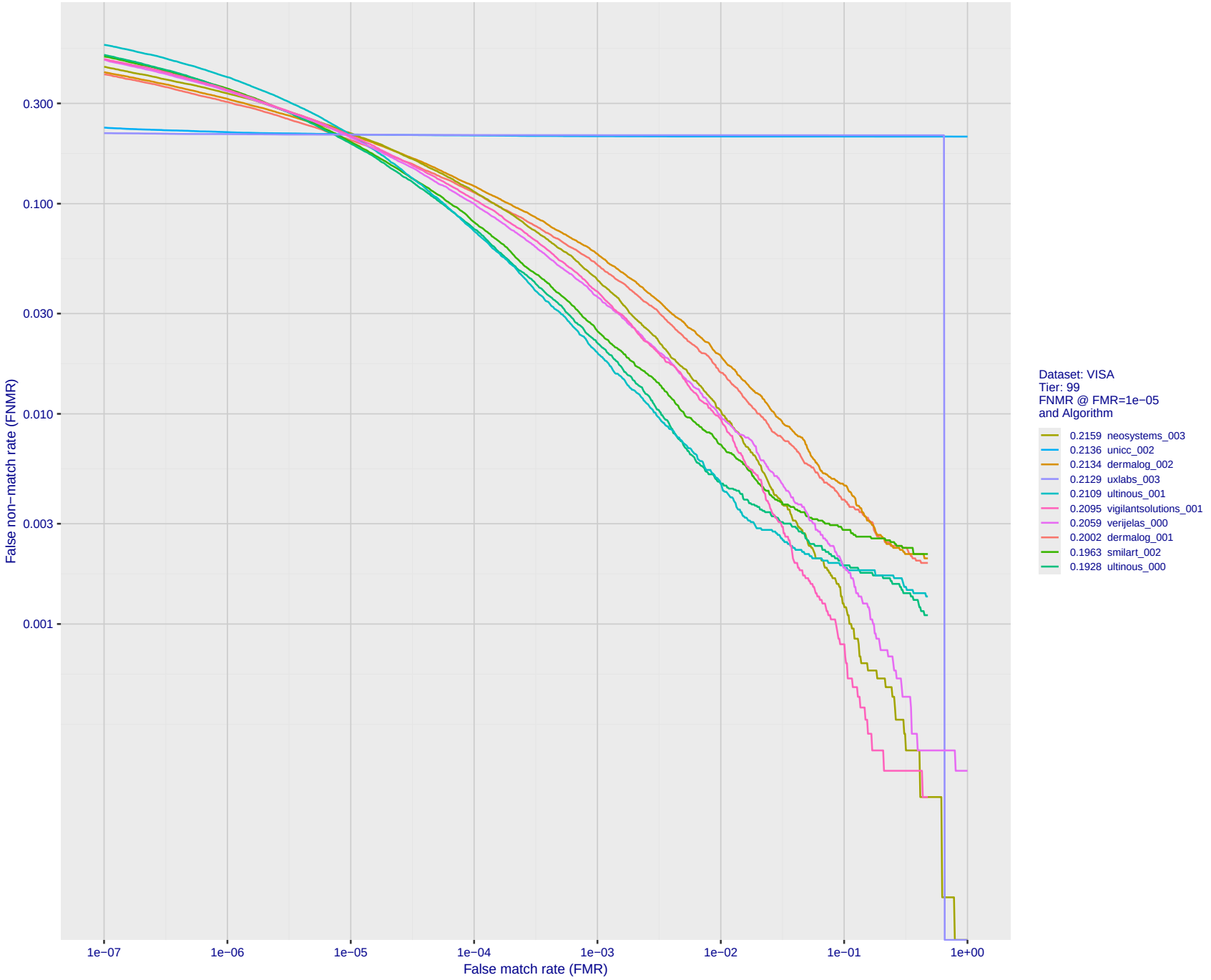

Figure 203: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

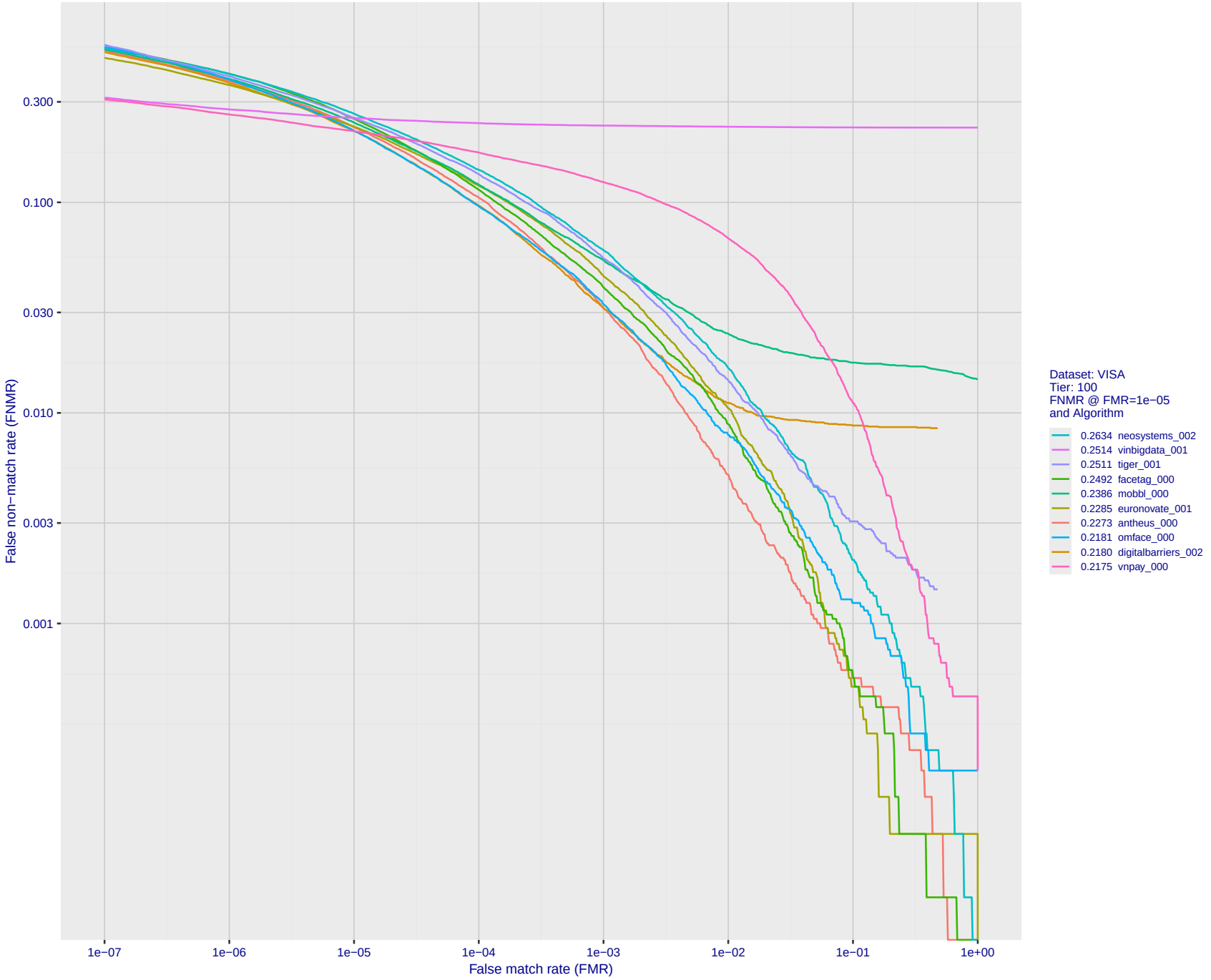

Figure 204: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

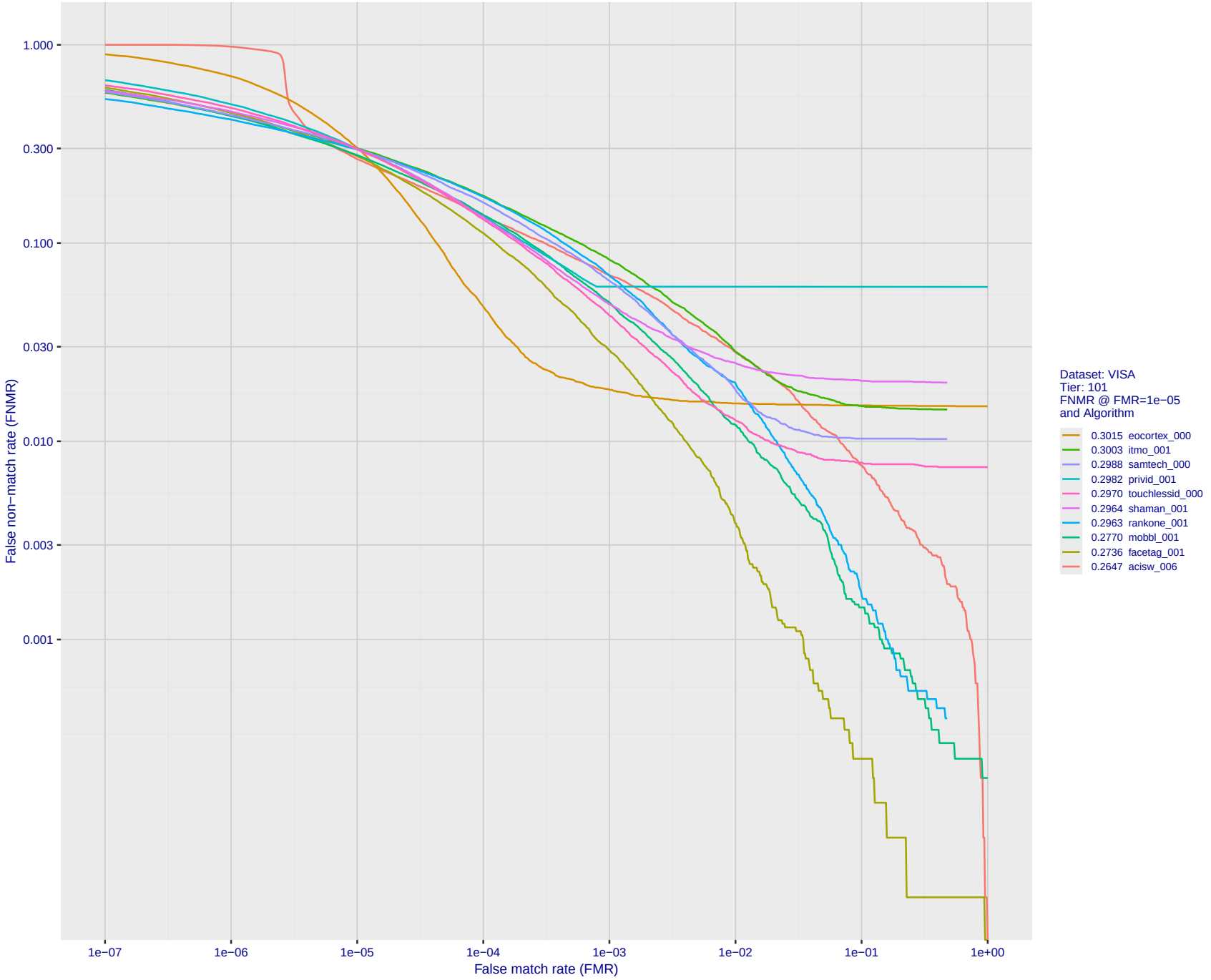

Figure 205: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

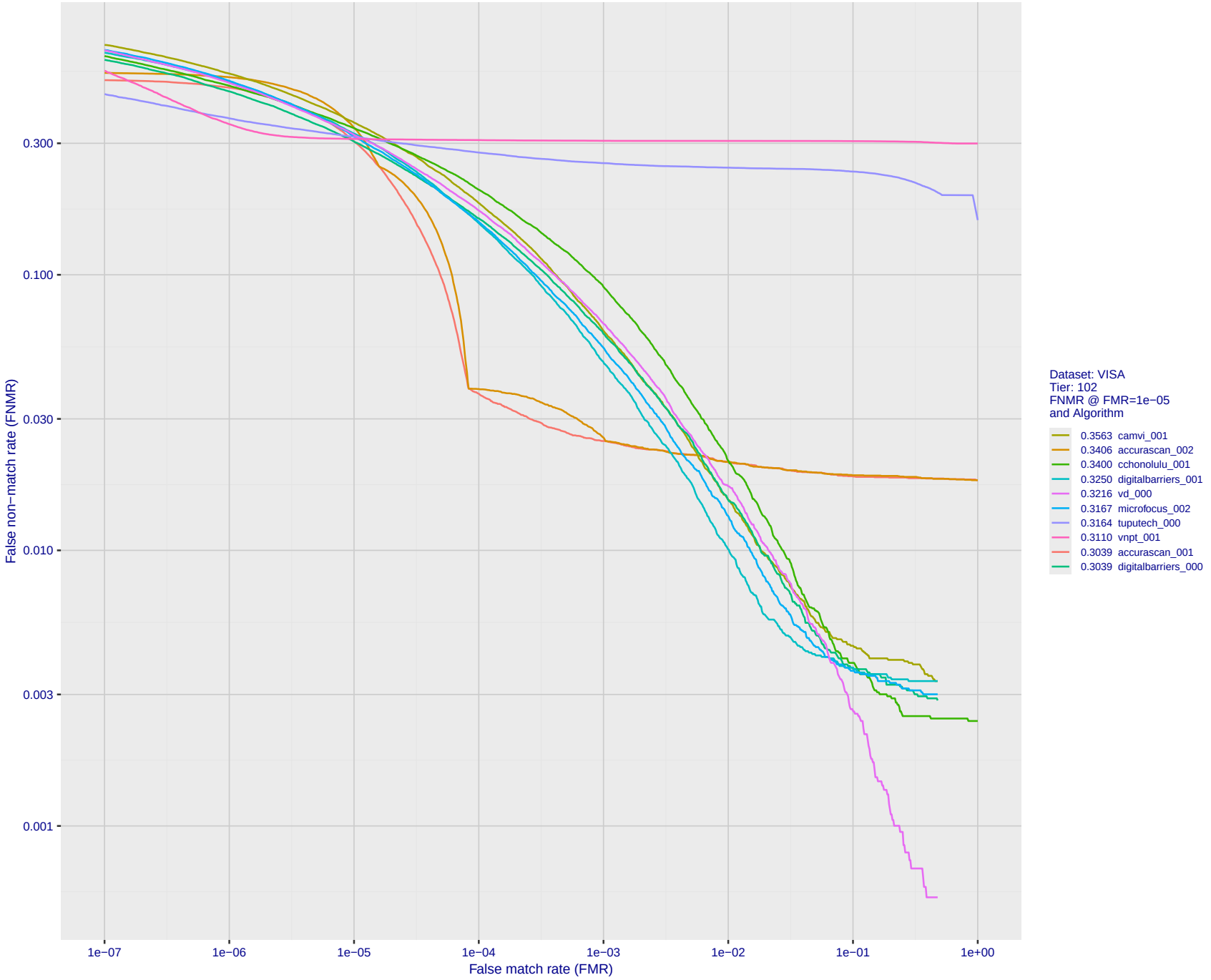

Figure 206: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

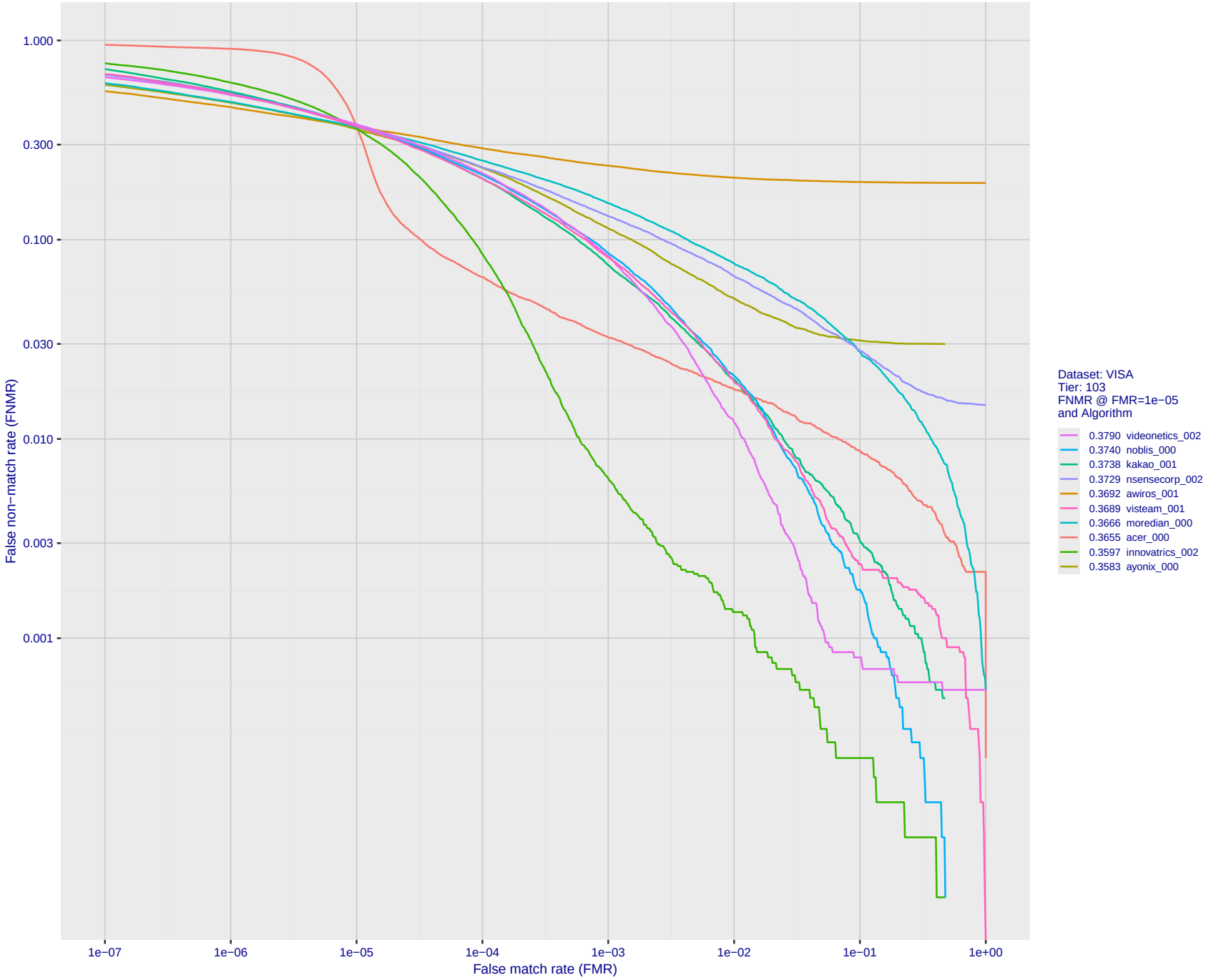

Figure 207: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

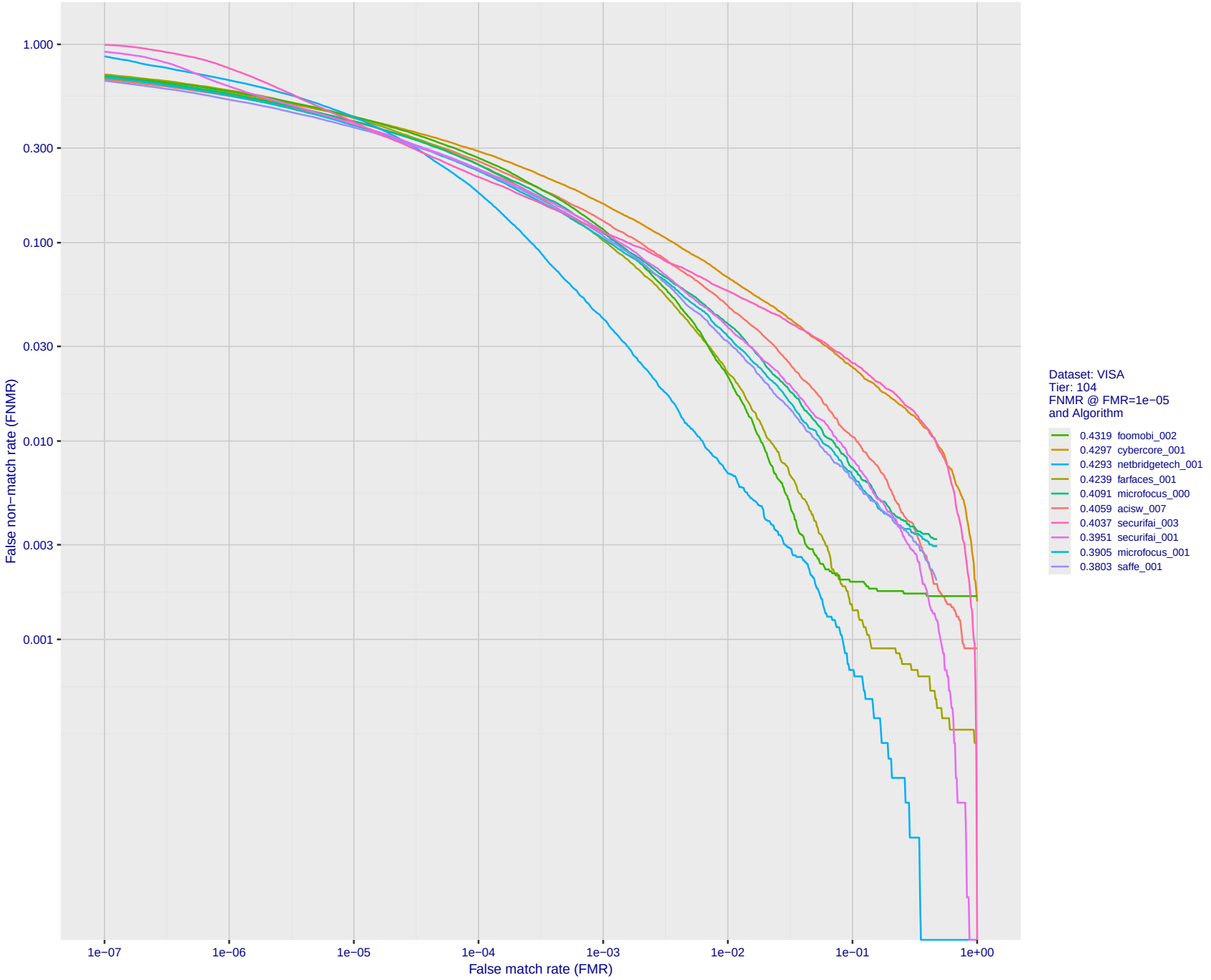

Figure 208: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

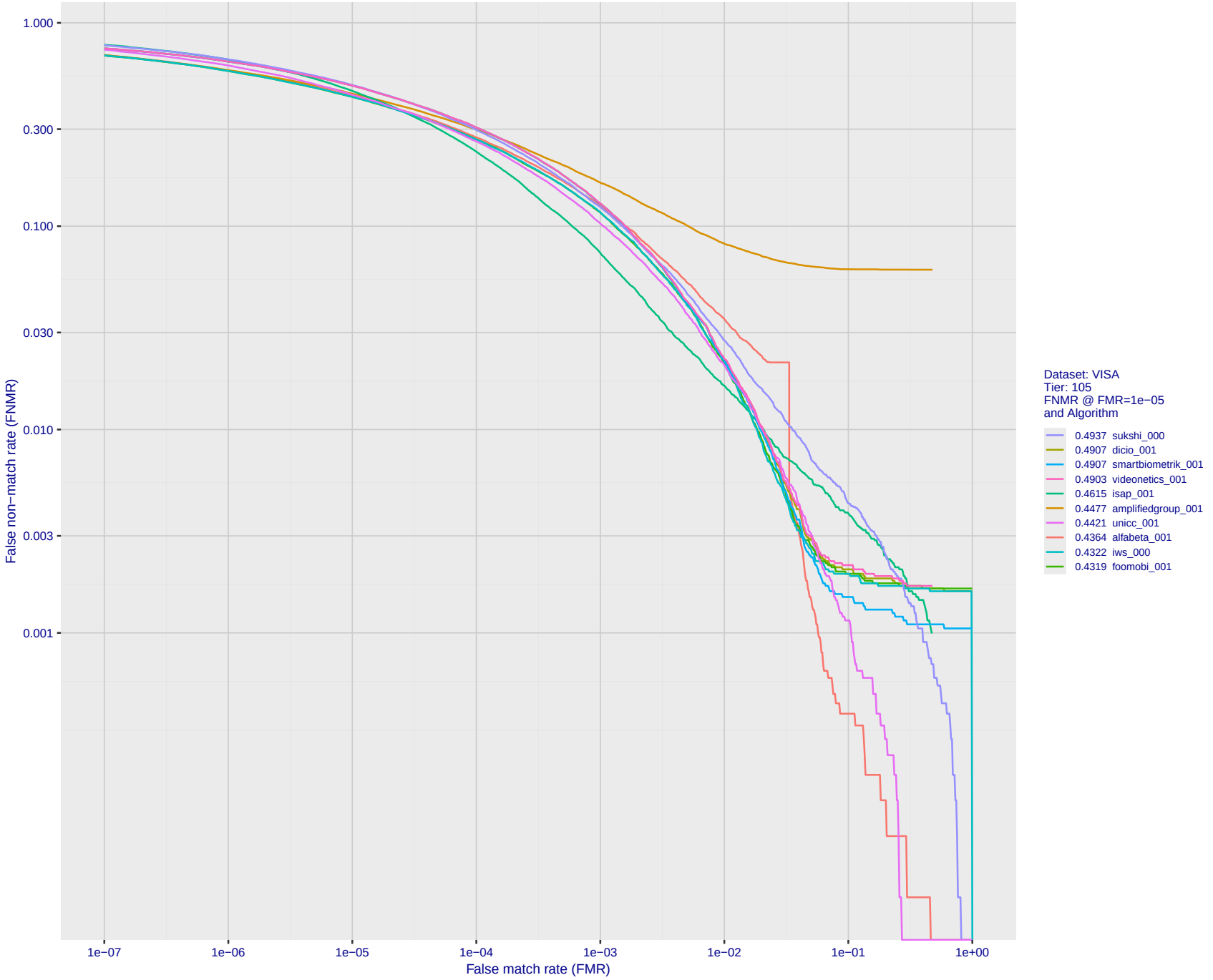

Figure 209: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

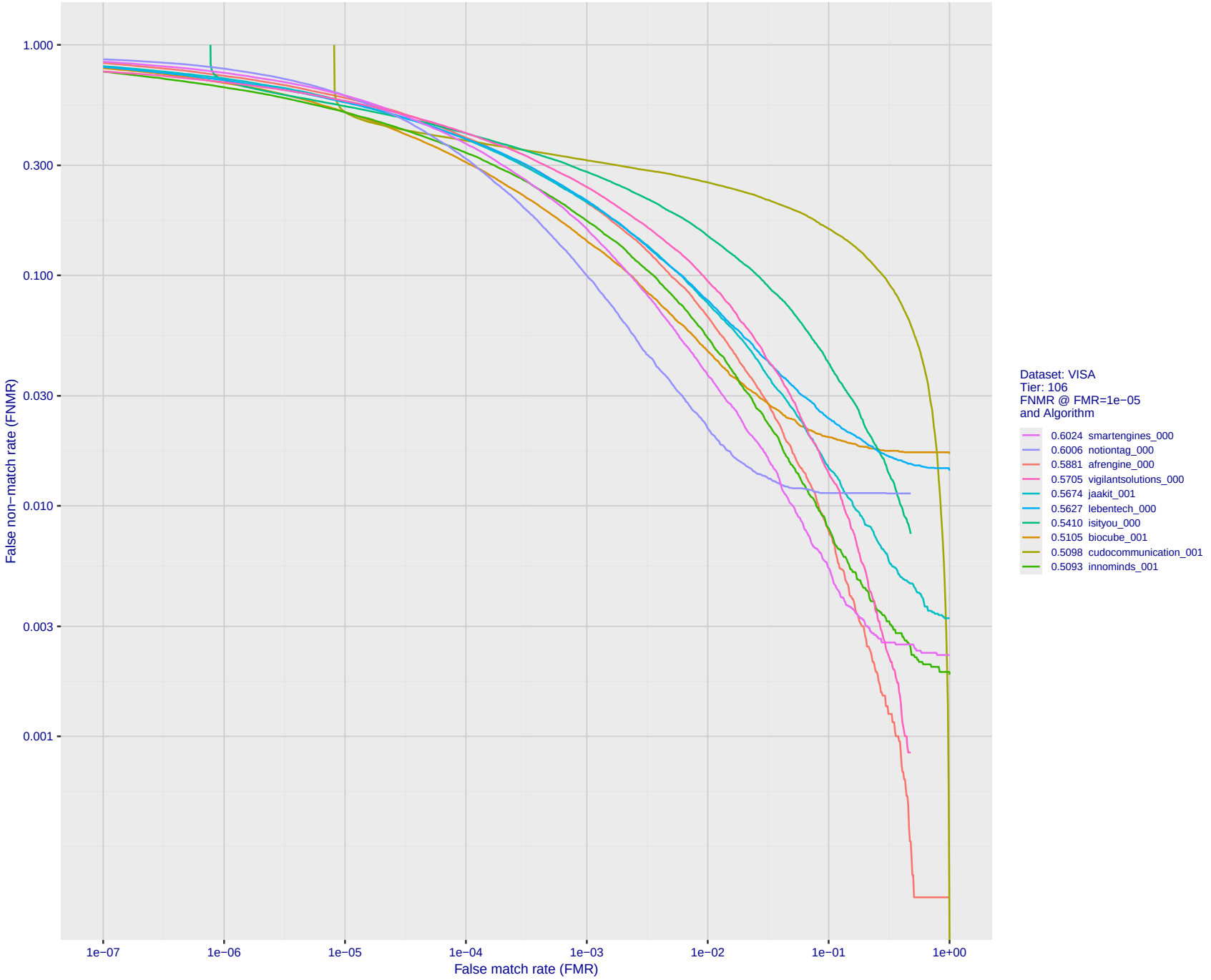

Figure 210: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

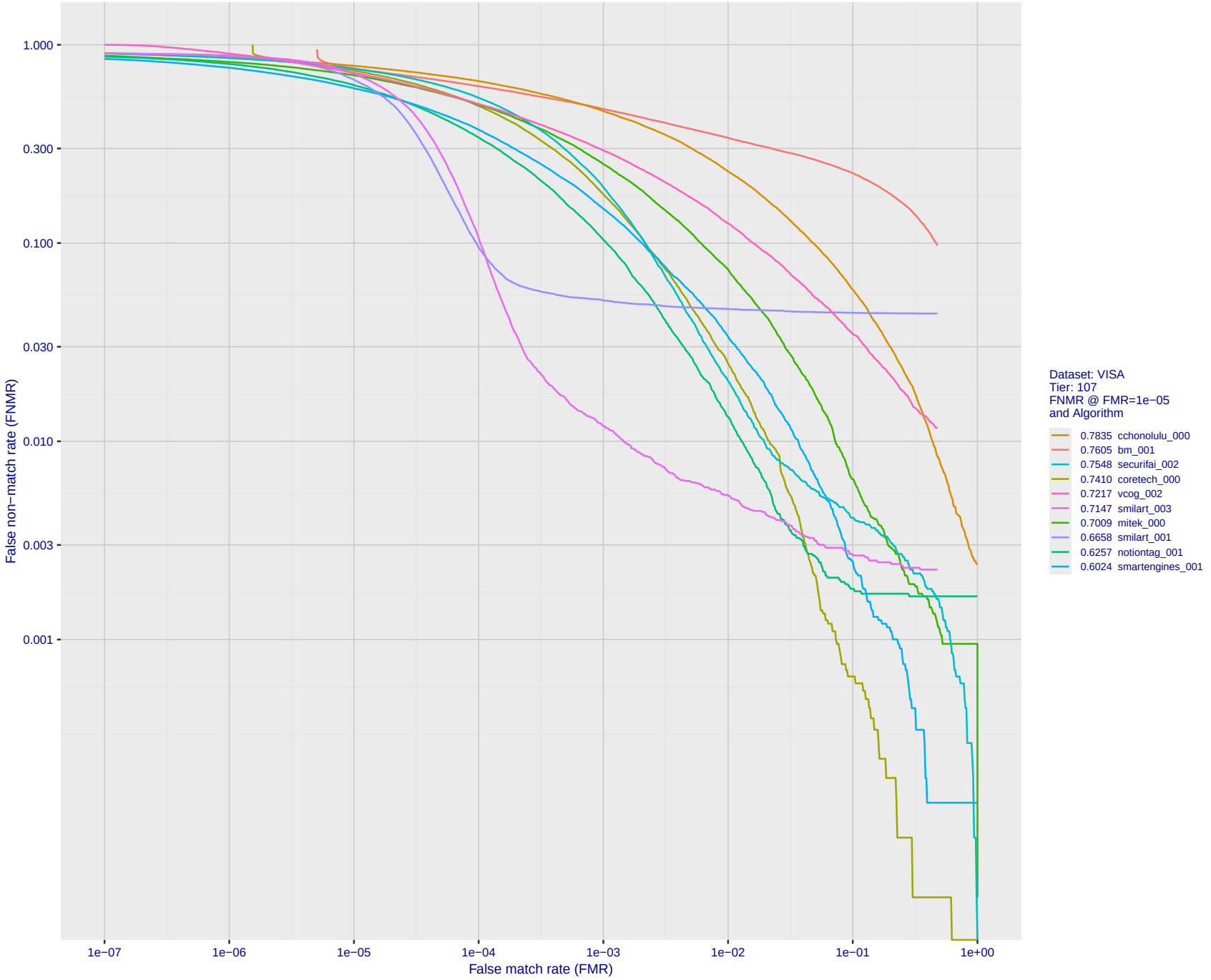

Figure 211: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

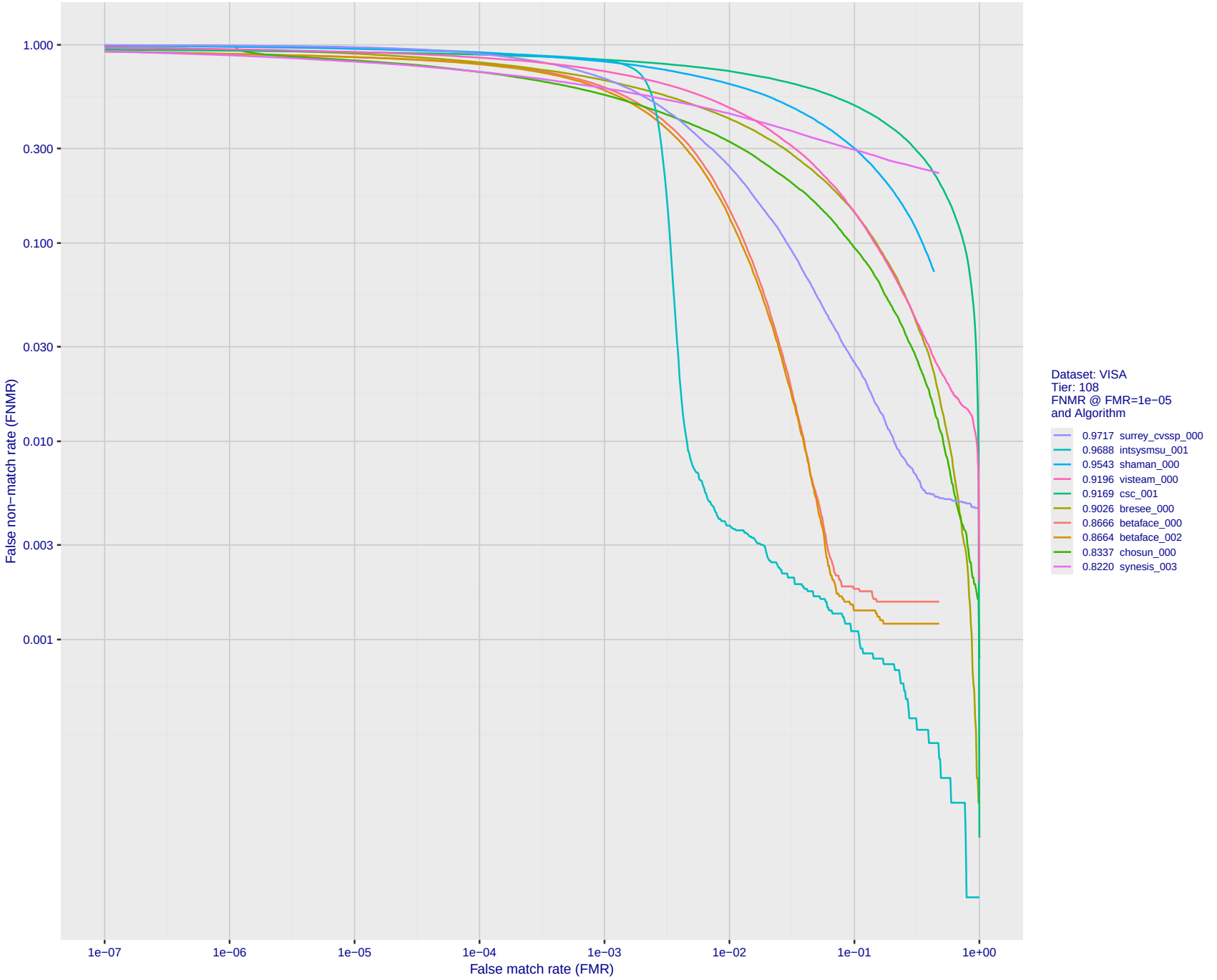

Figure 212: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

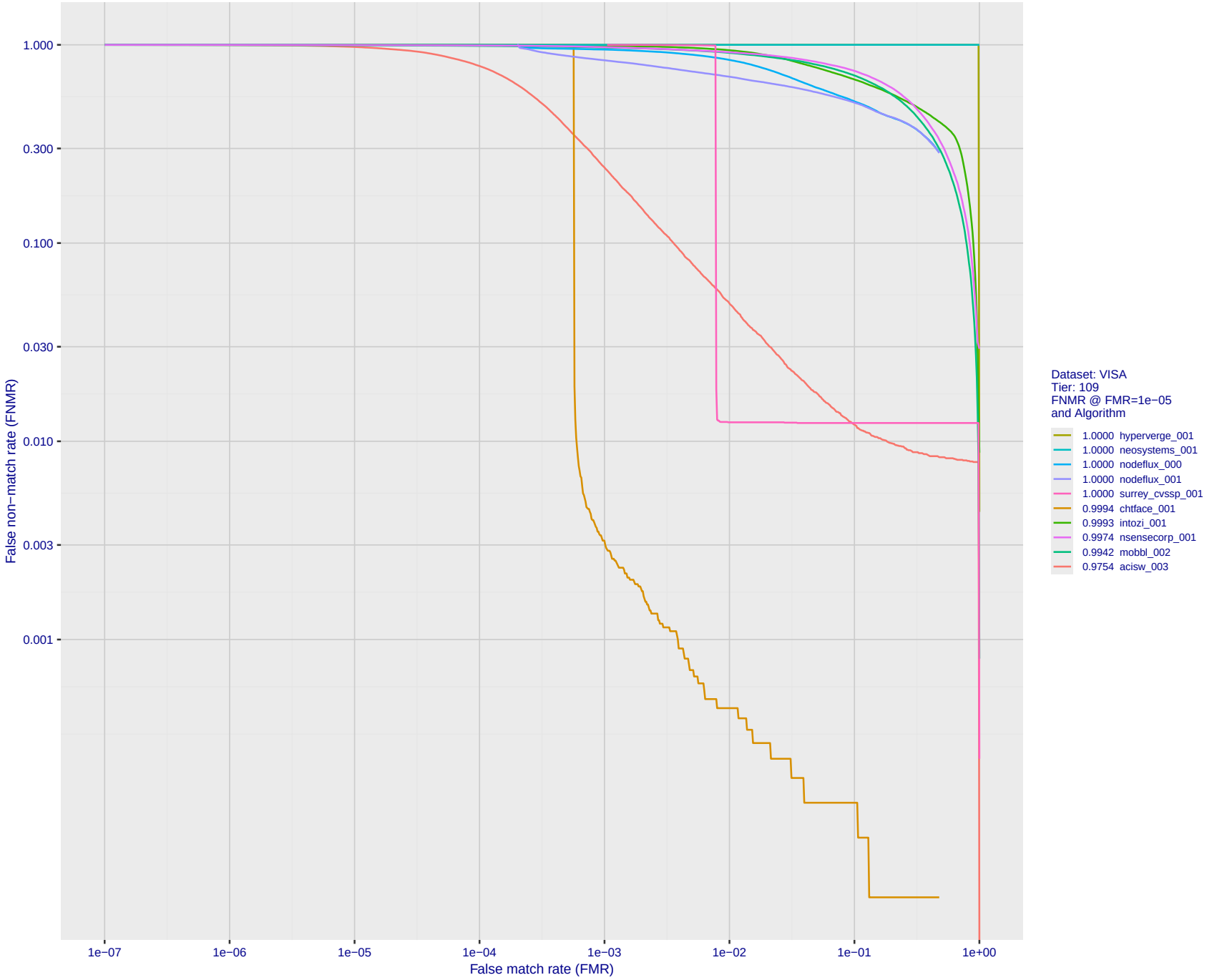

Figure 213: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

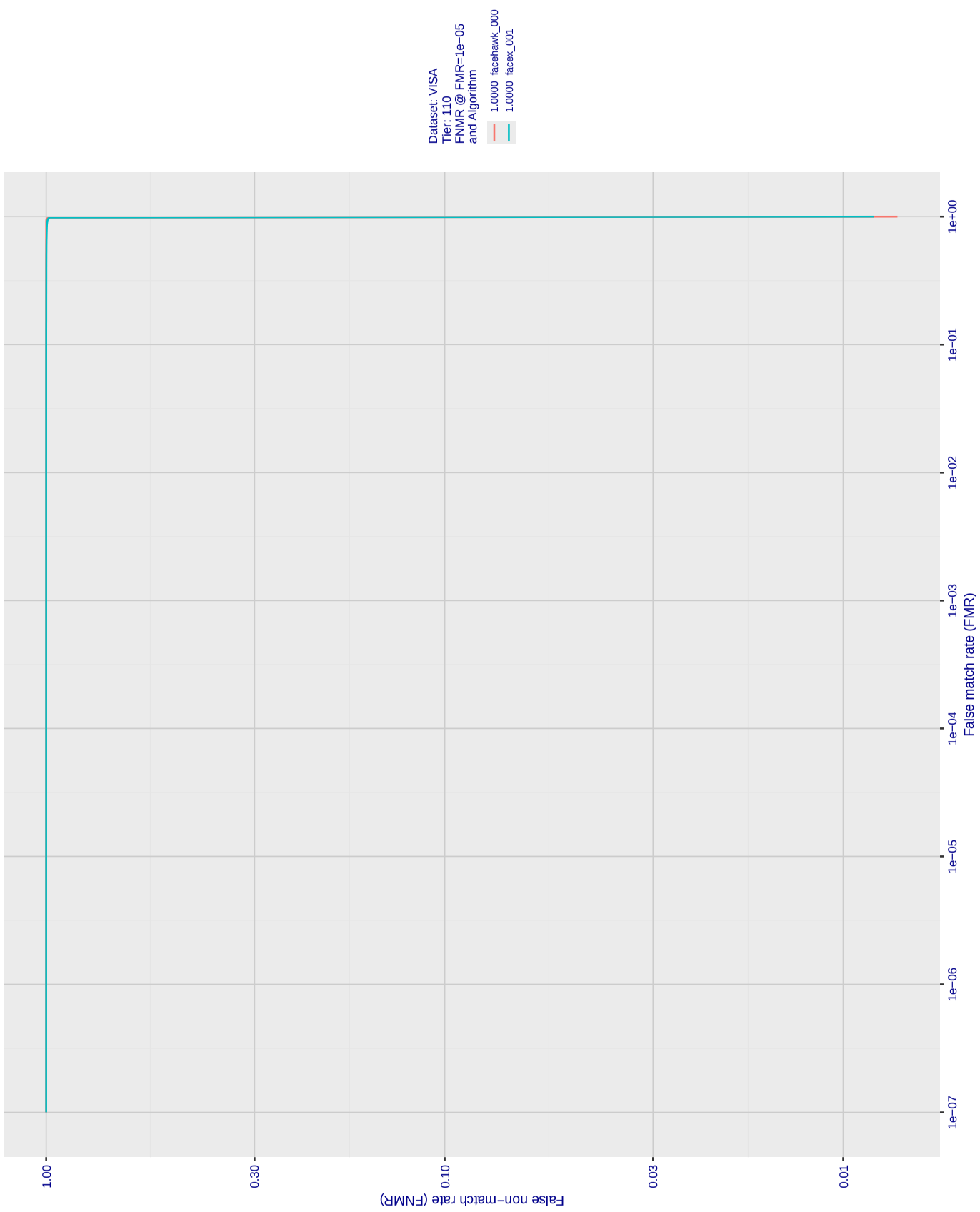

Figure 214: For the visa images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show many decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

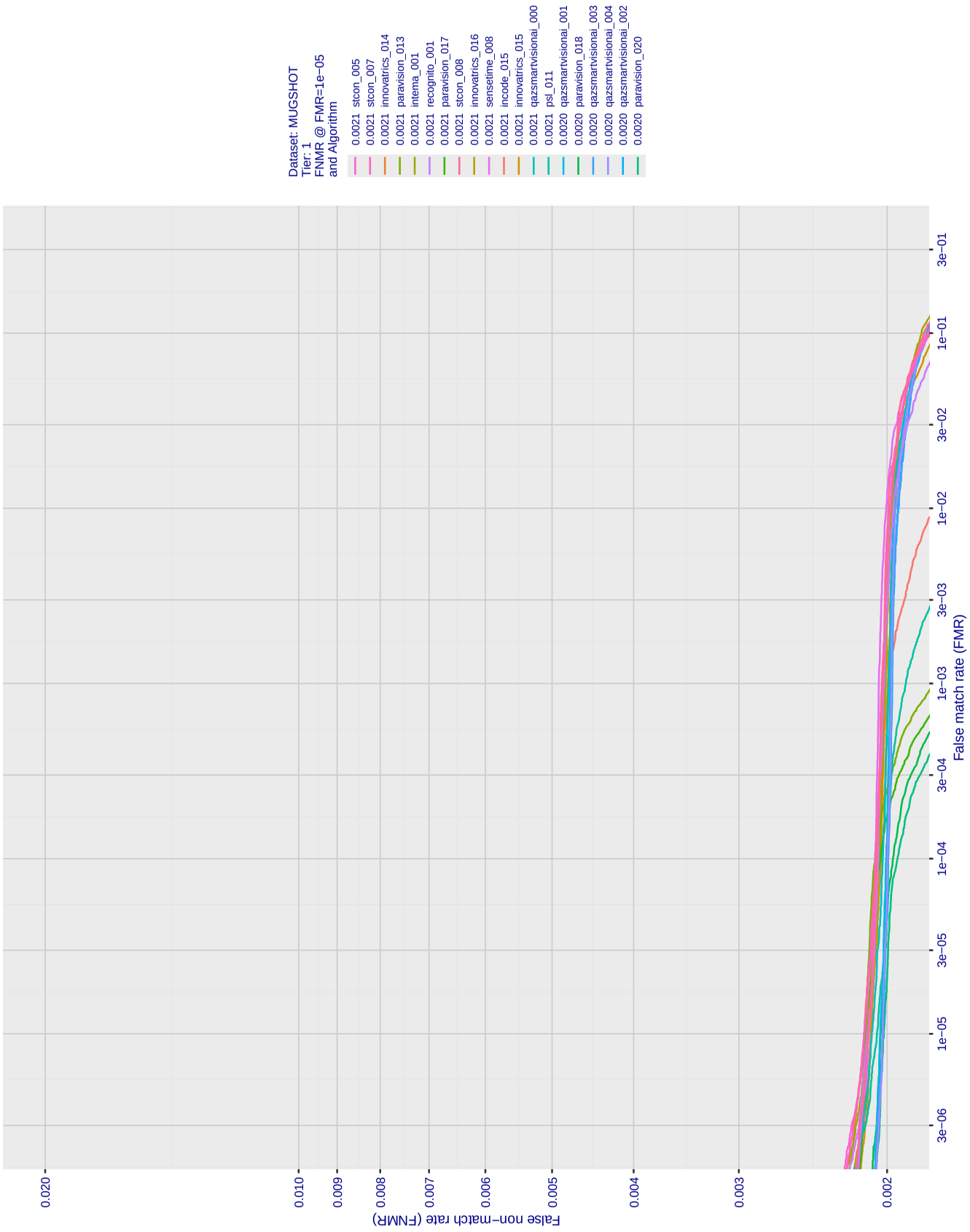

Figure 215: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

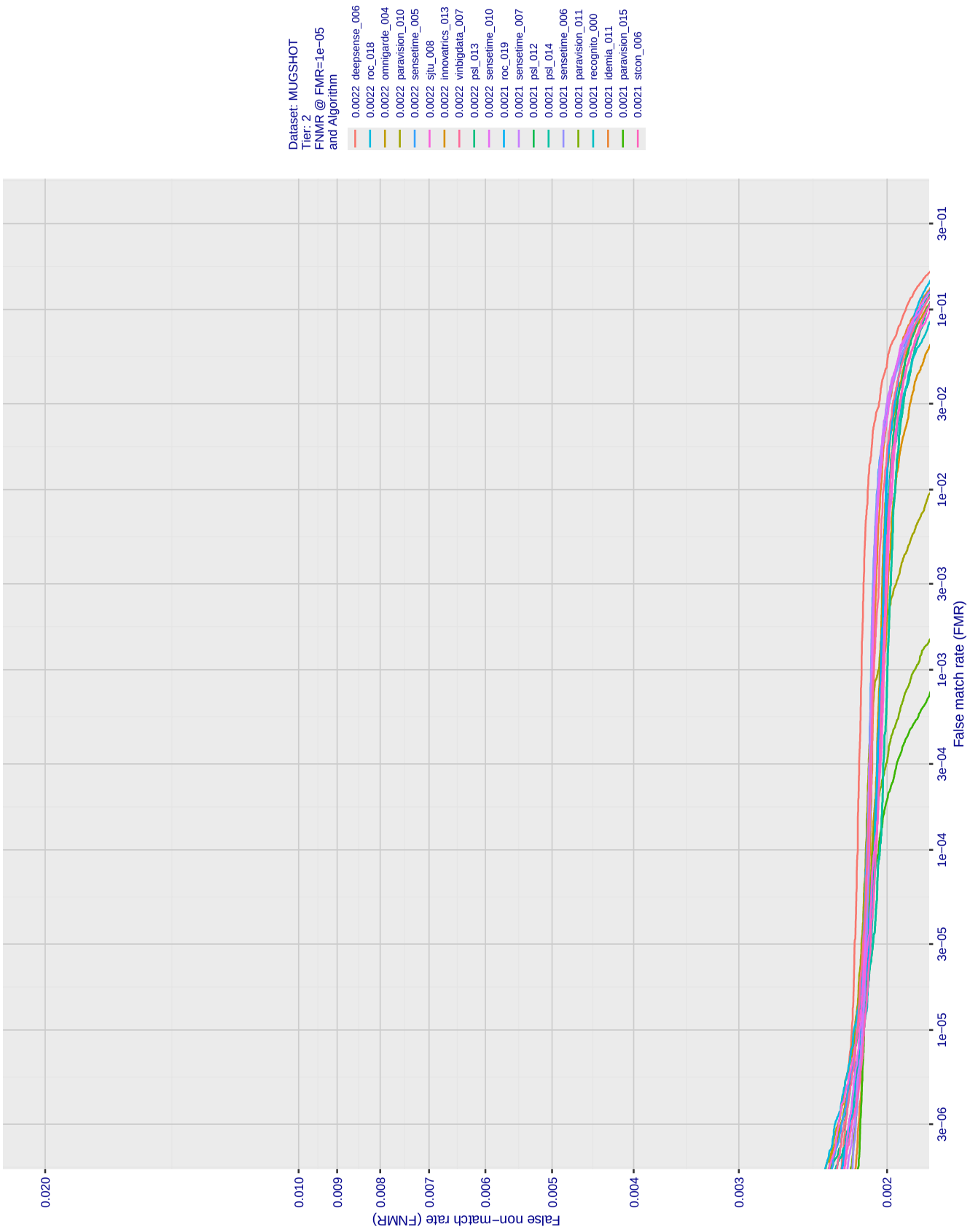

Figure 216: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

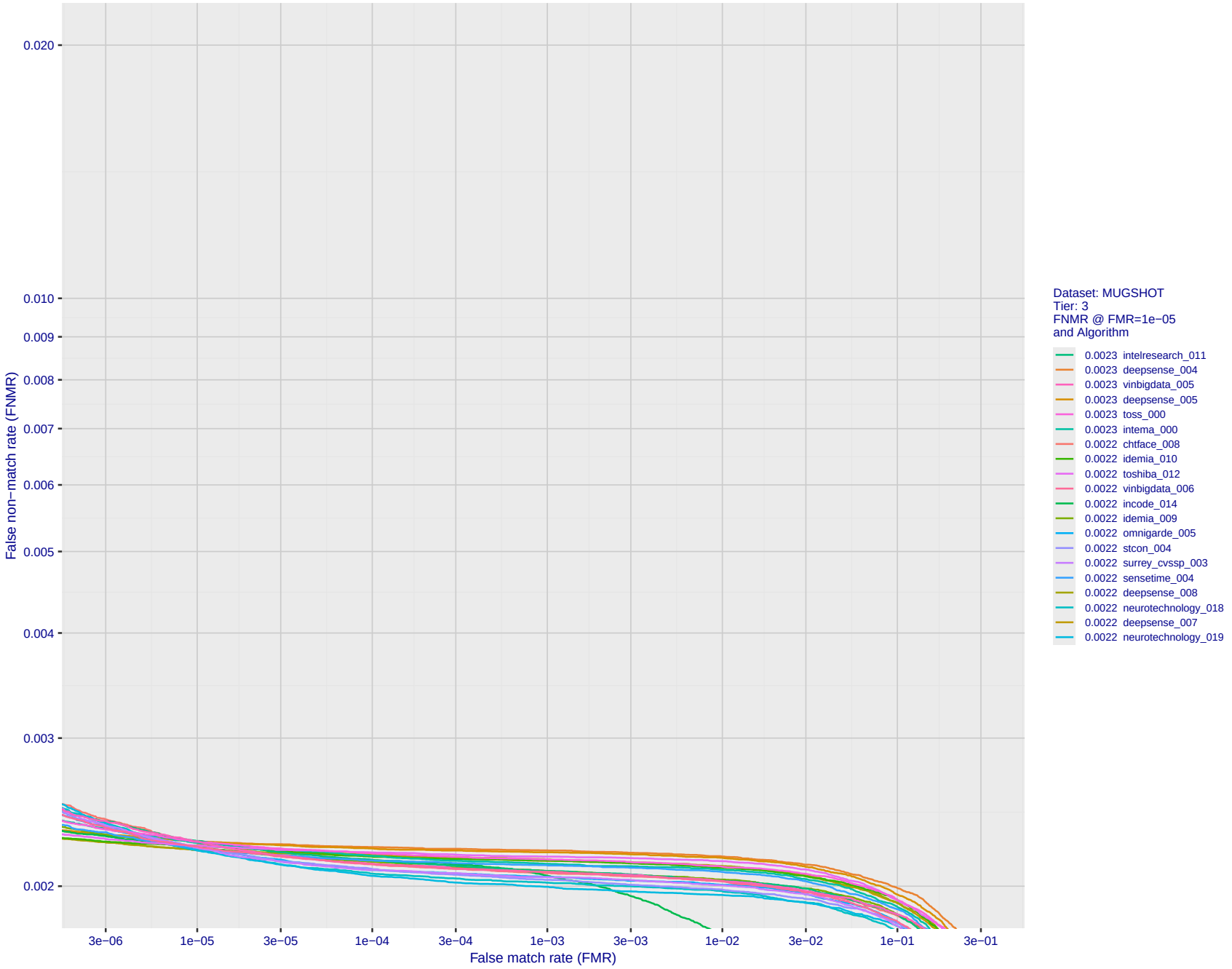

*Figure 217: For the mugshot images, detection error tradeoff (*DET*) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of* FMR*.*

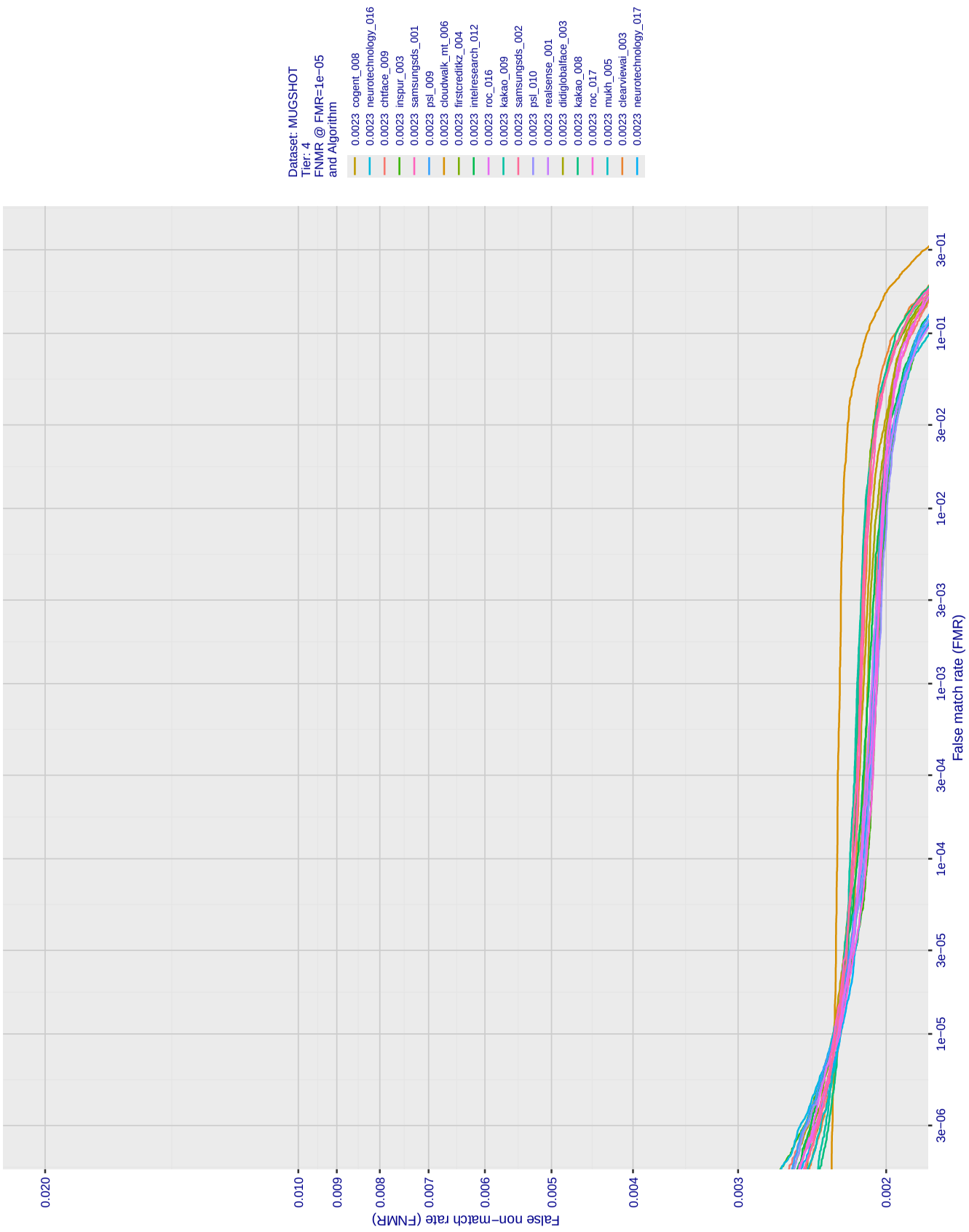

Figure 218: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

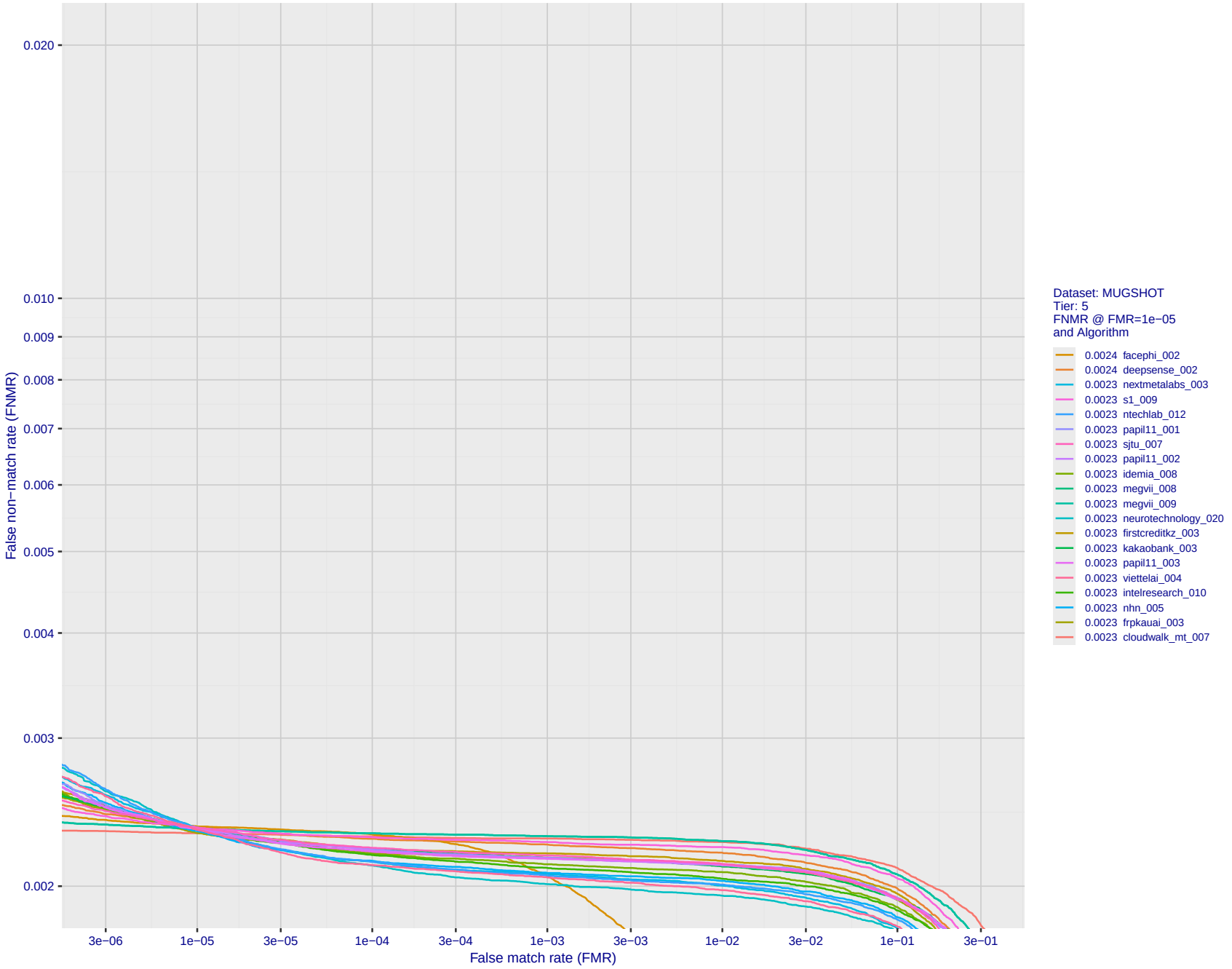

Figure 219: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

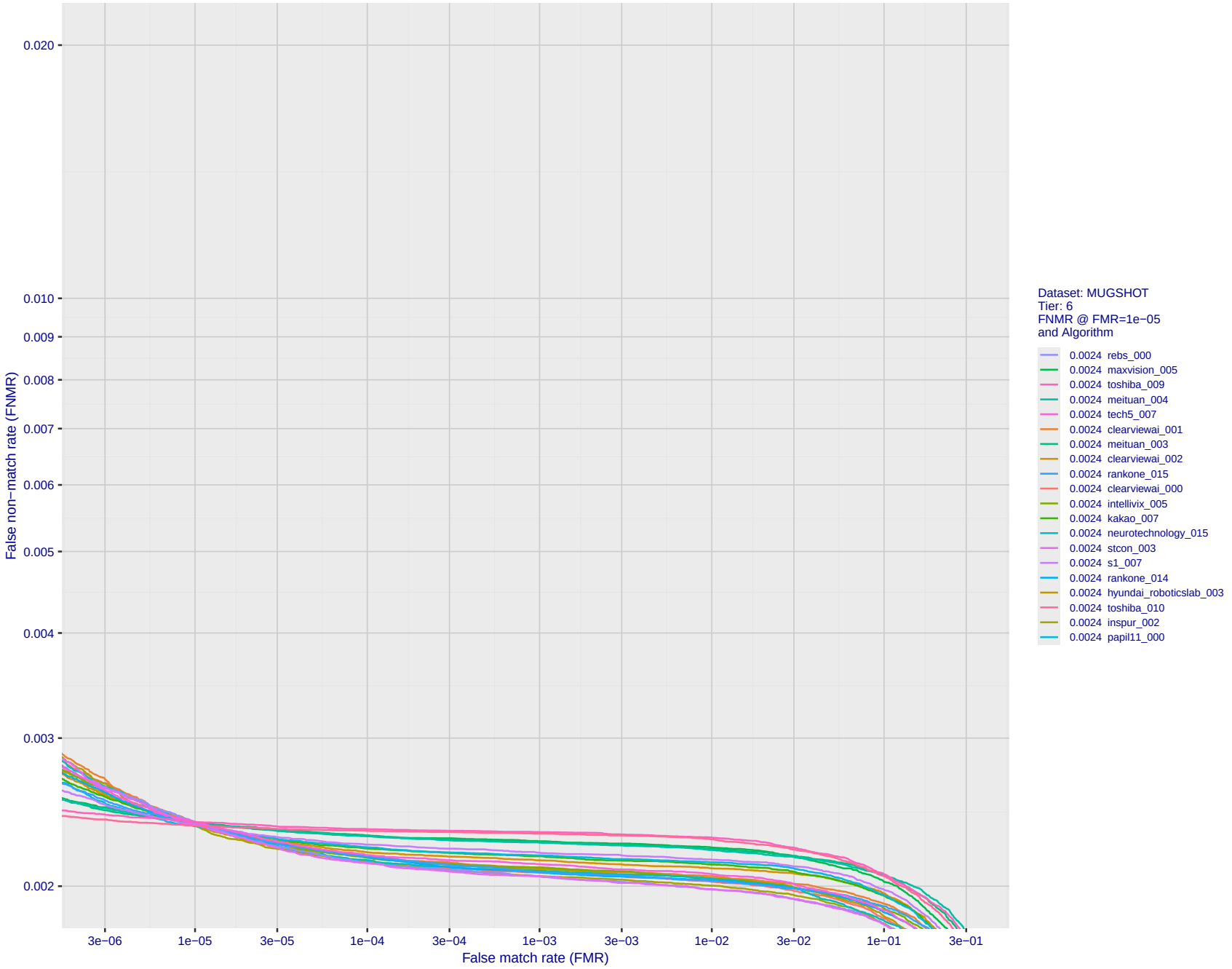

*Figure 220: For the mugshot images, detection error tradeoff (*DET*) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of* FMR*.*

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

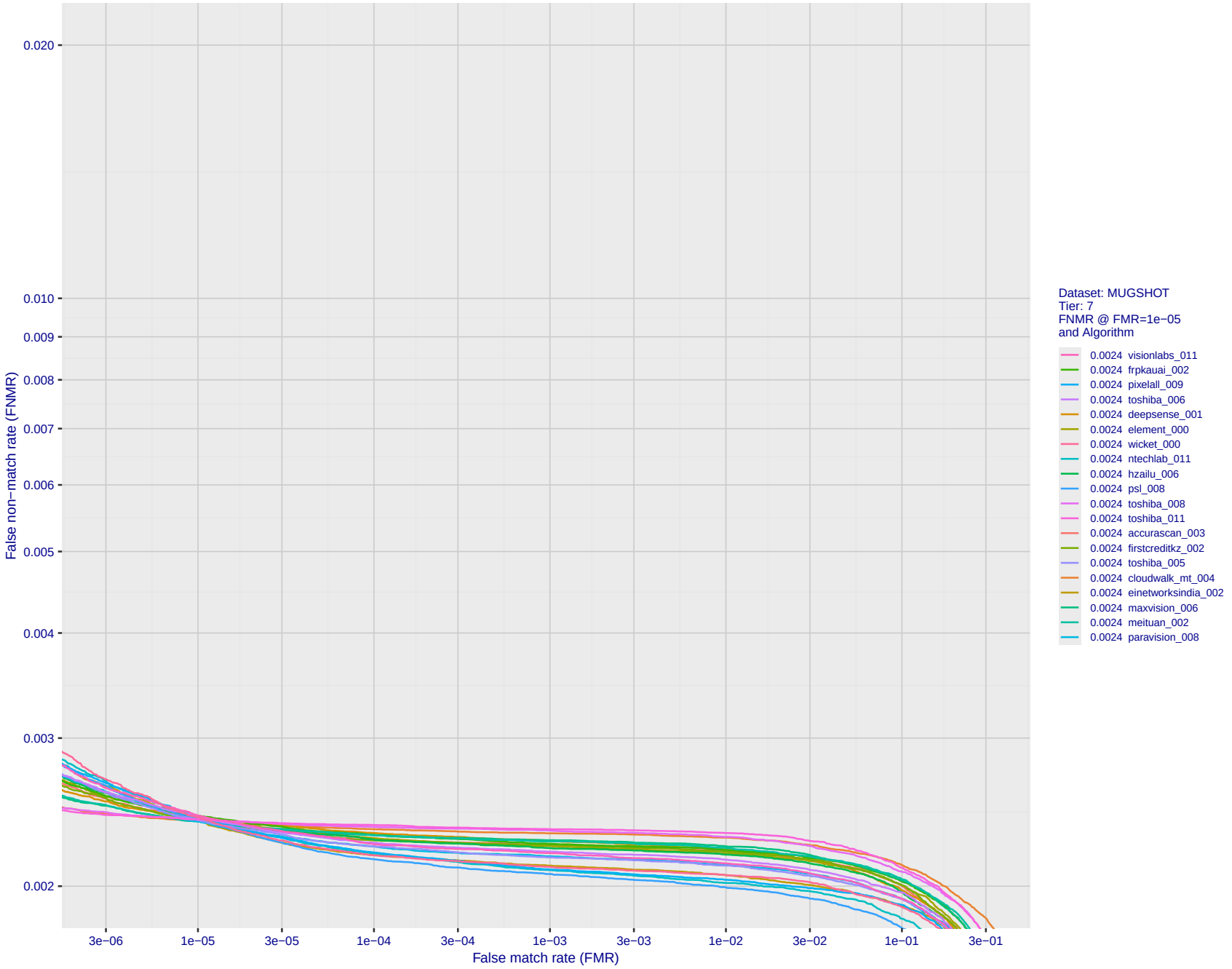

Figure 221: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

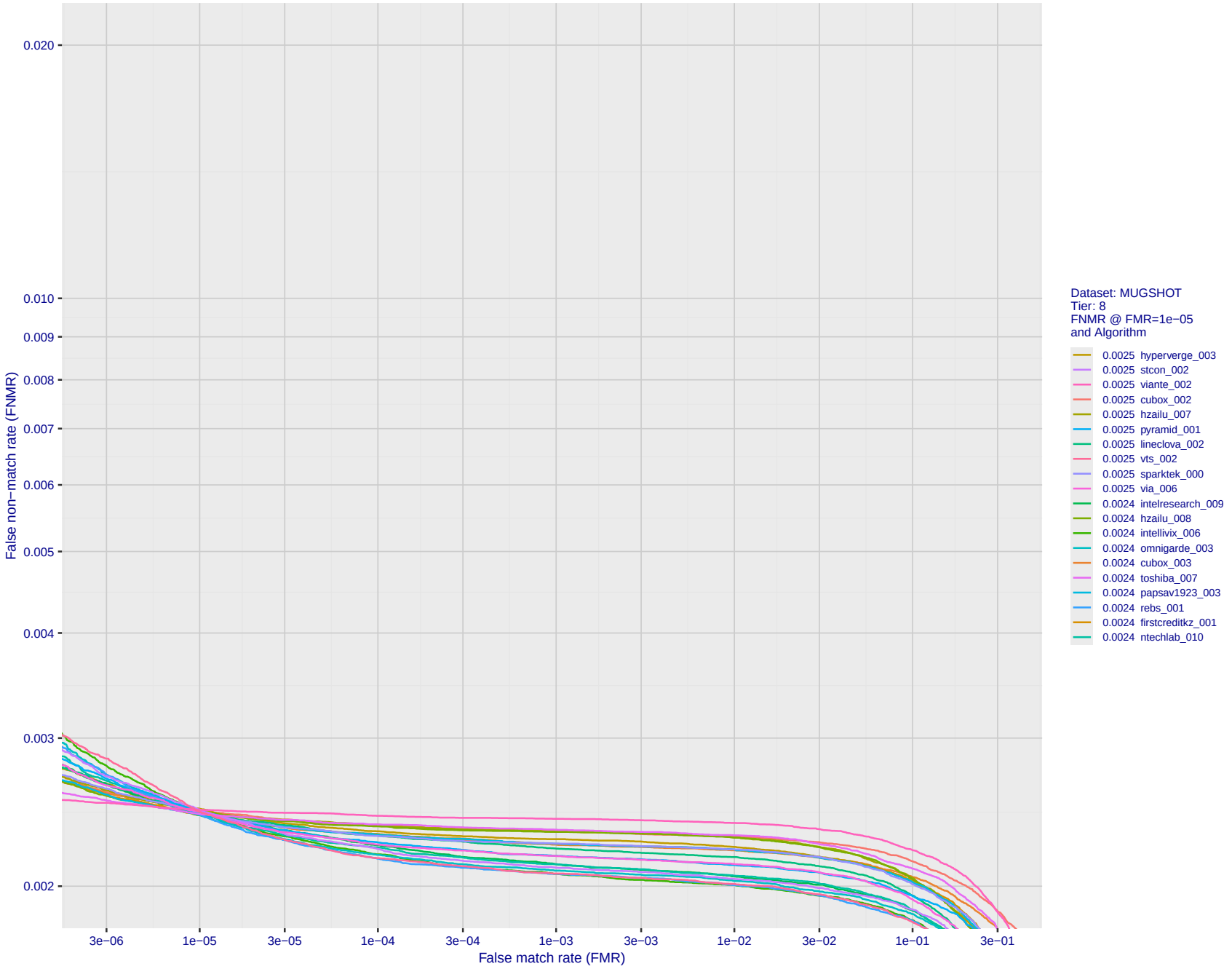

Figure 222: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

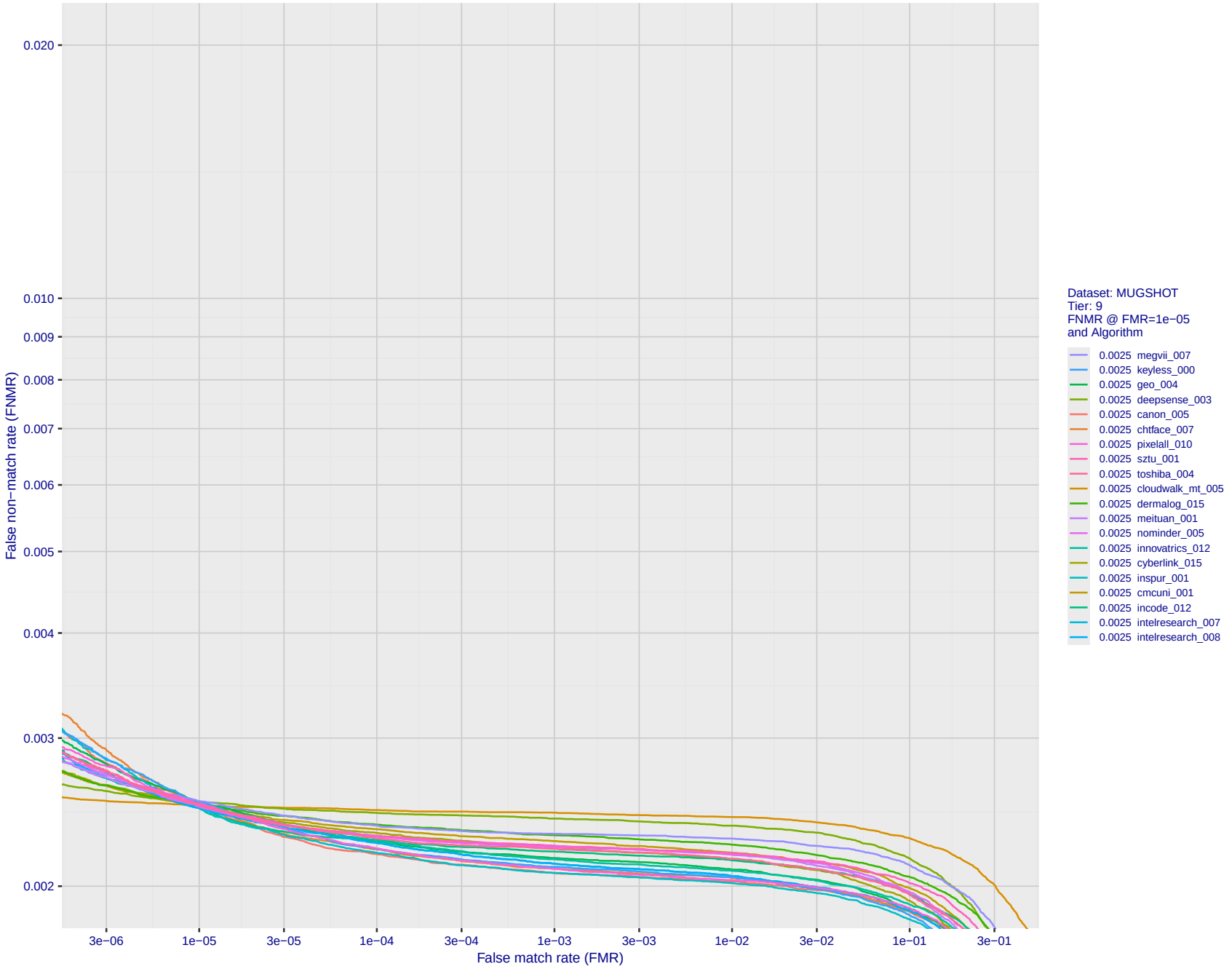

Figure 223: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

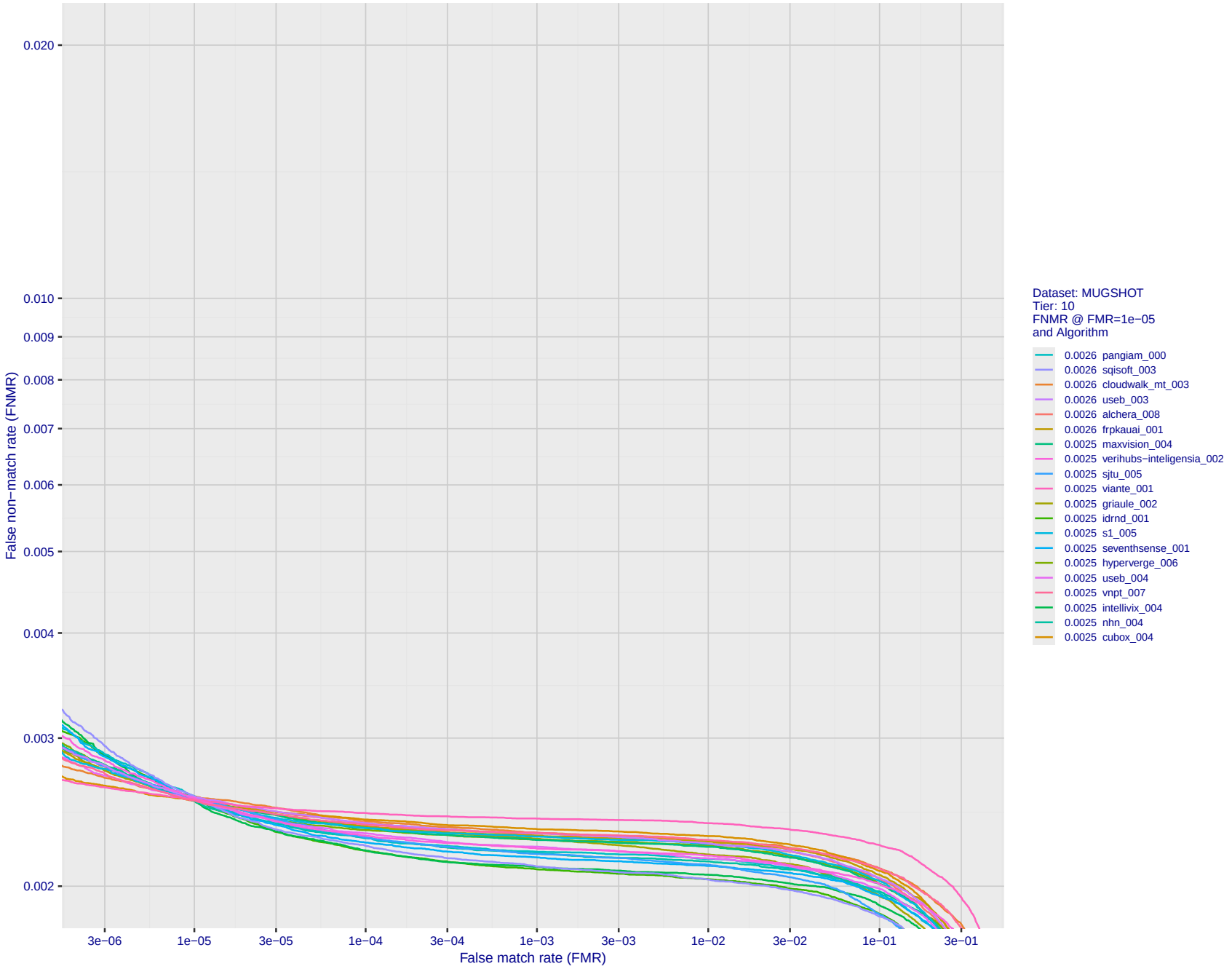

Figure 224: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

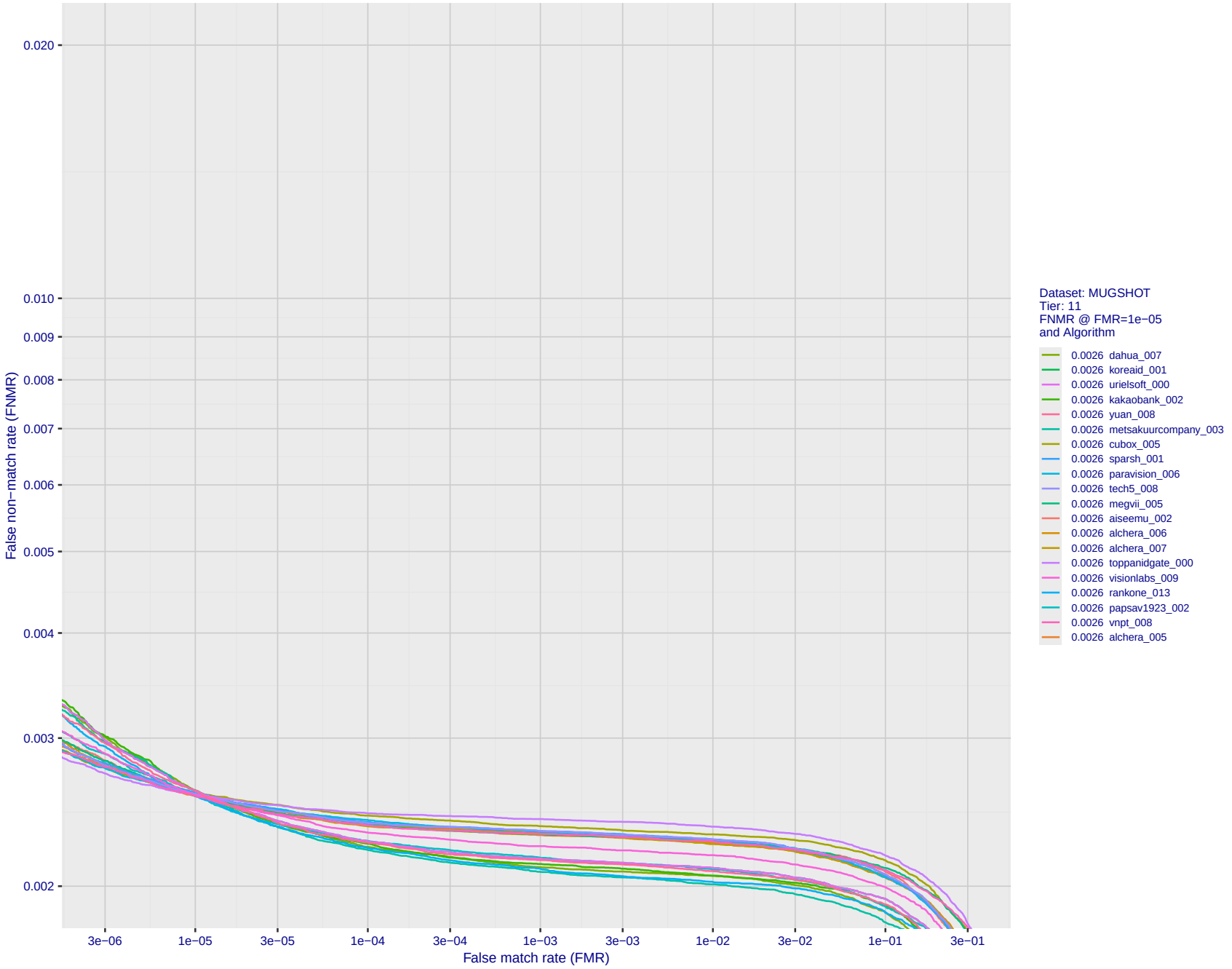

Figure 225: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

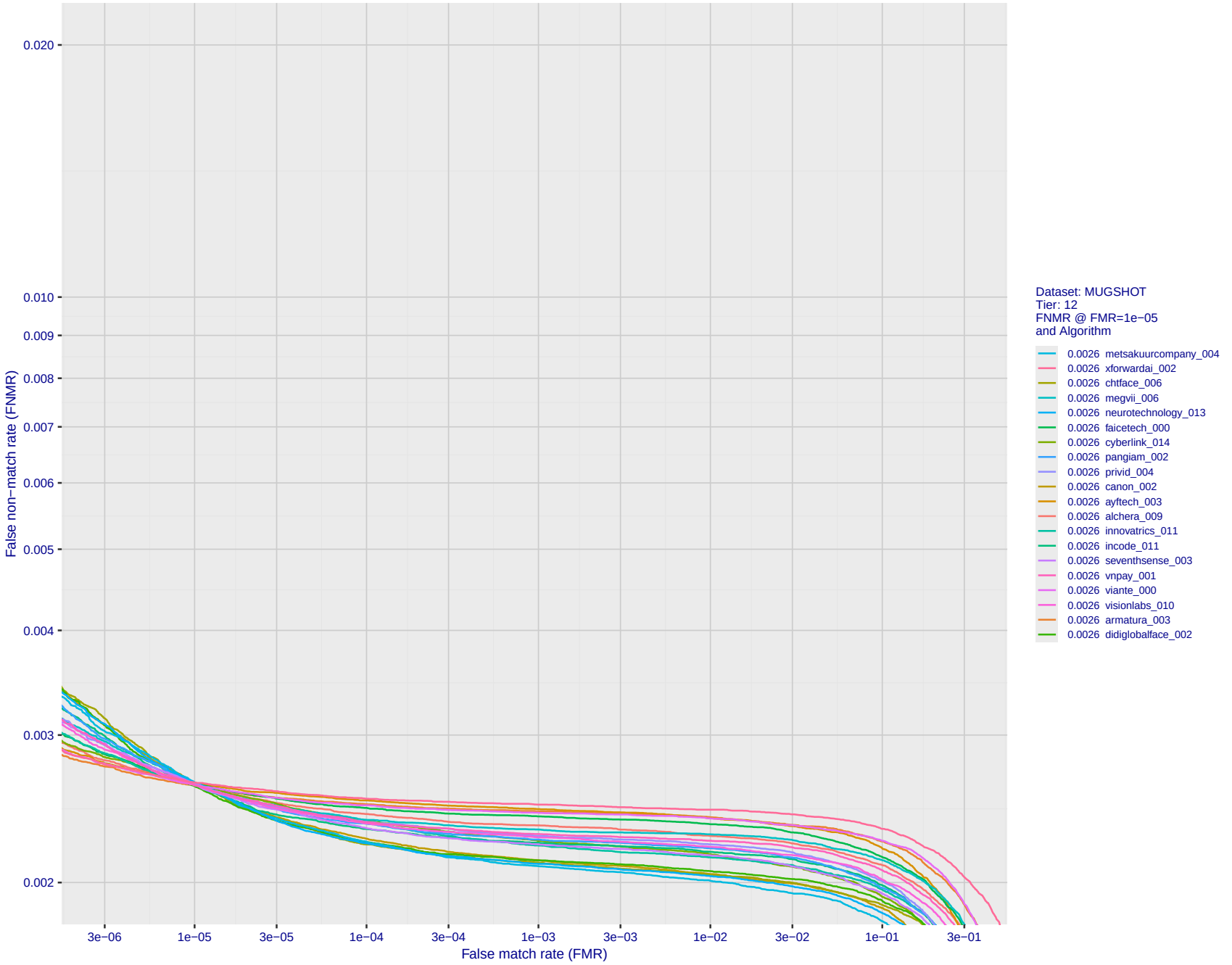

Figure 226: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

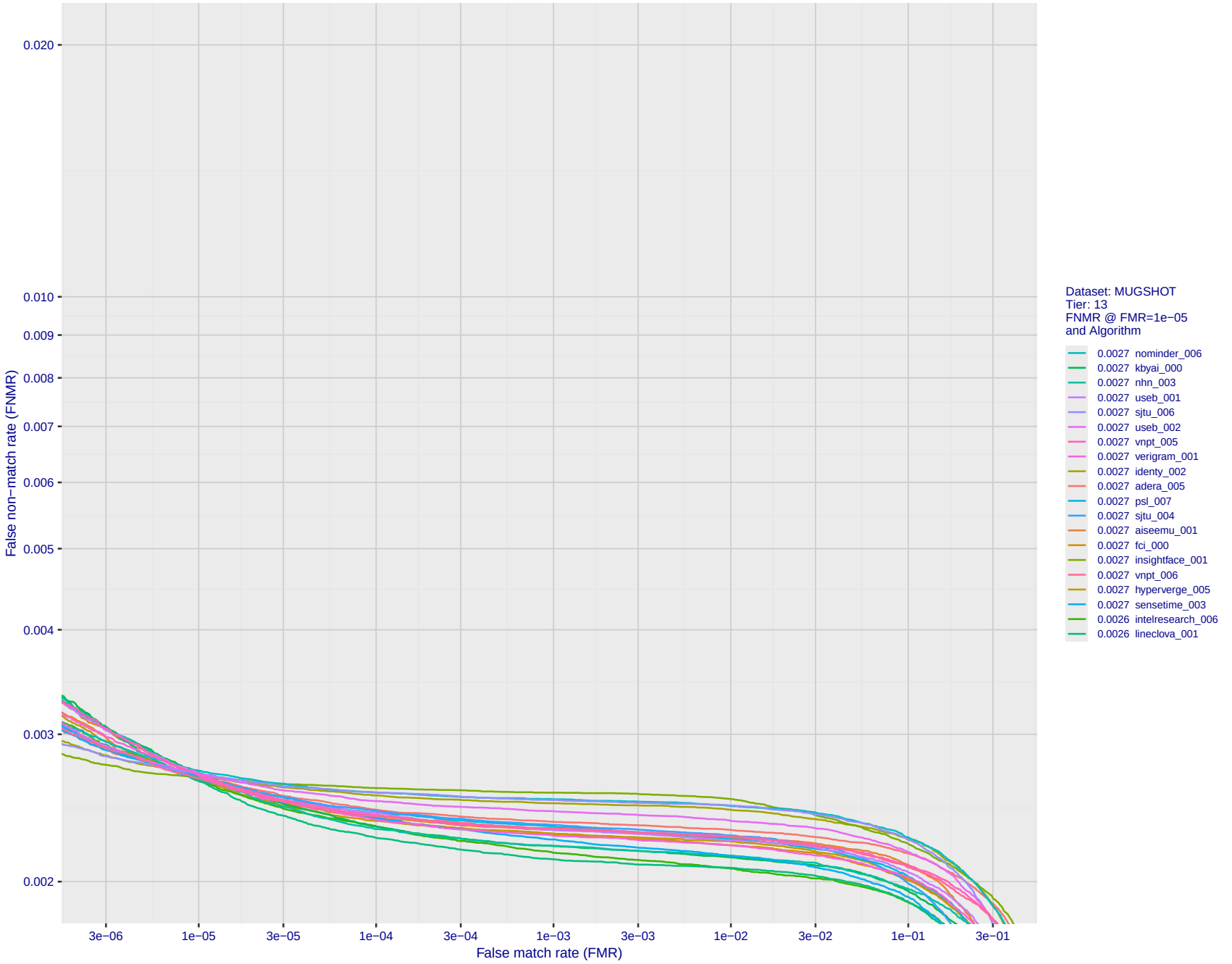

Figure 227: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

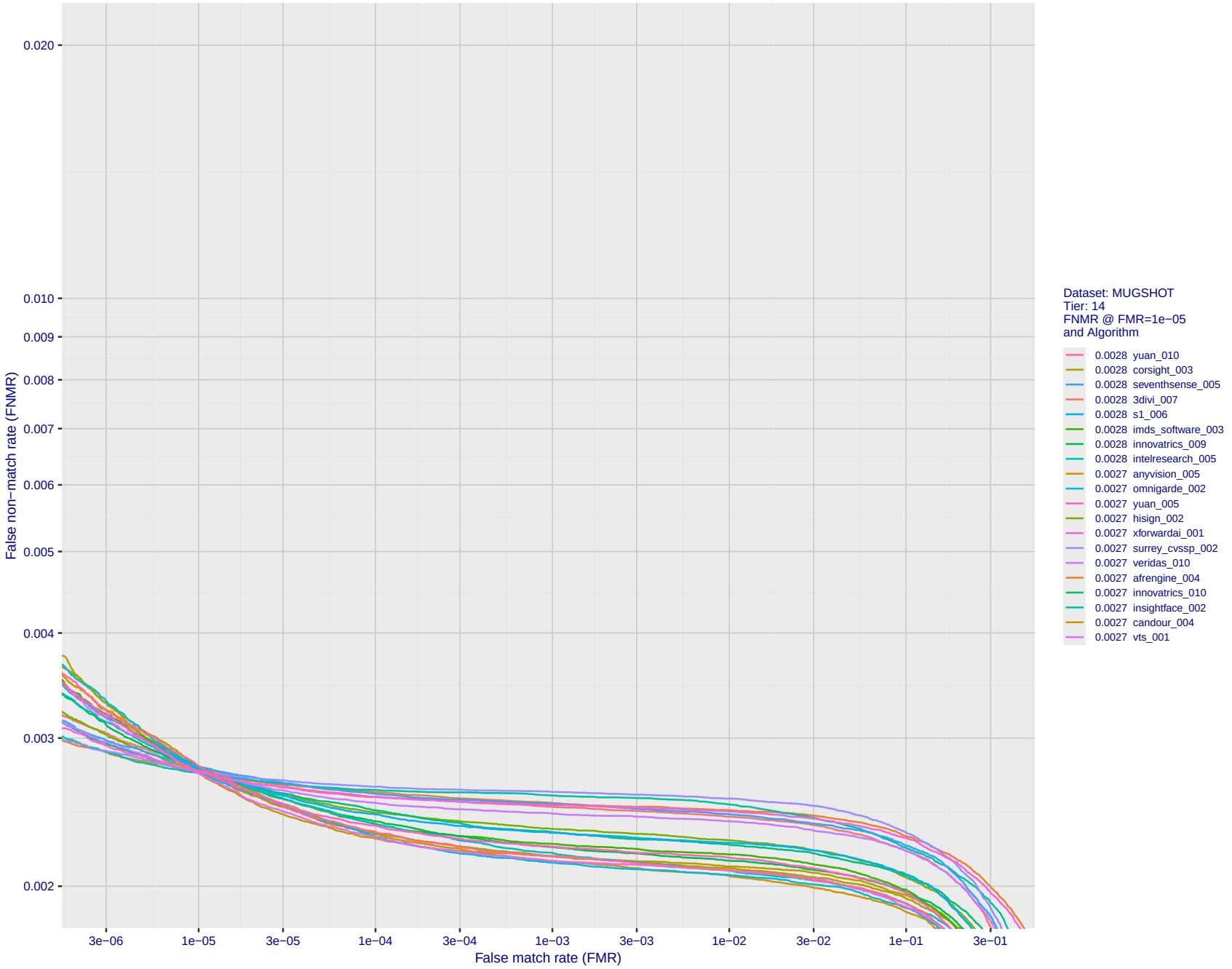

*Figure 228: For the mugshot images, detection error tradeoff (*DET*) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of* FMR*.*

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

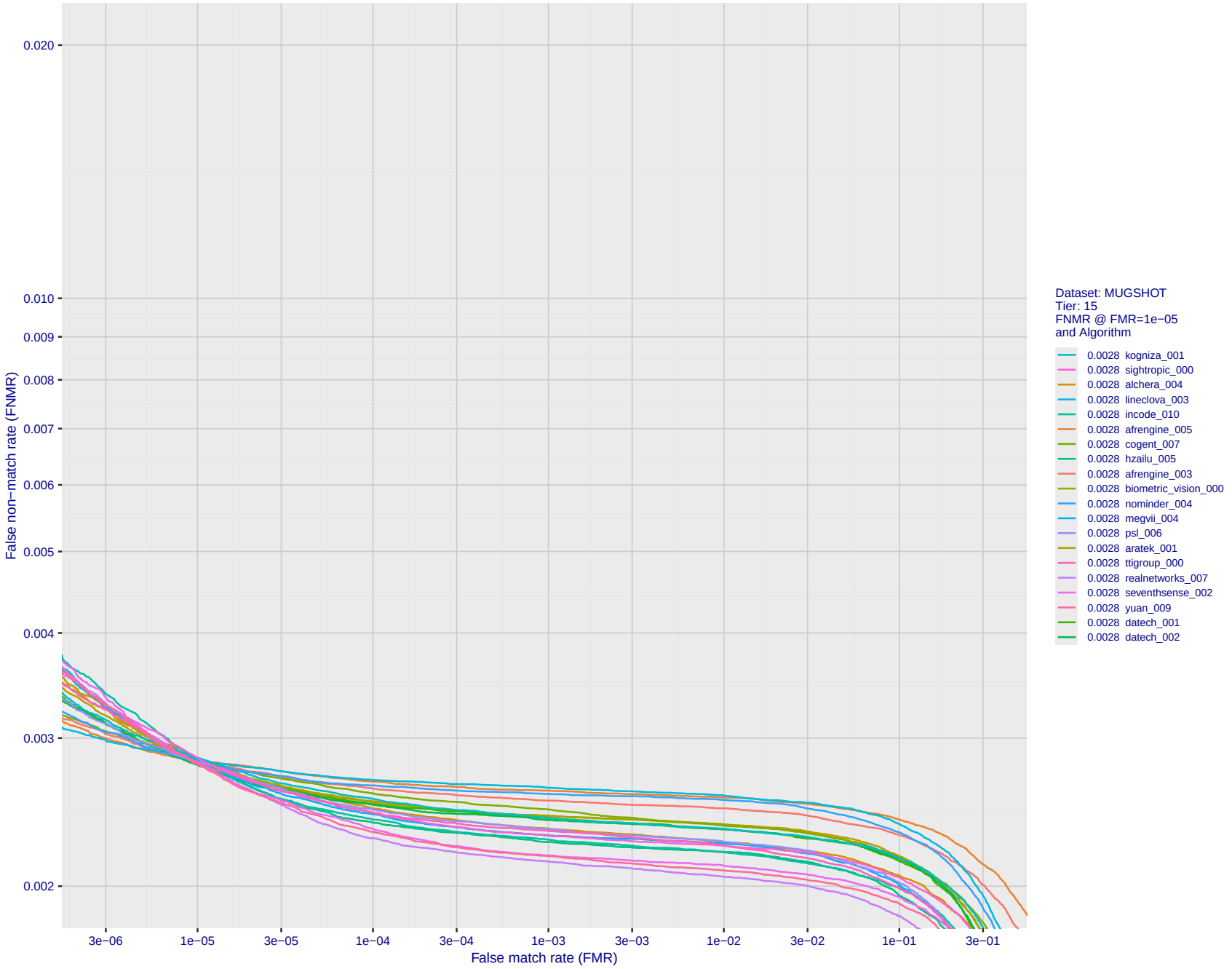

Figure 229: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

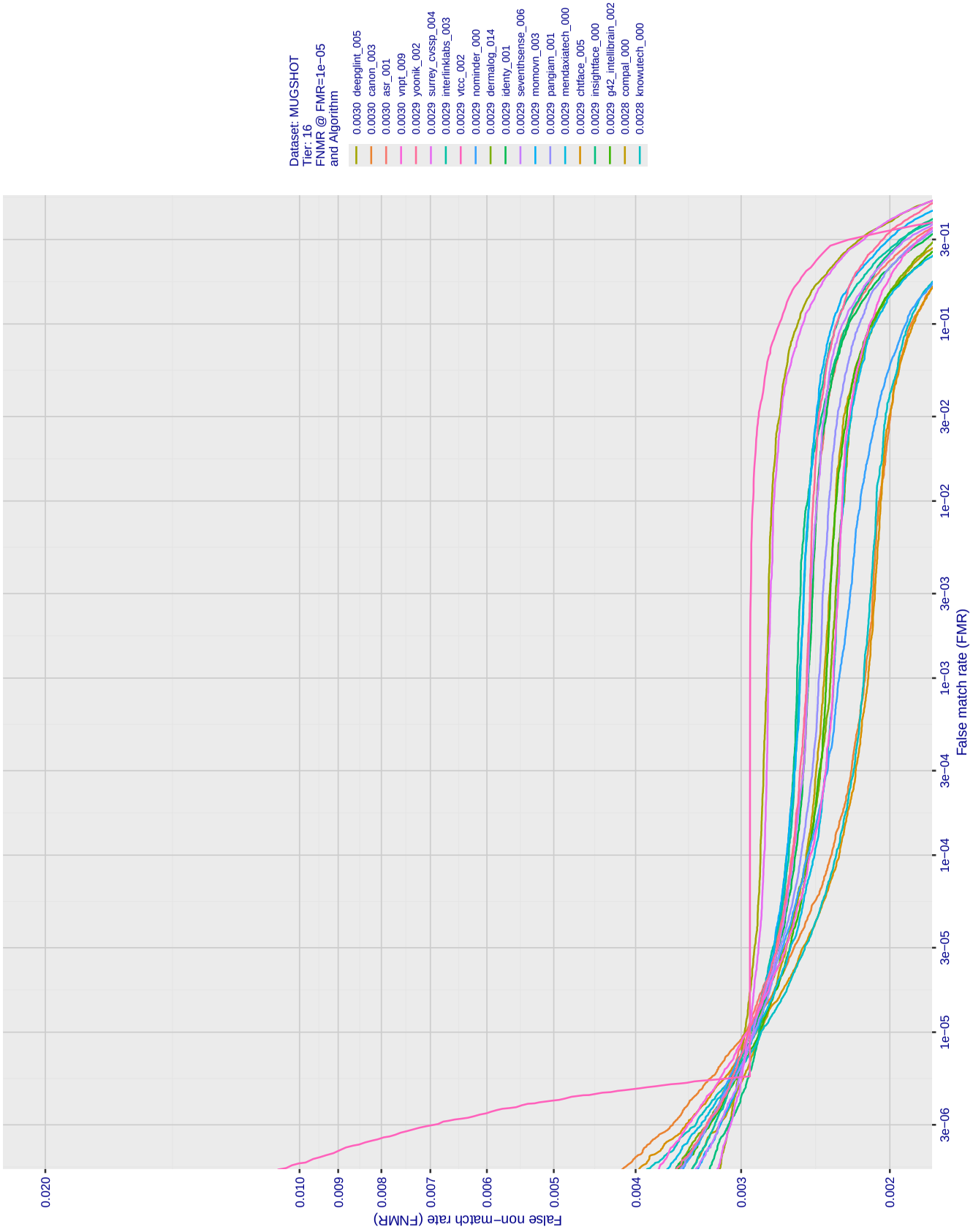

Figure 230: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

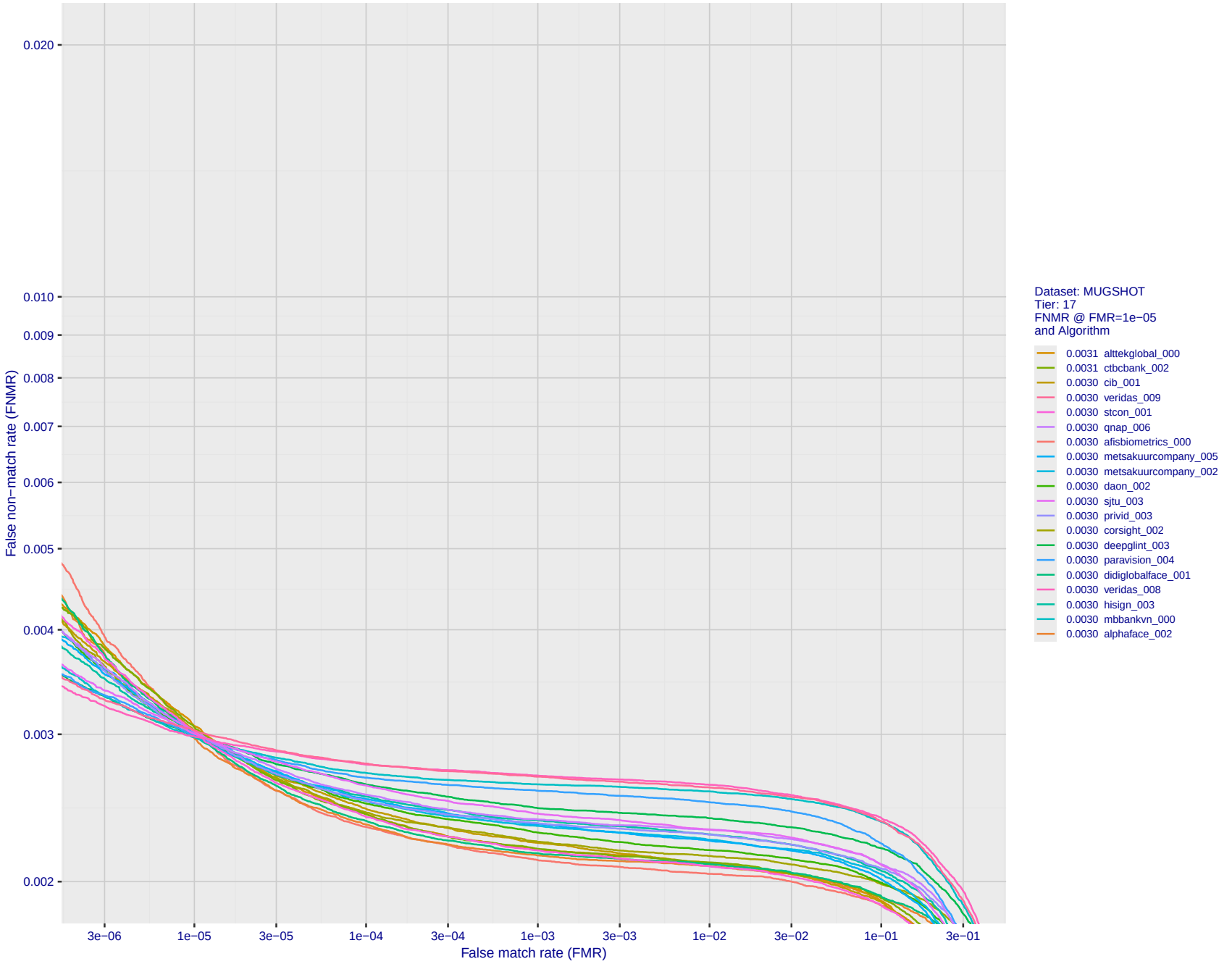

Figure 231: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

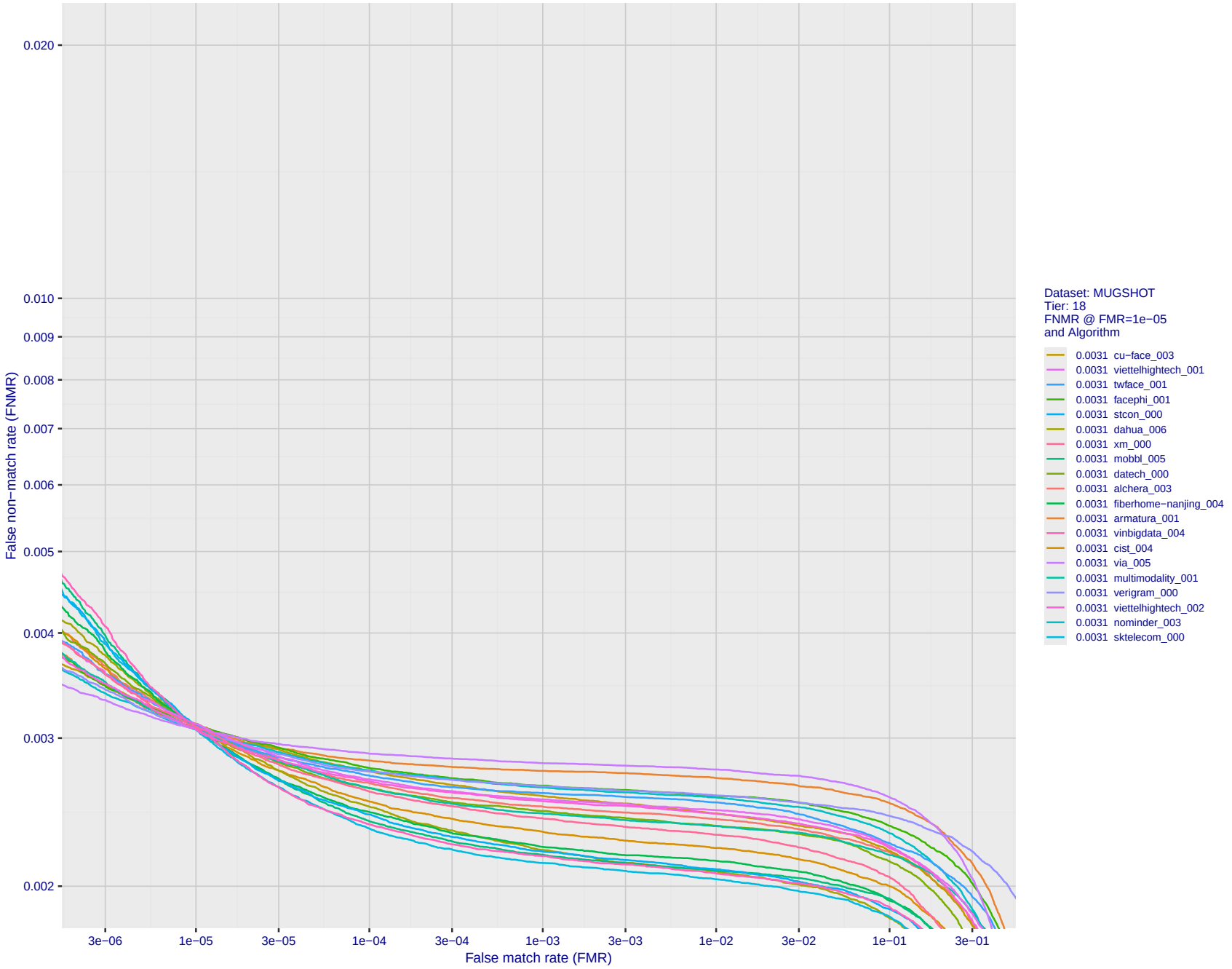

Figure 232: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

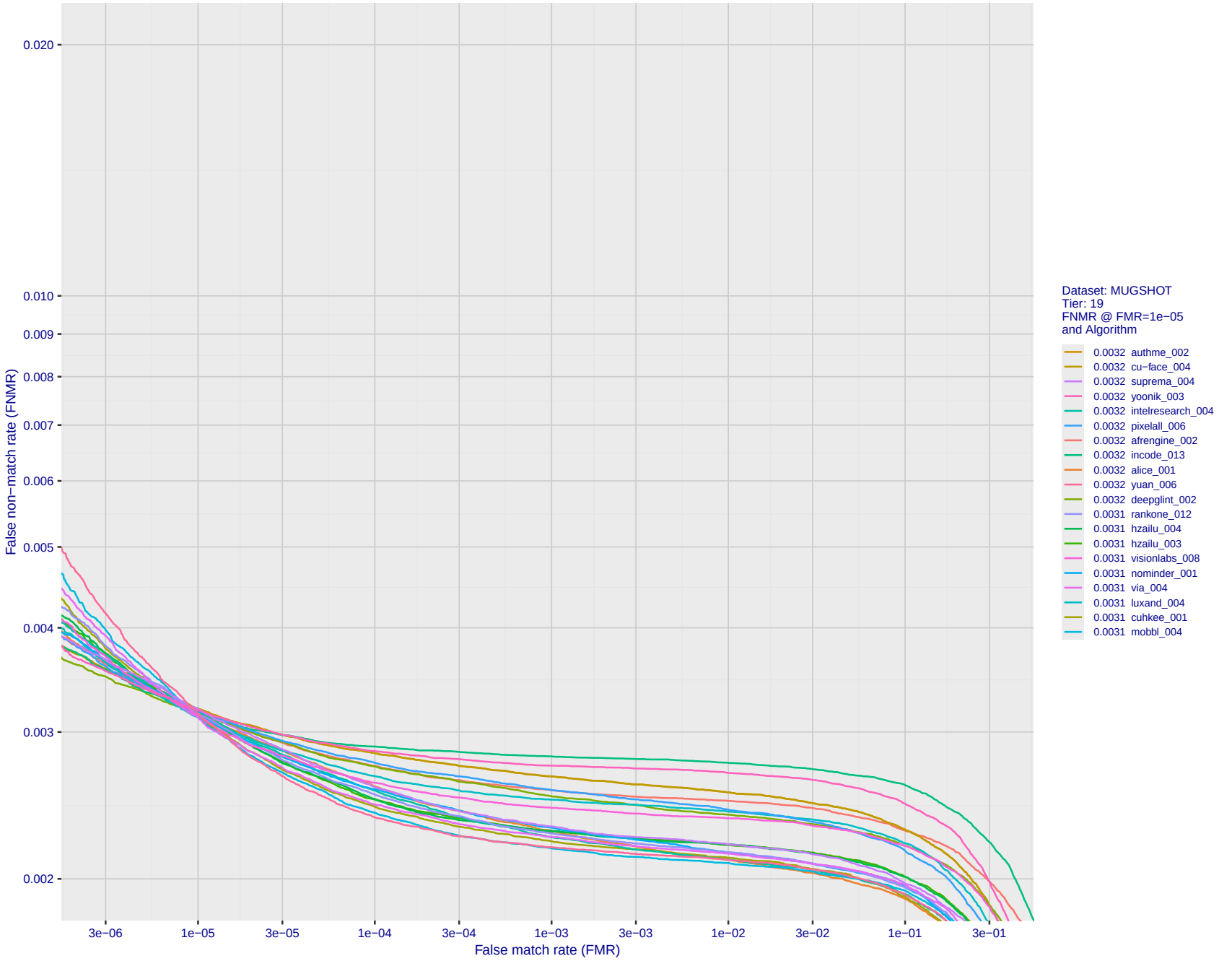

Figure 233: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

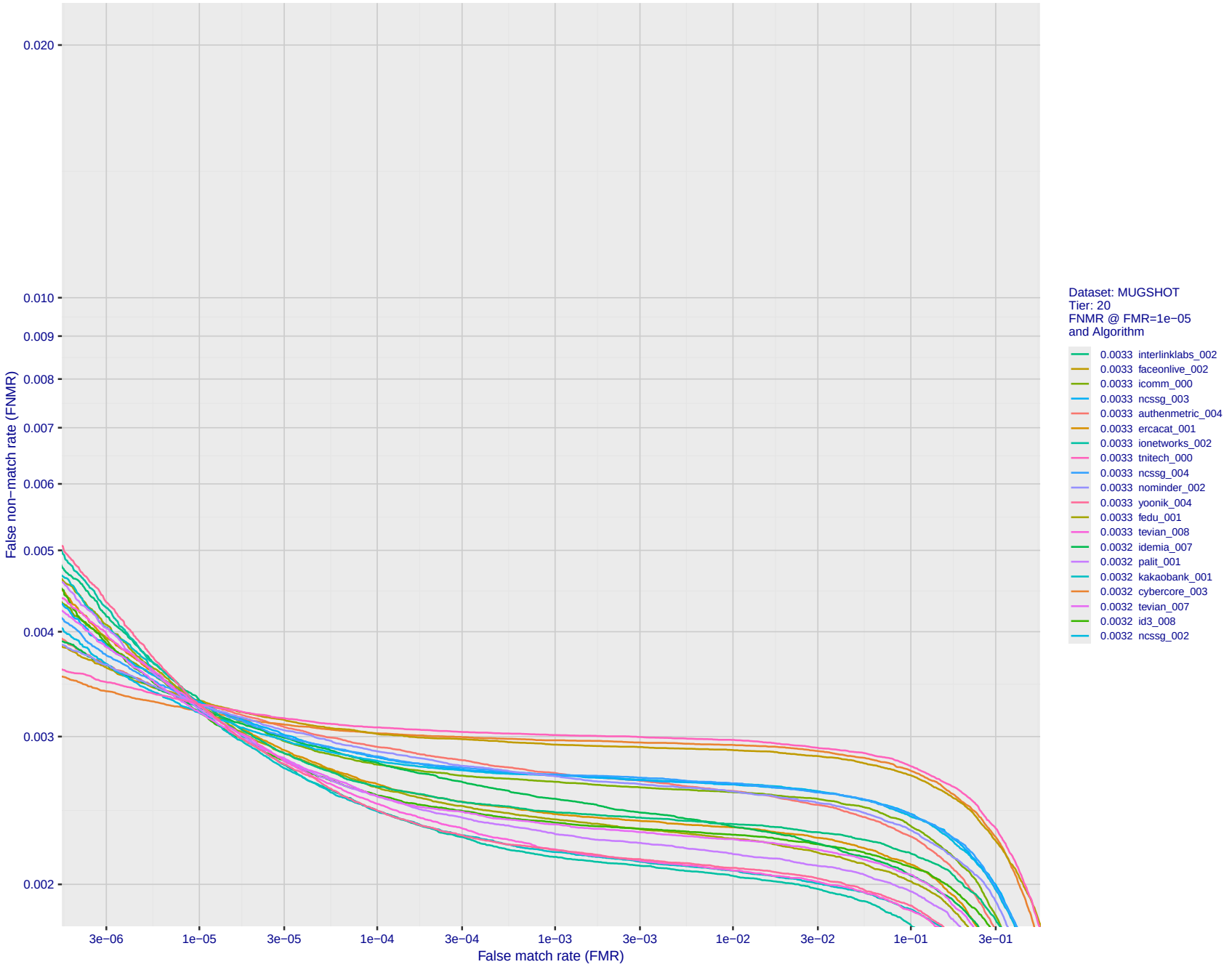

Figure 234: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

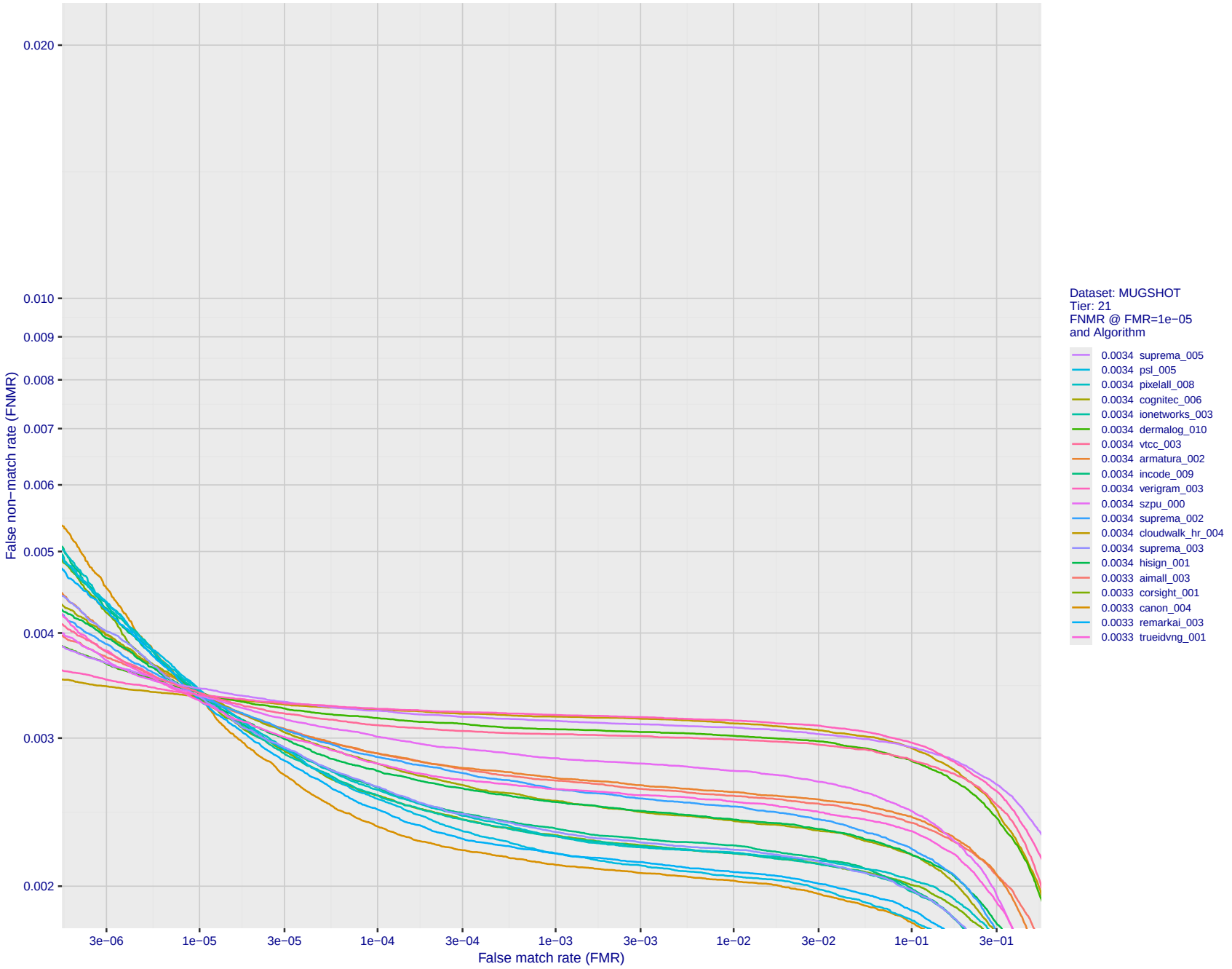

Figure 235: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

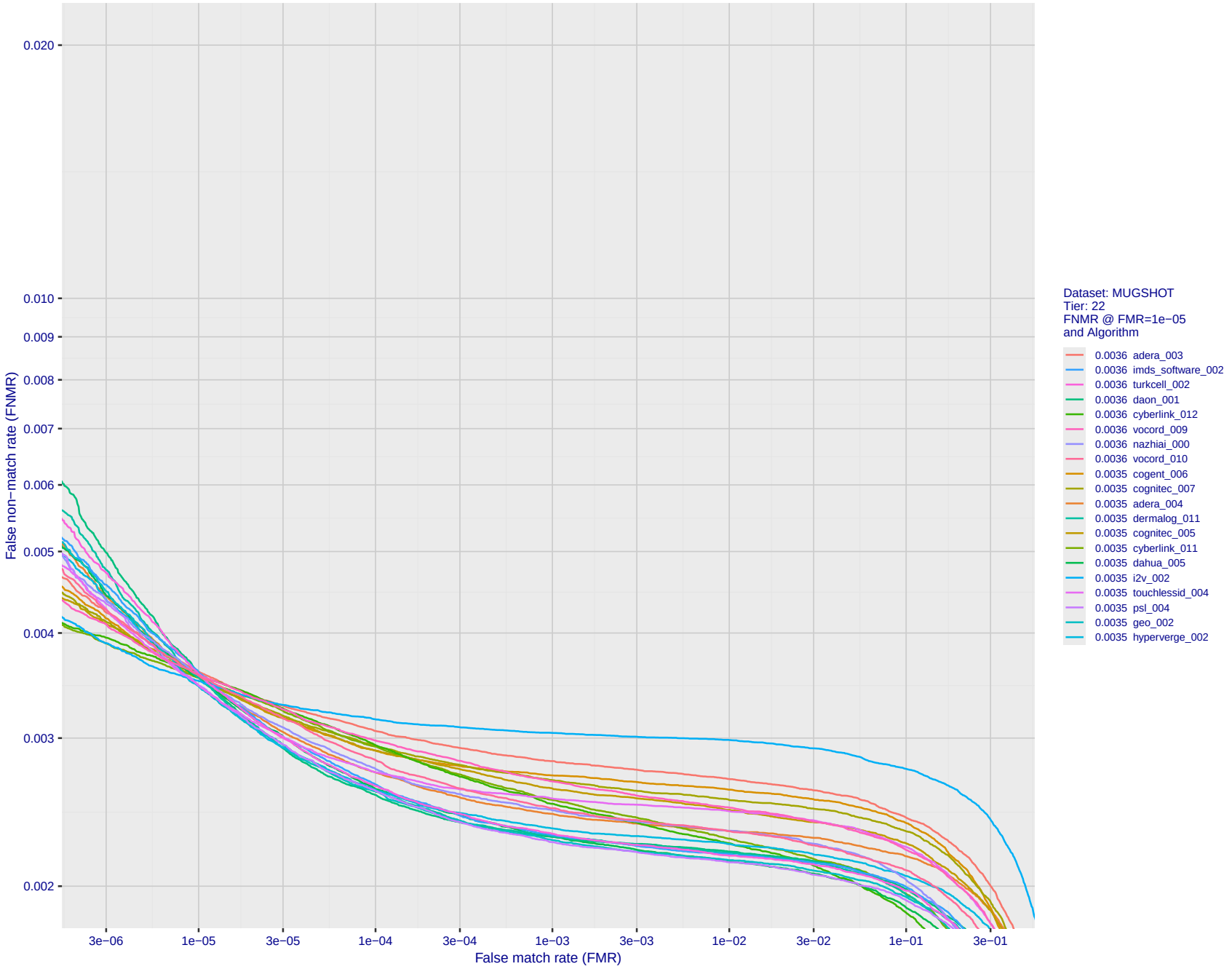

Figure 236: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

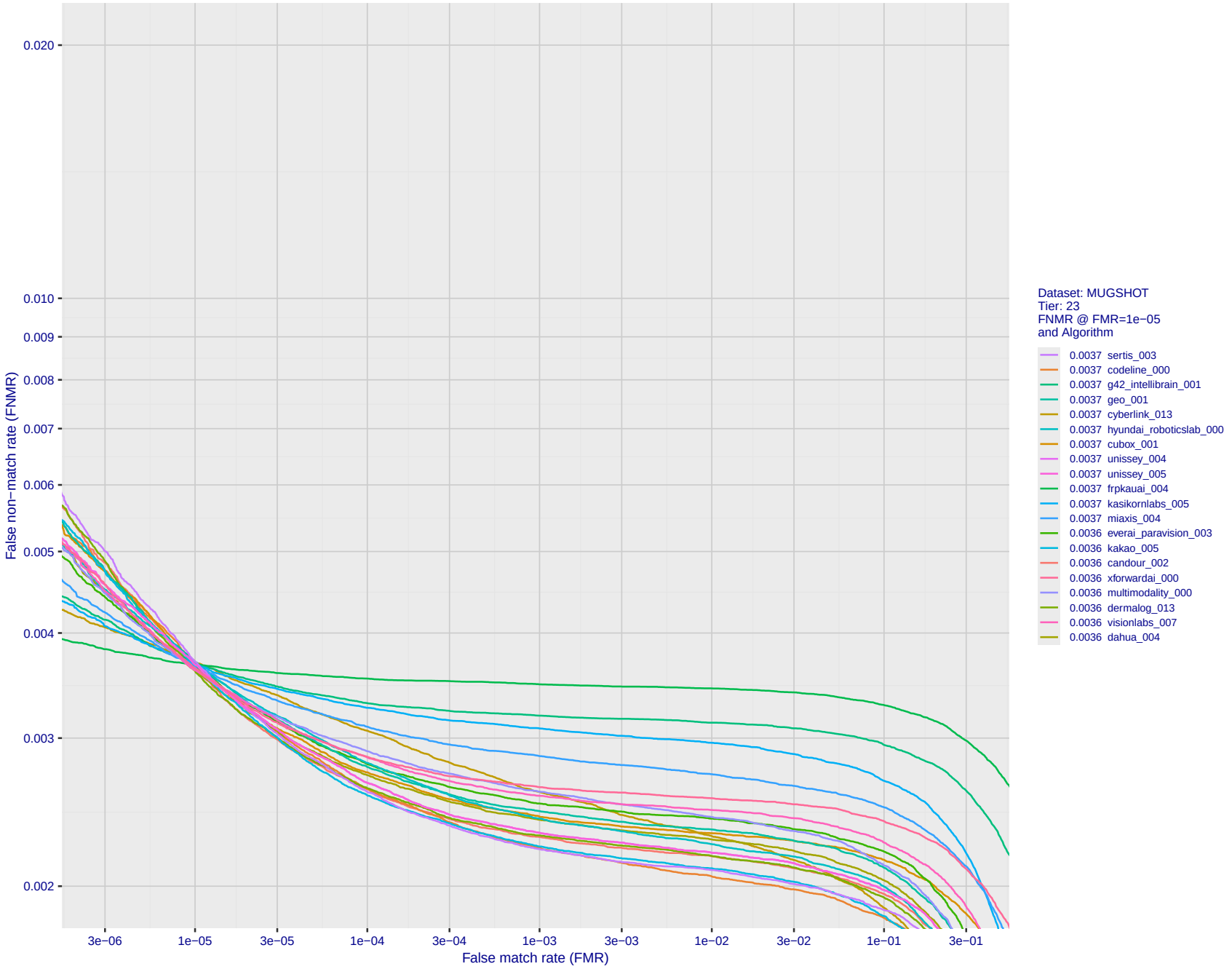

Figure 237: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

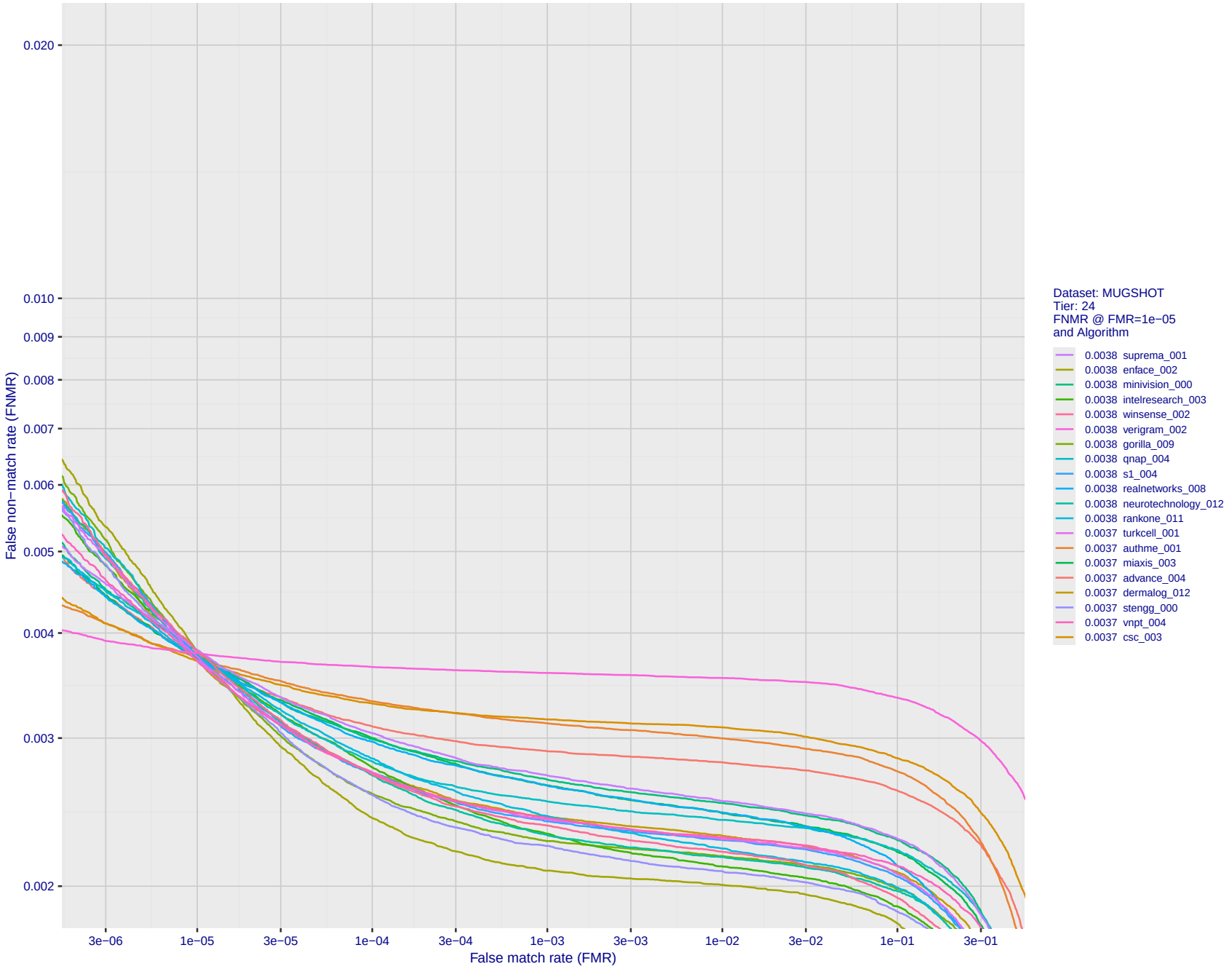

Figure 238: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

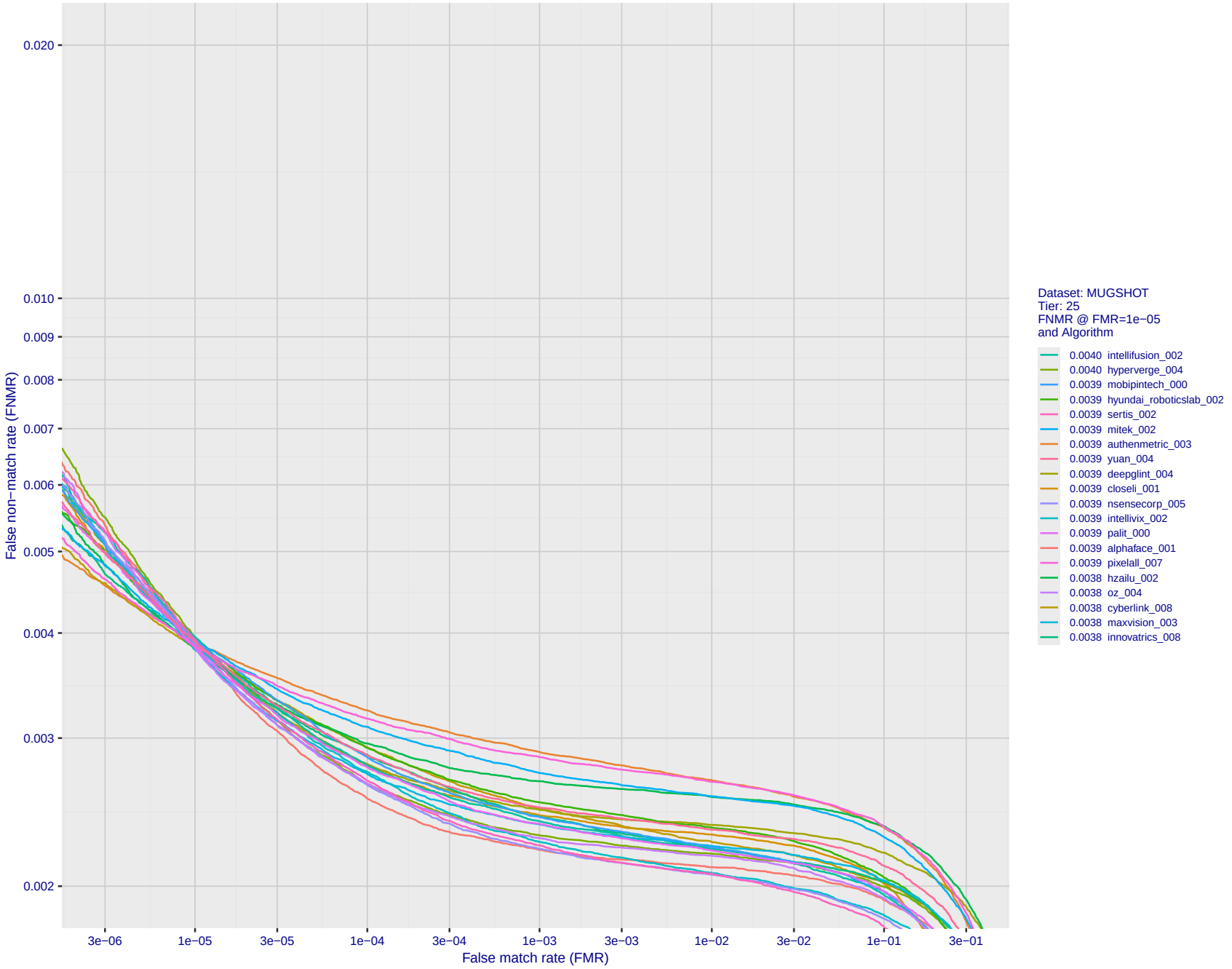

Figure 239: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

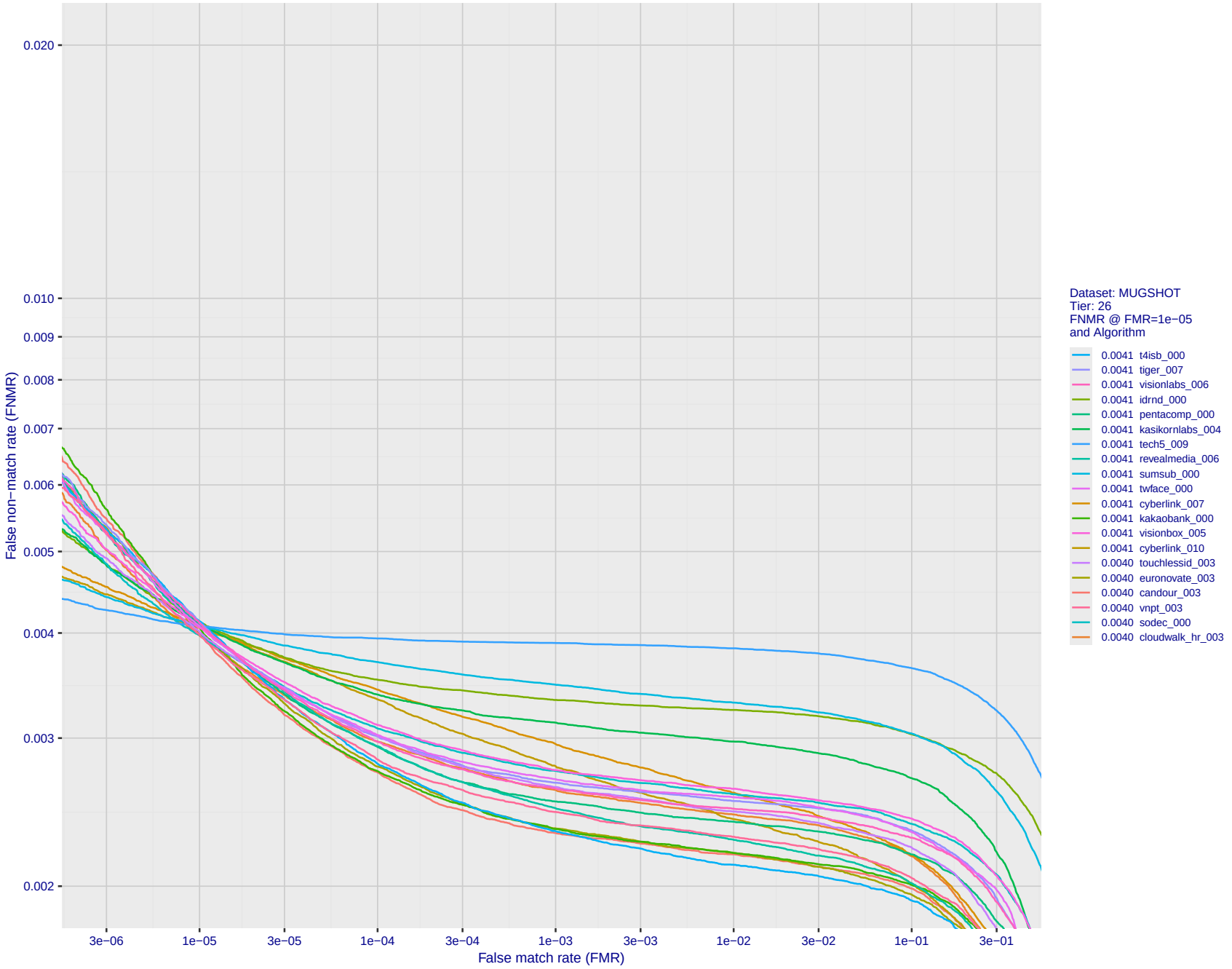

Figure 240: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

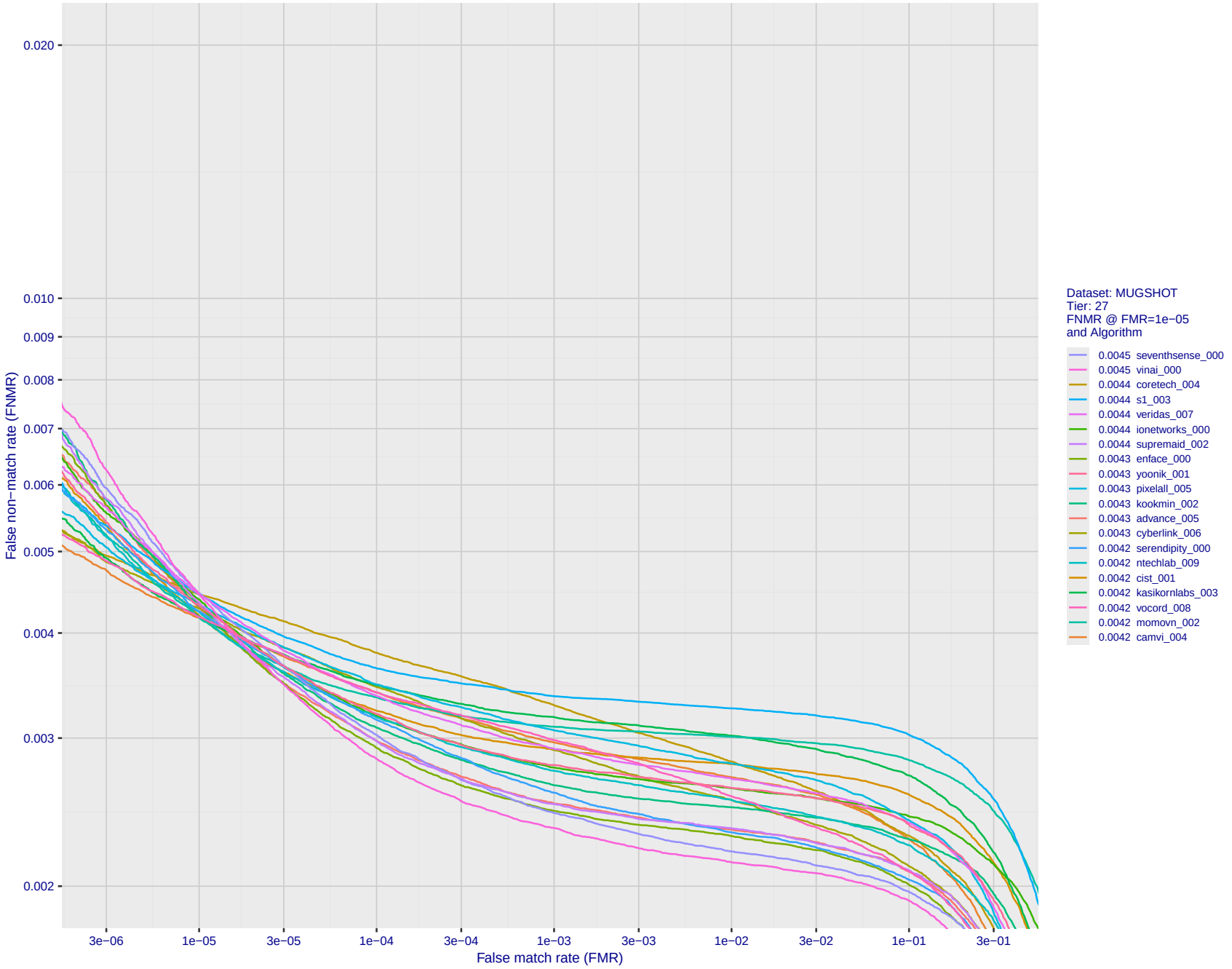

Figure 241: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

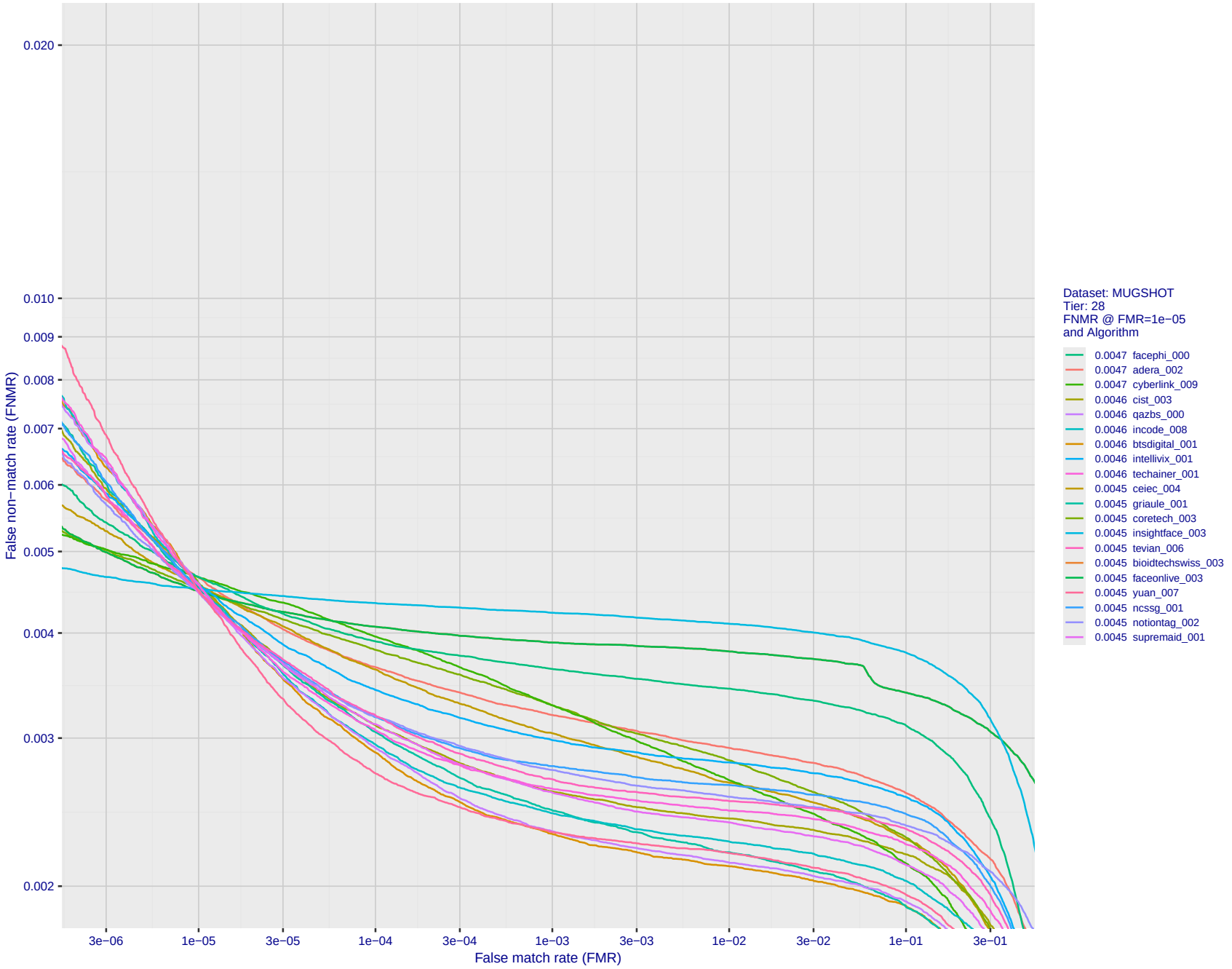

Figure 242: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

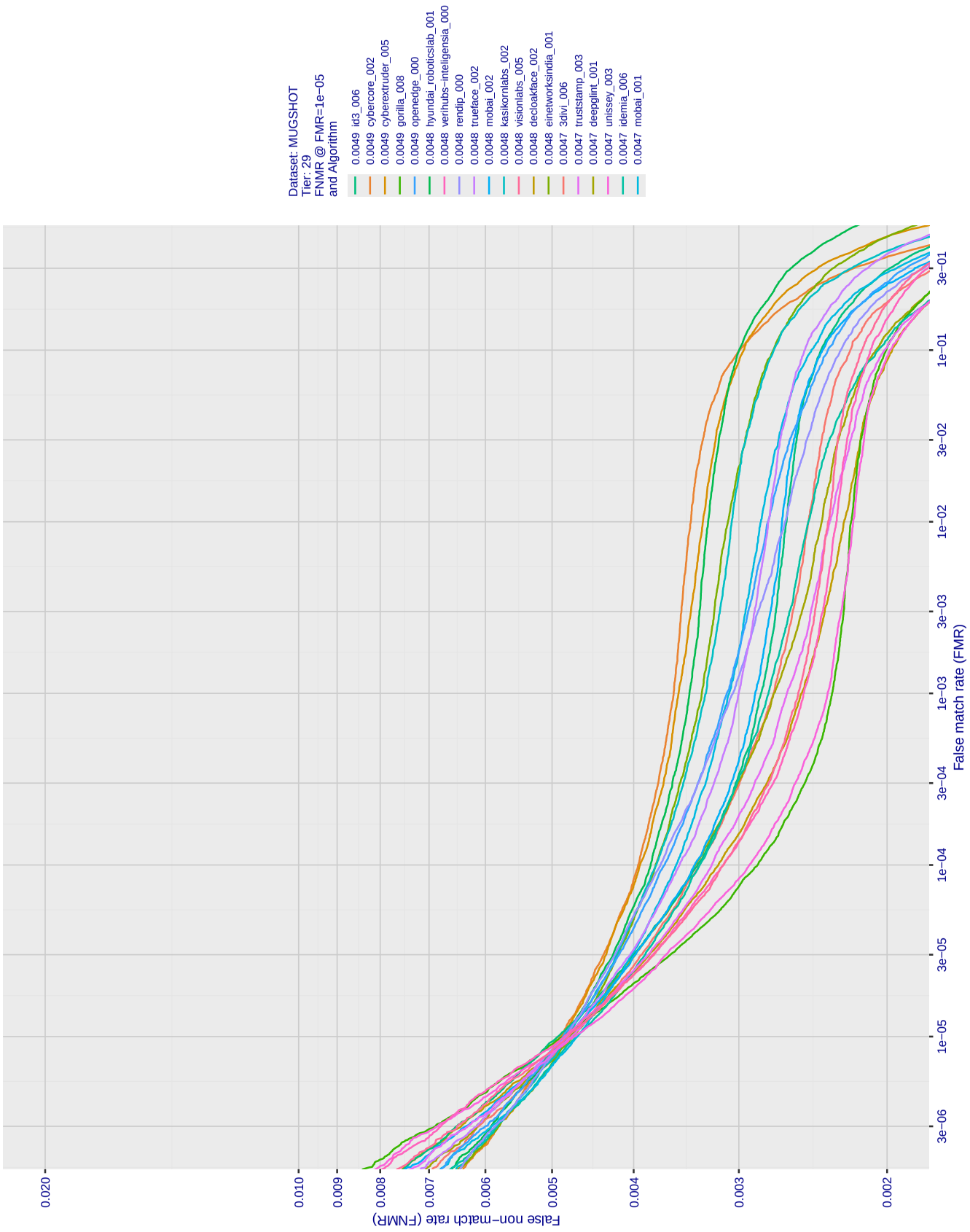

Figure 243: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

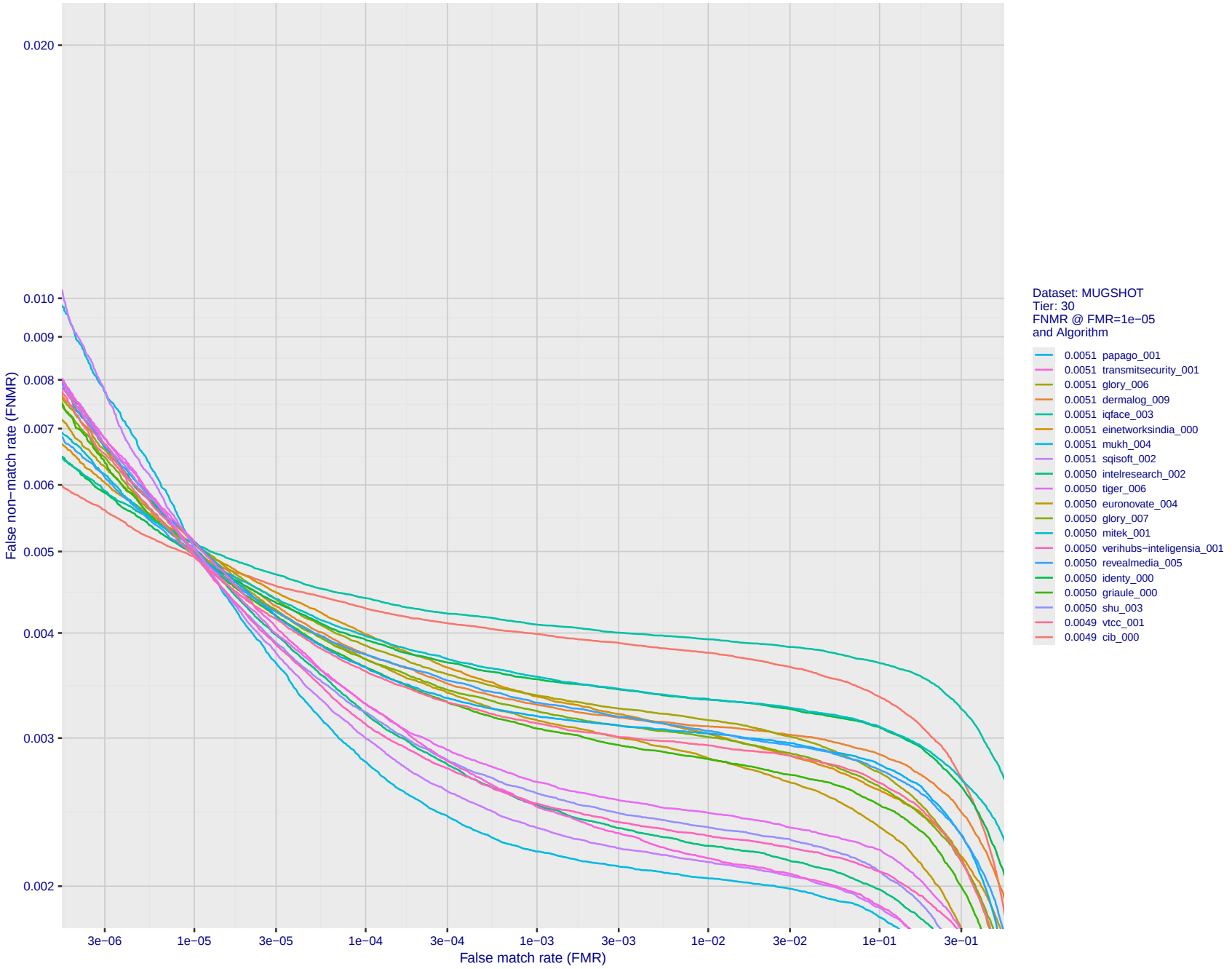

Figure 244: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

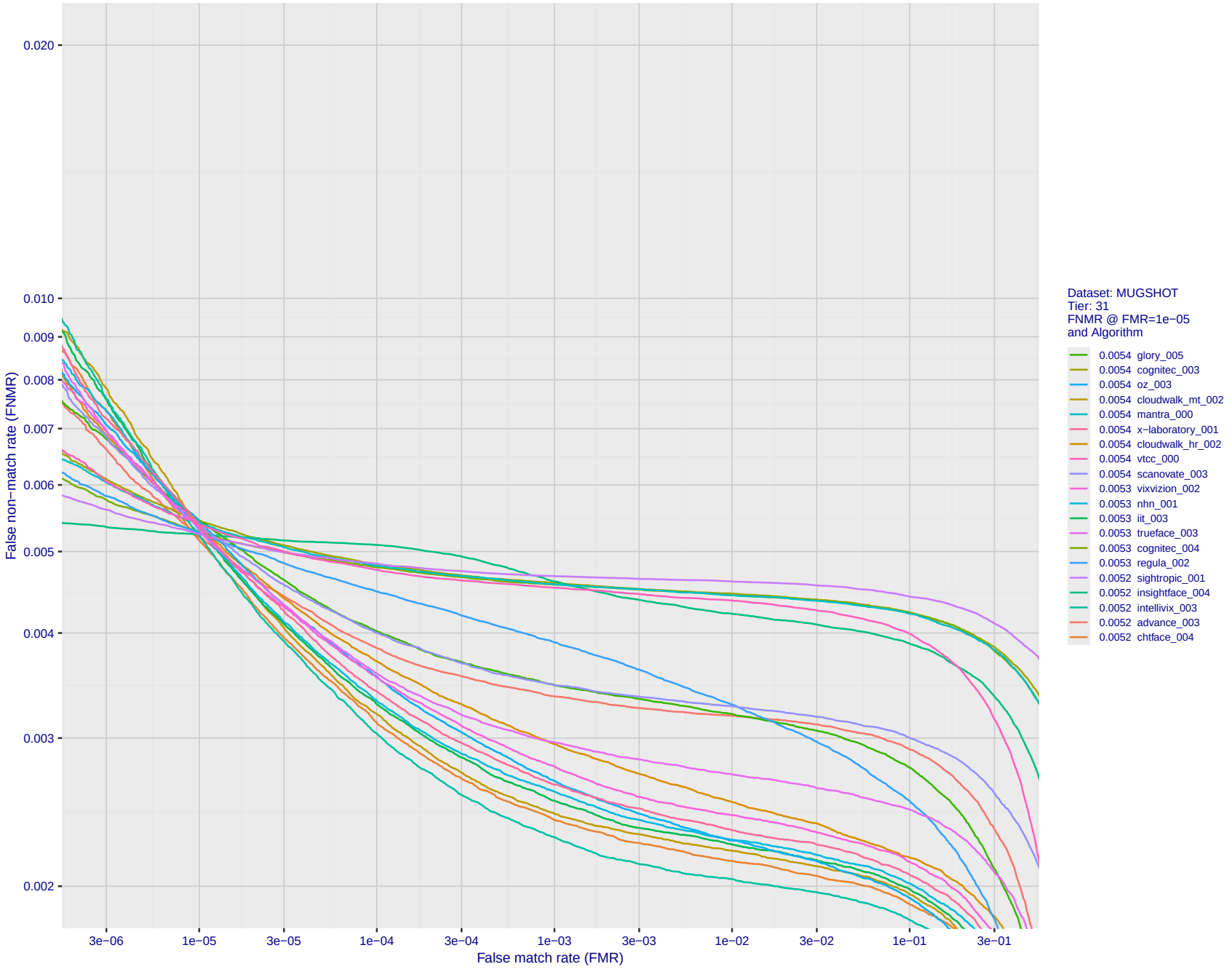

Figure 245: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

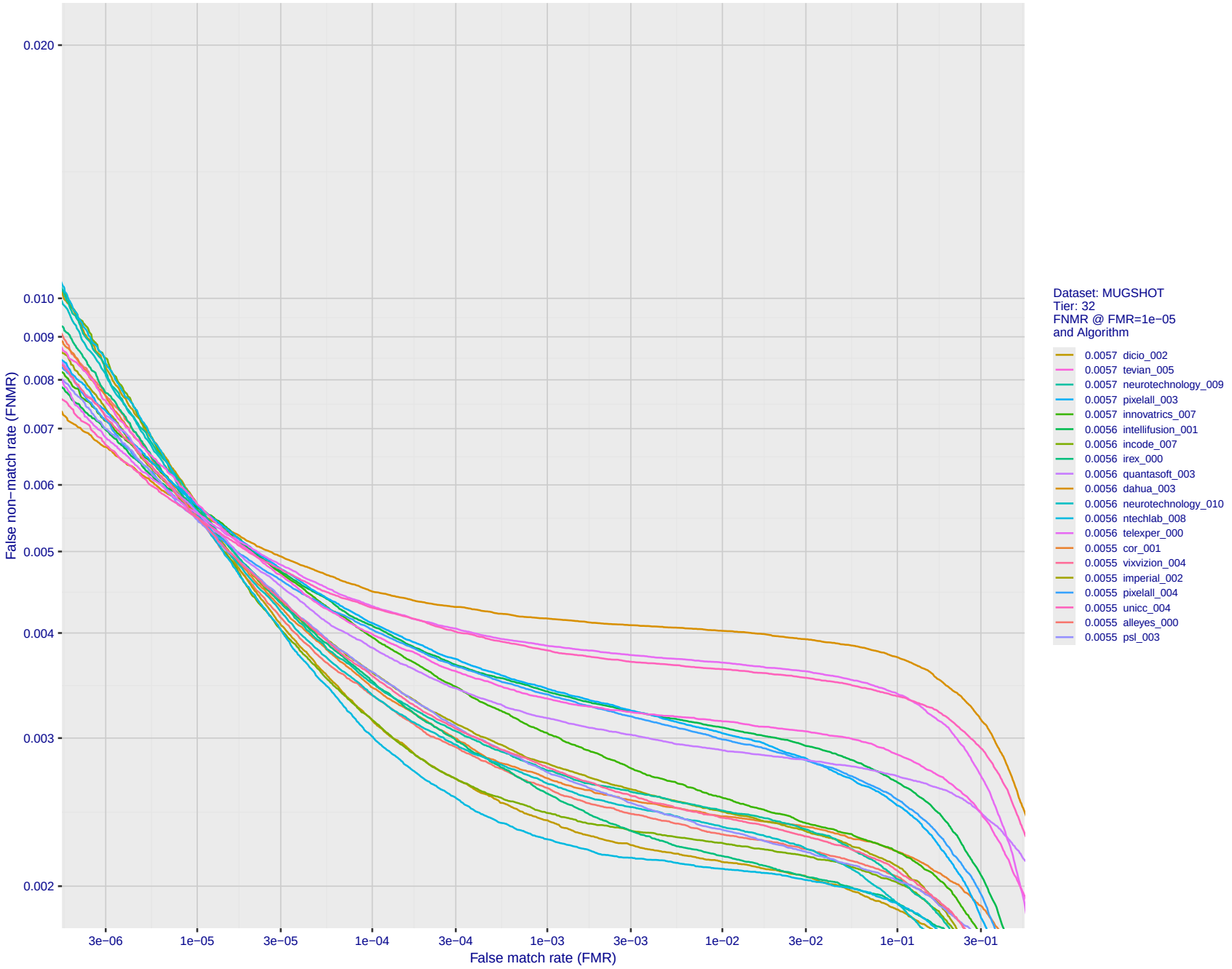

Figure 246: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

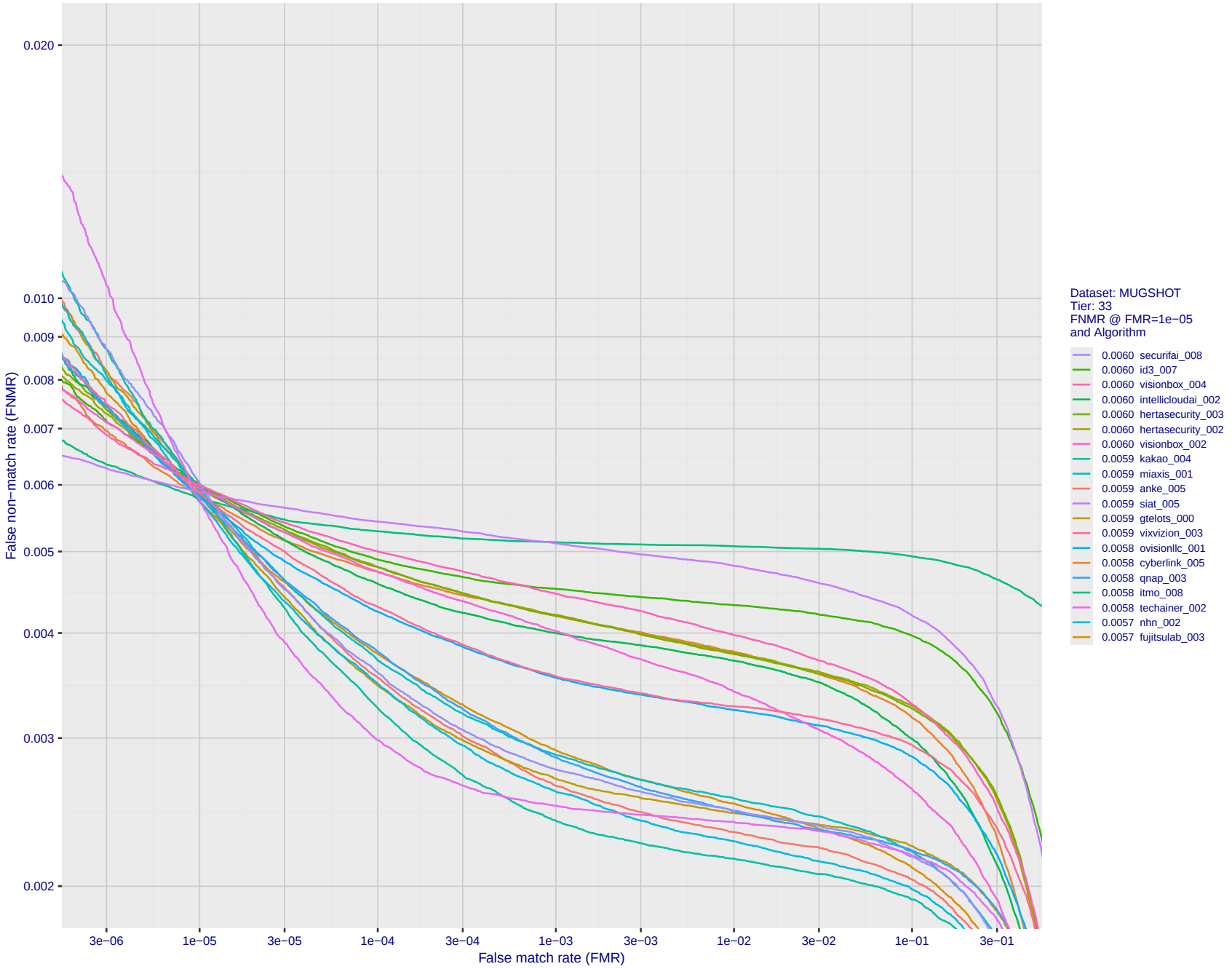

Figure 247: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

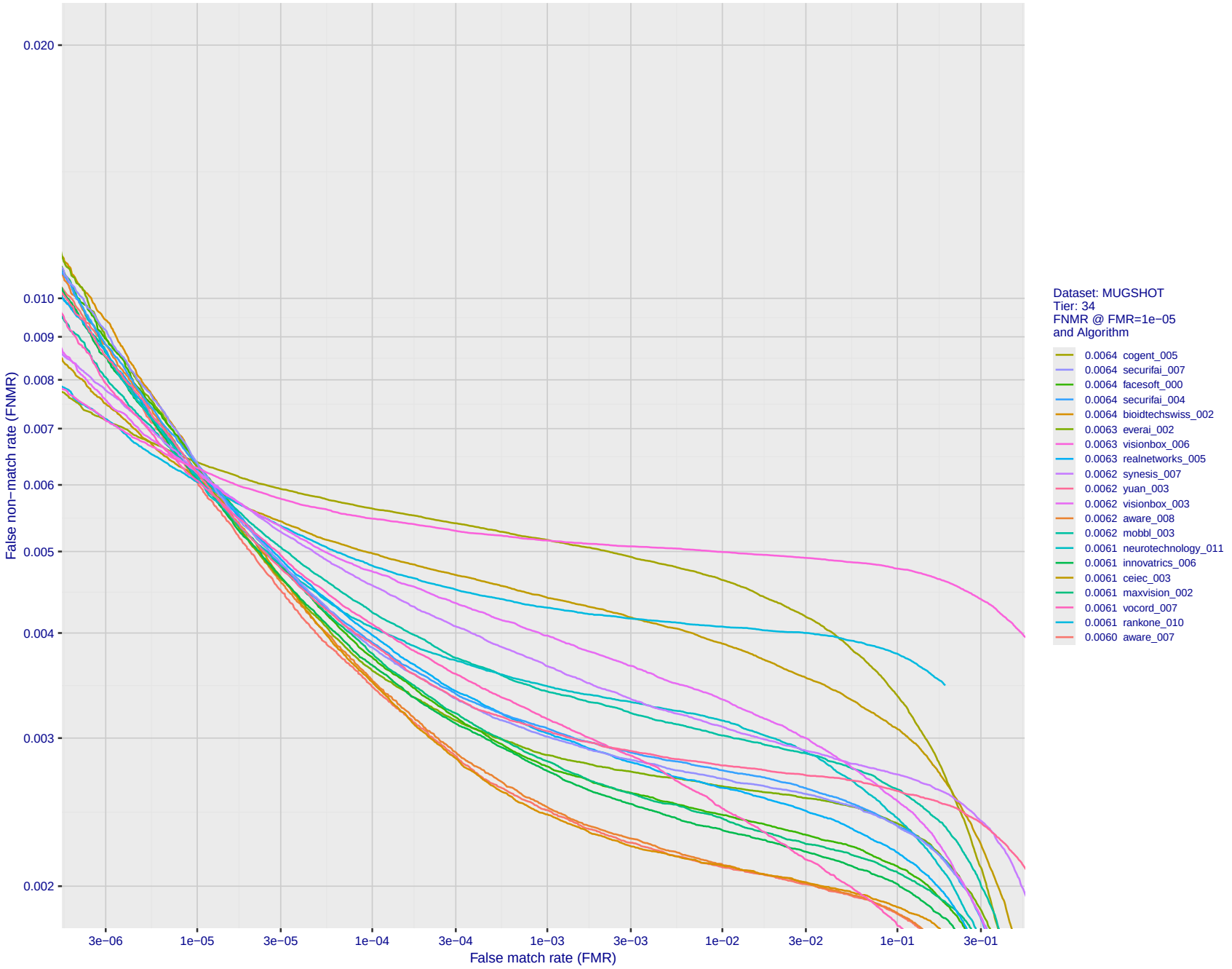

Figure 248: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

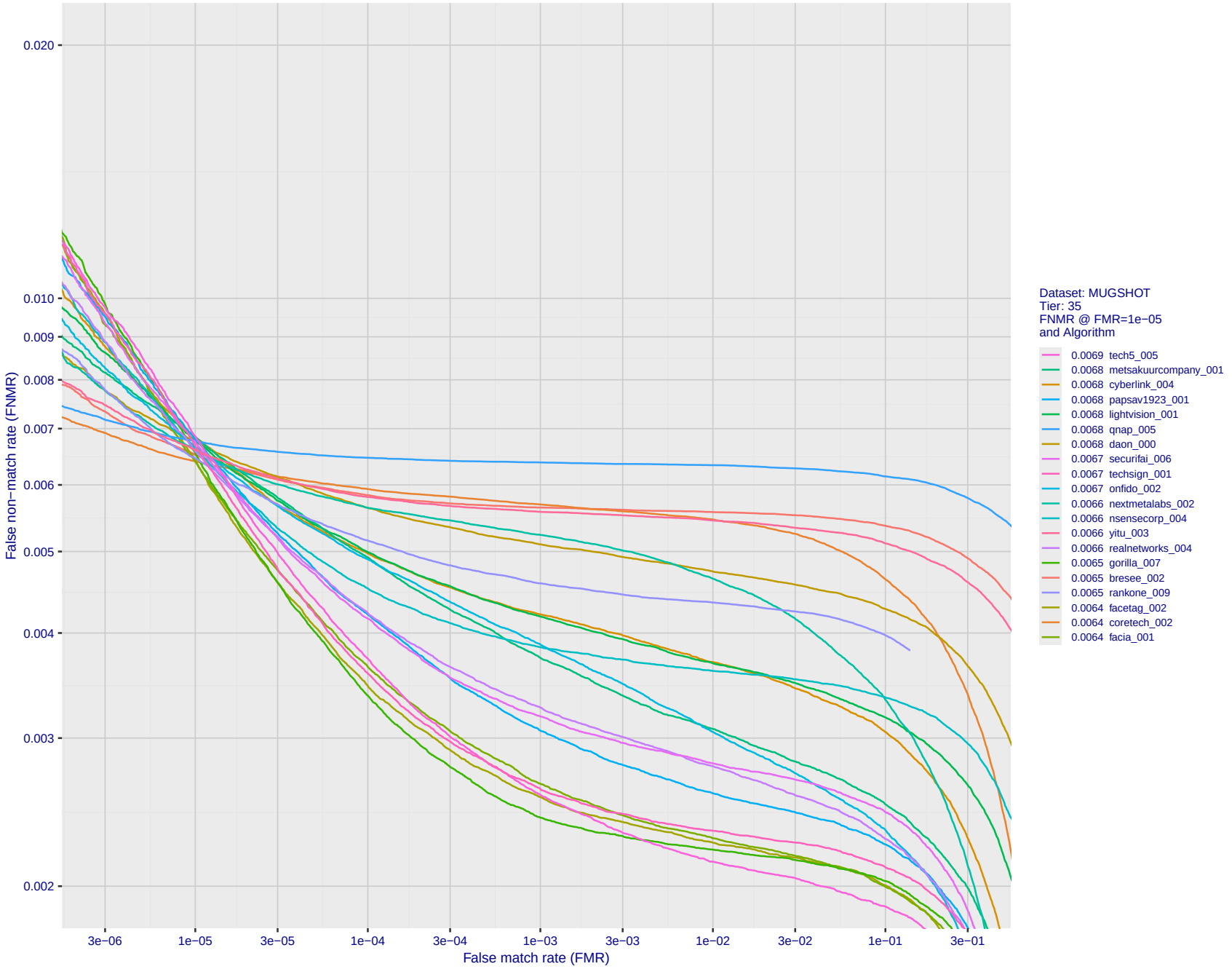

Figure 249: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

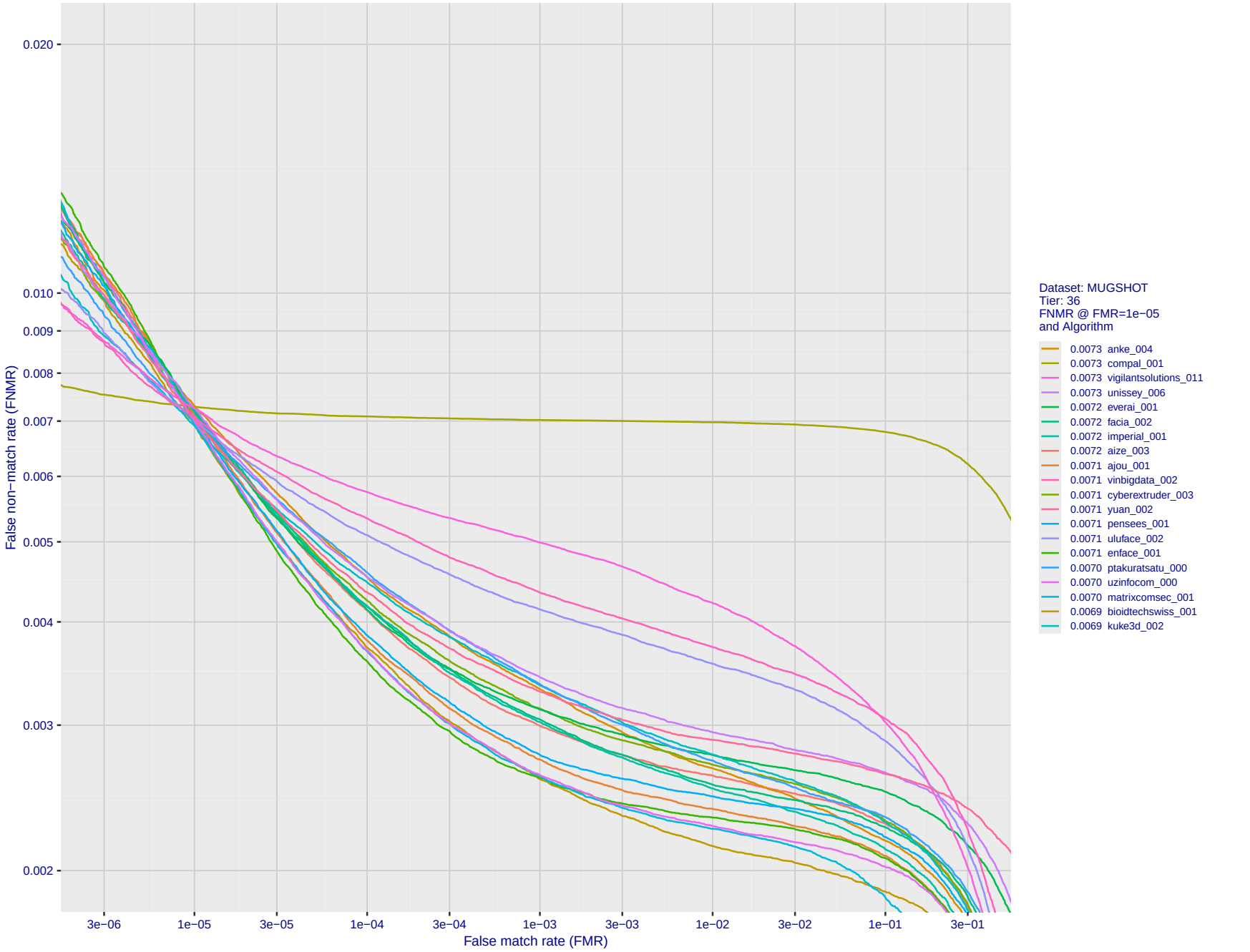

Figure 250: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

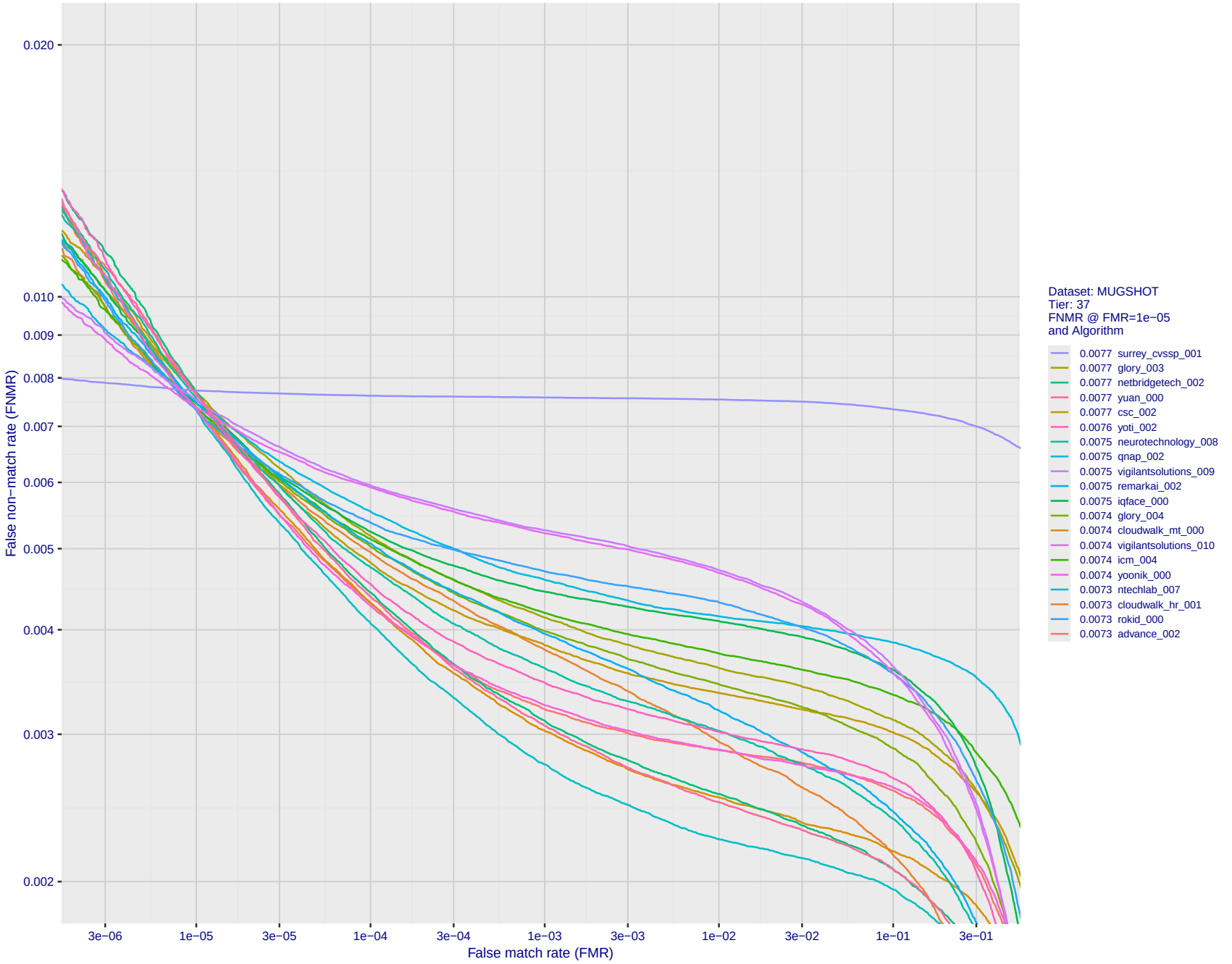

Figure 251: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

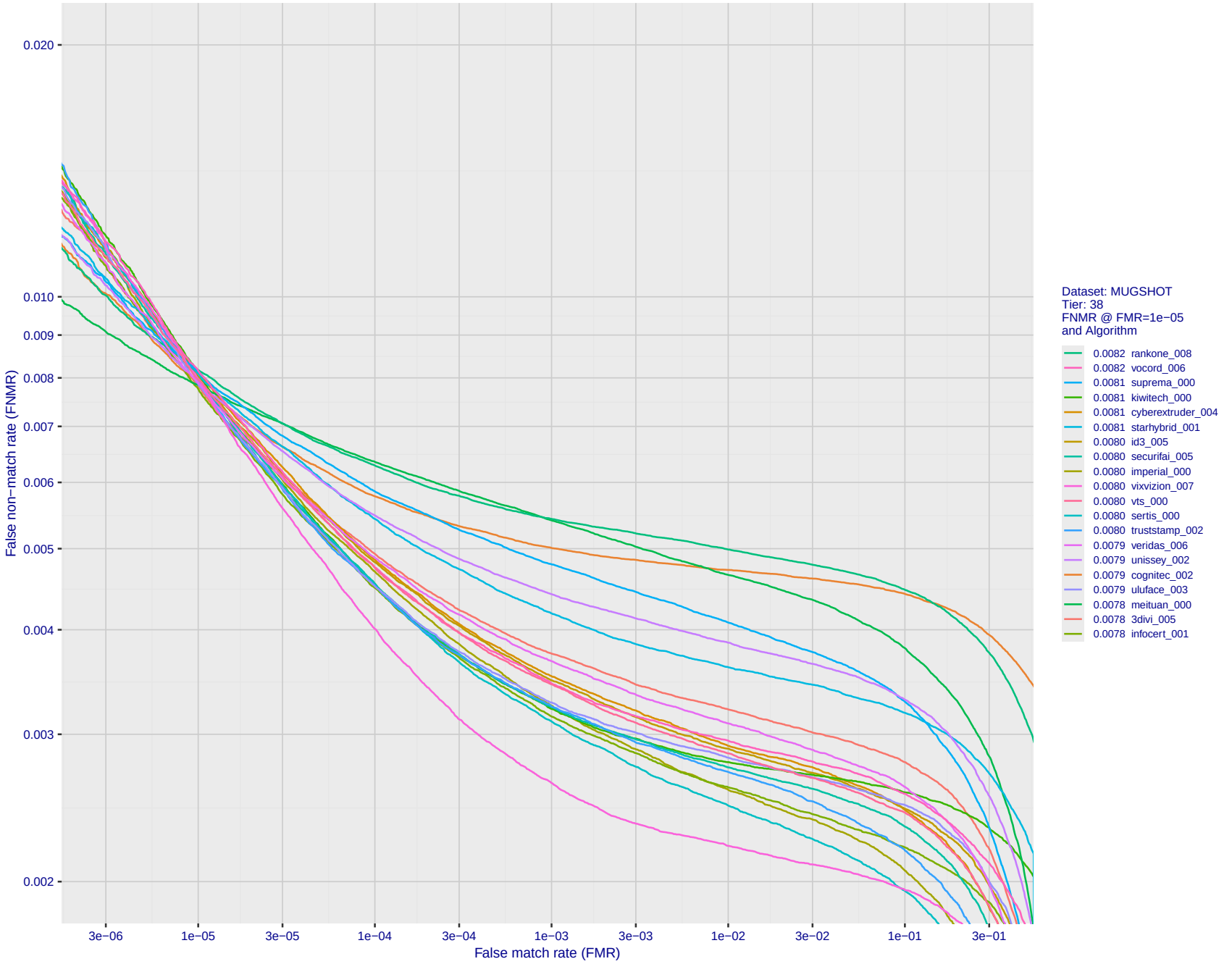

Figure 252: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

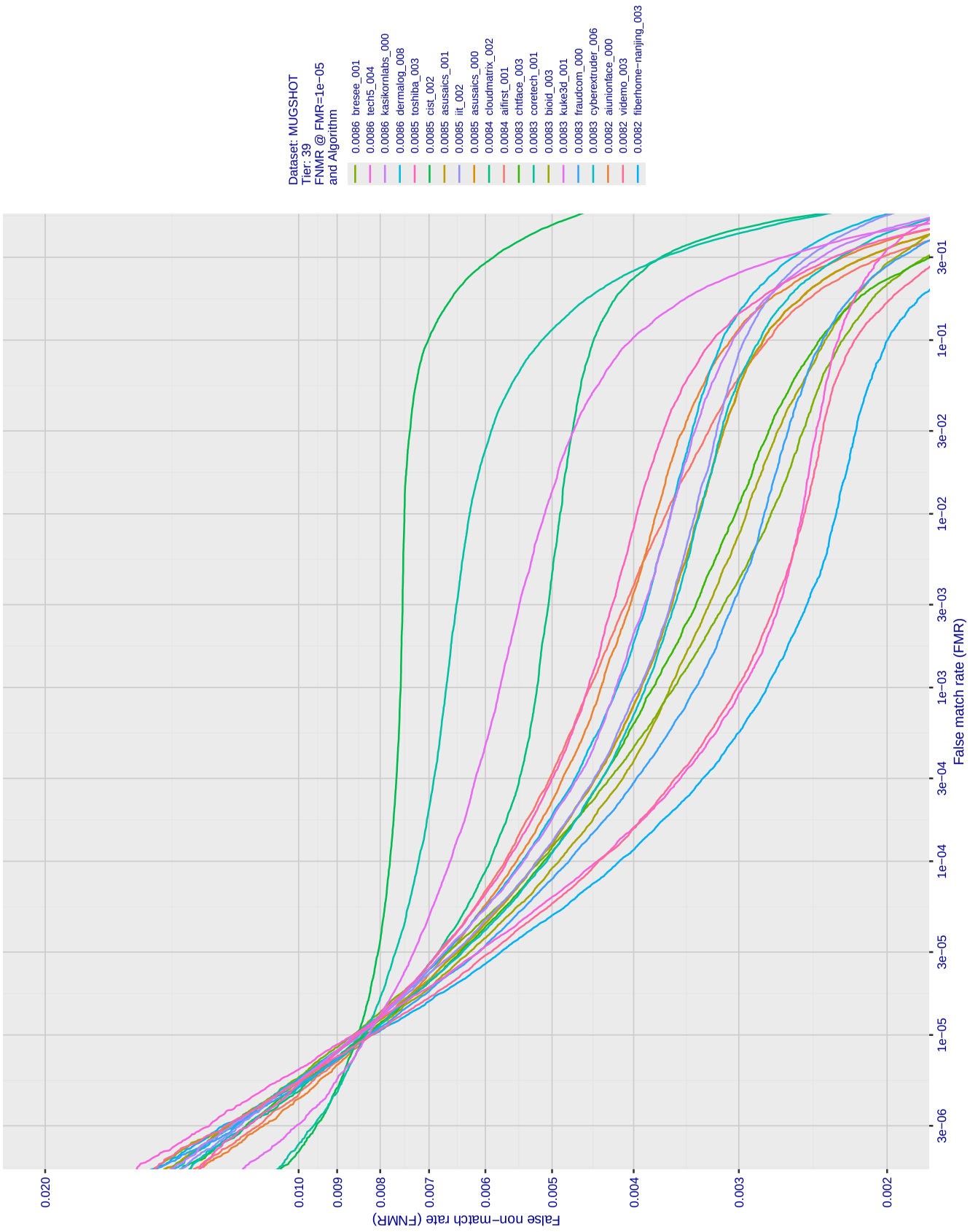

Figure 253: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

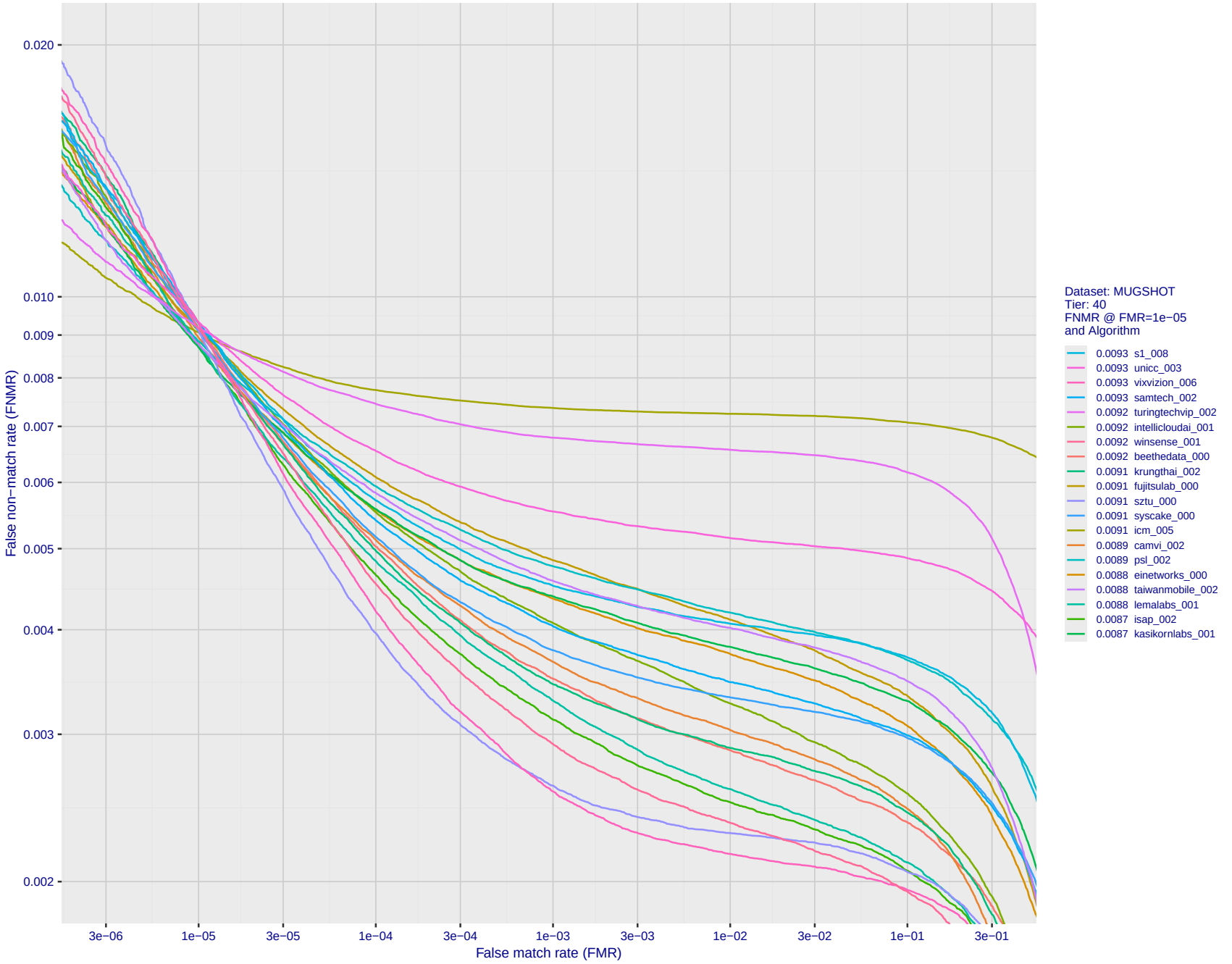

Figure 254: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

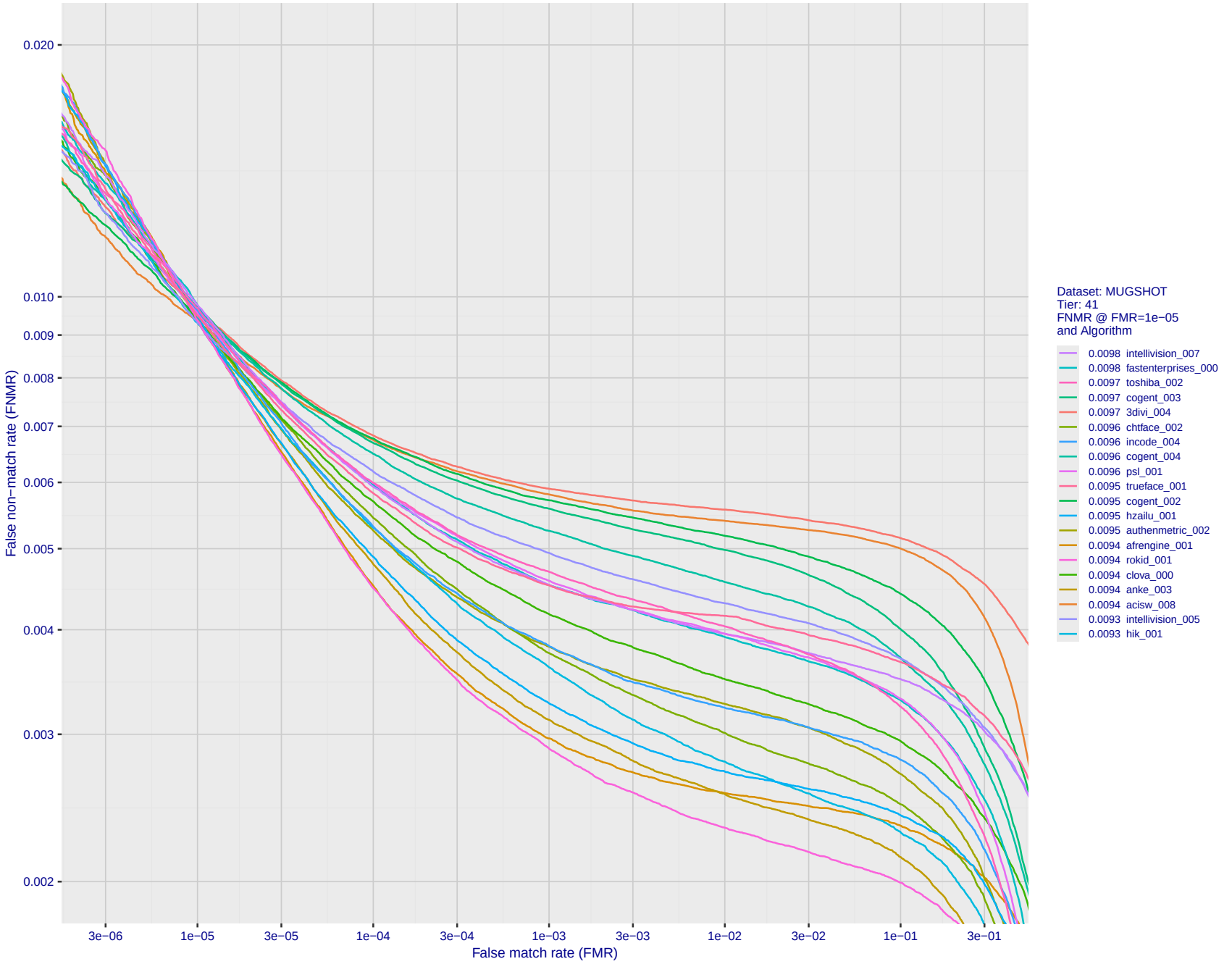

Figure 255: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

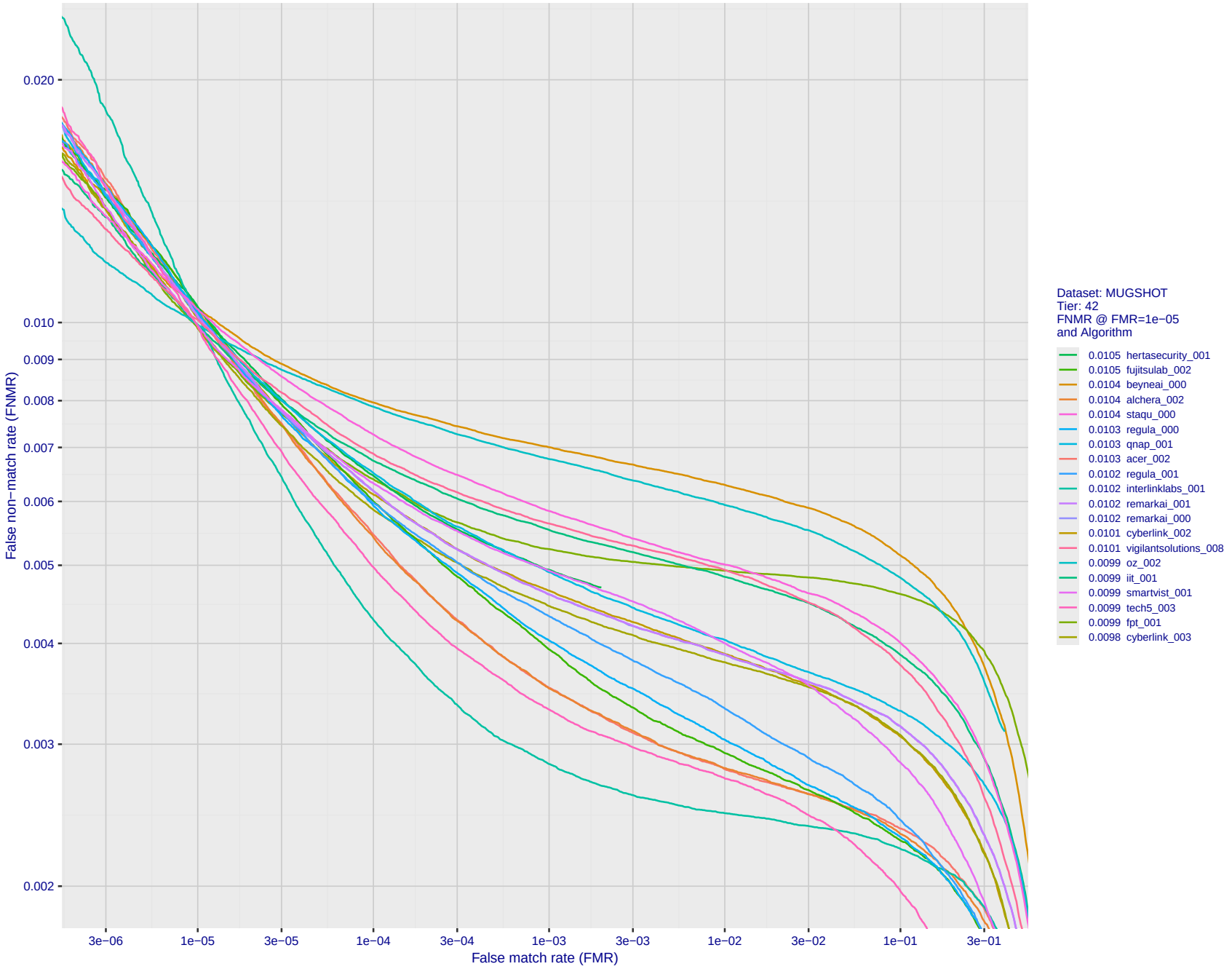

Figure 256: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

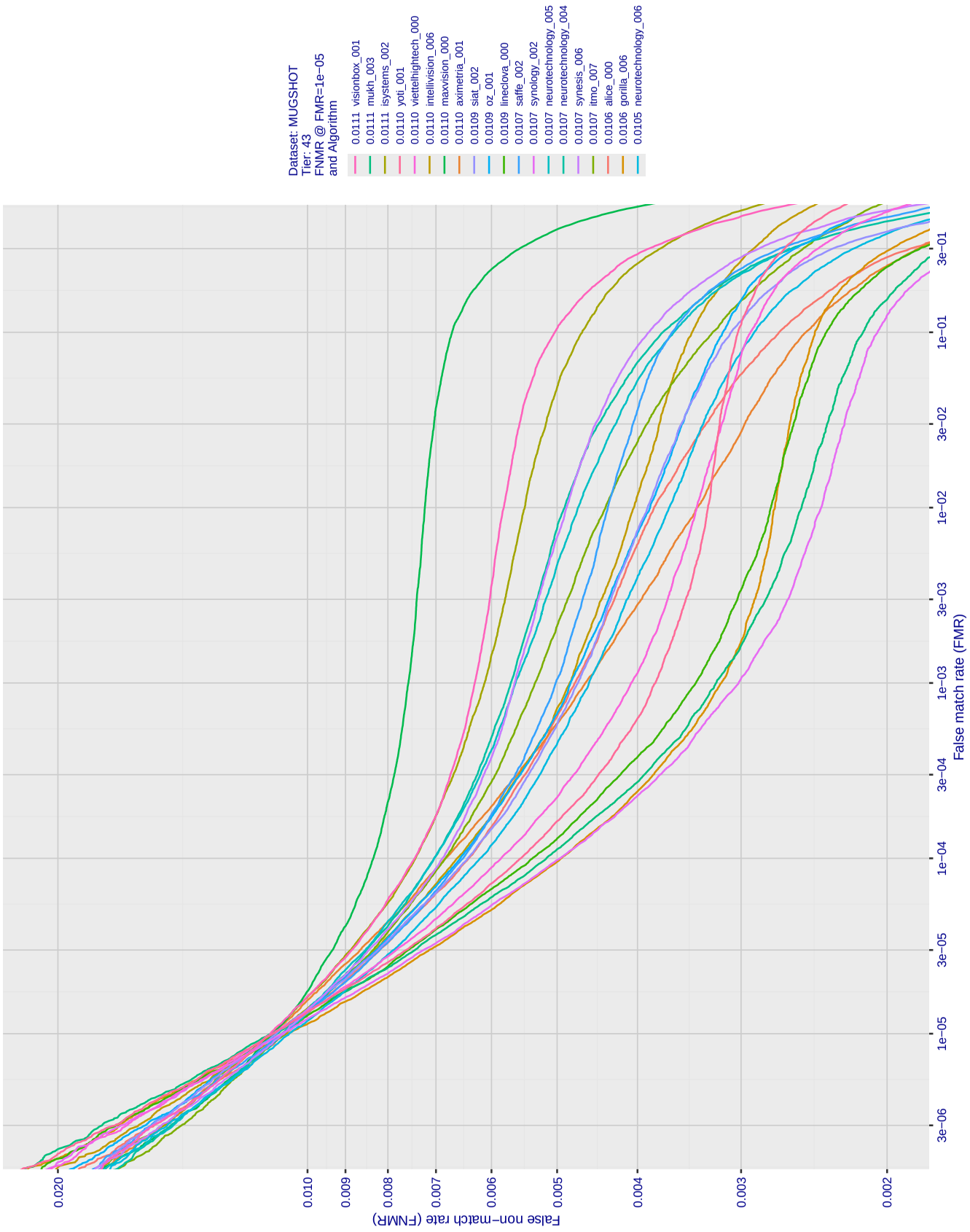

Figure 257: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

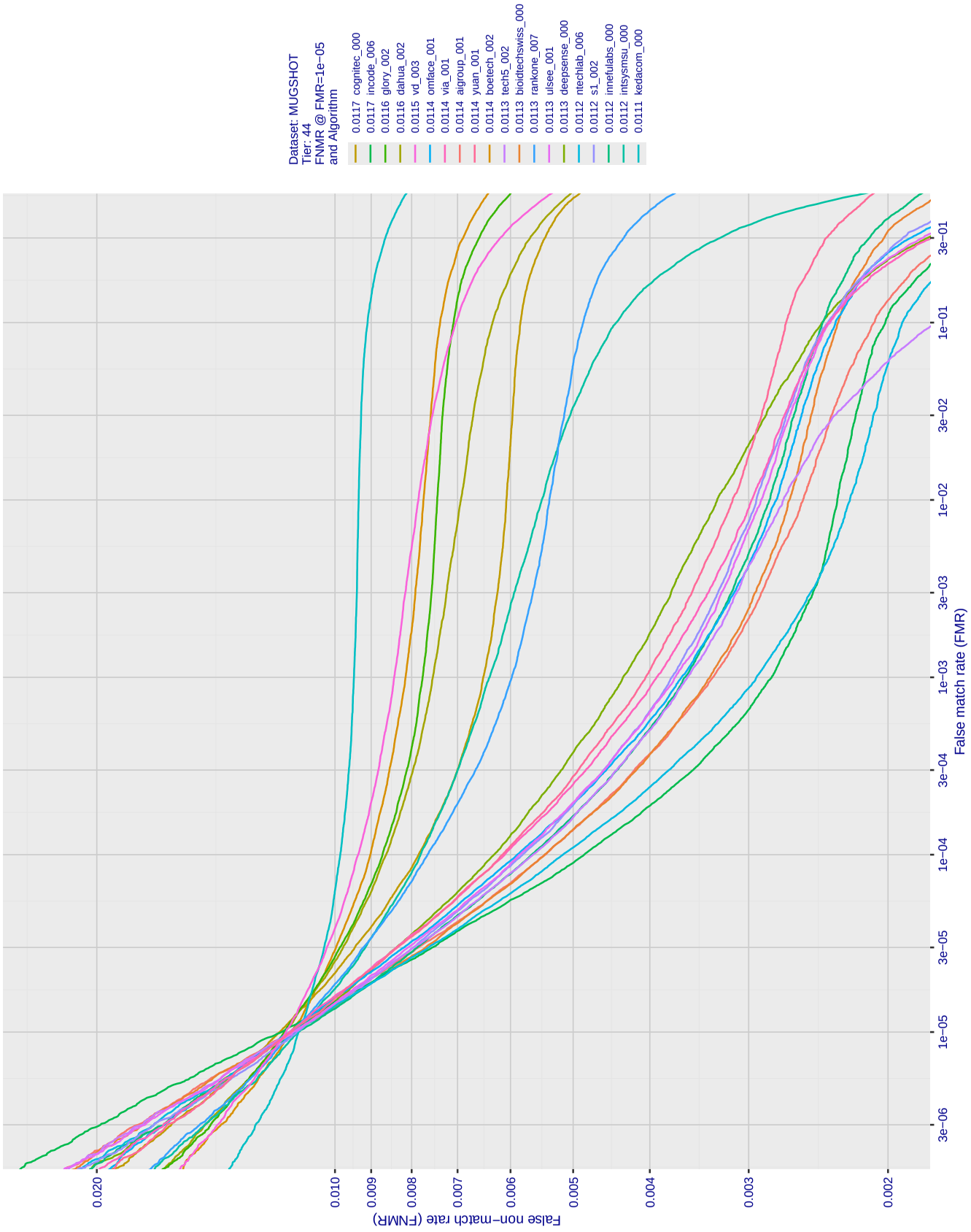

Figure 258: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

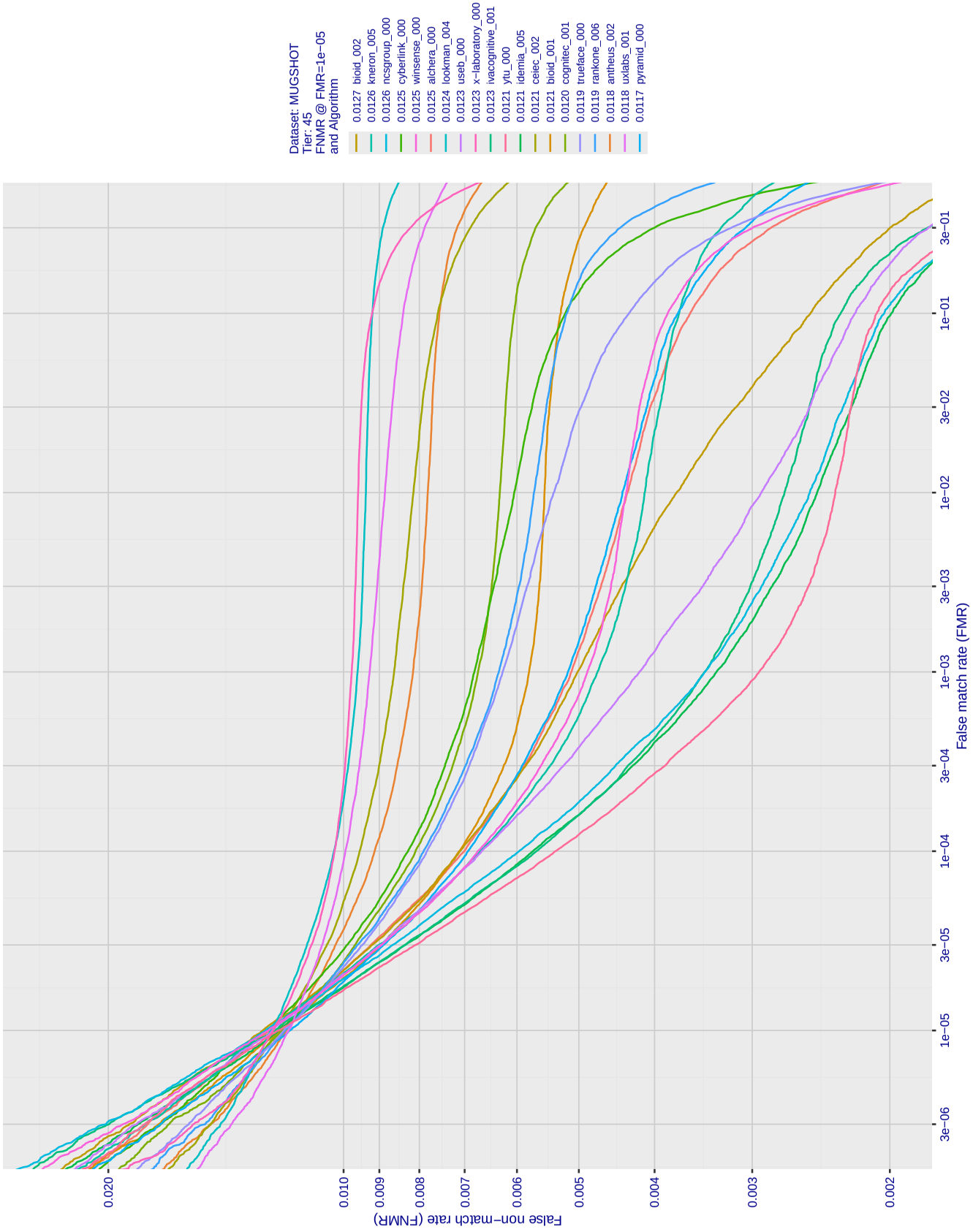

Figure 259: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

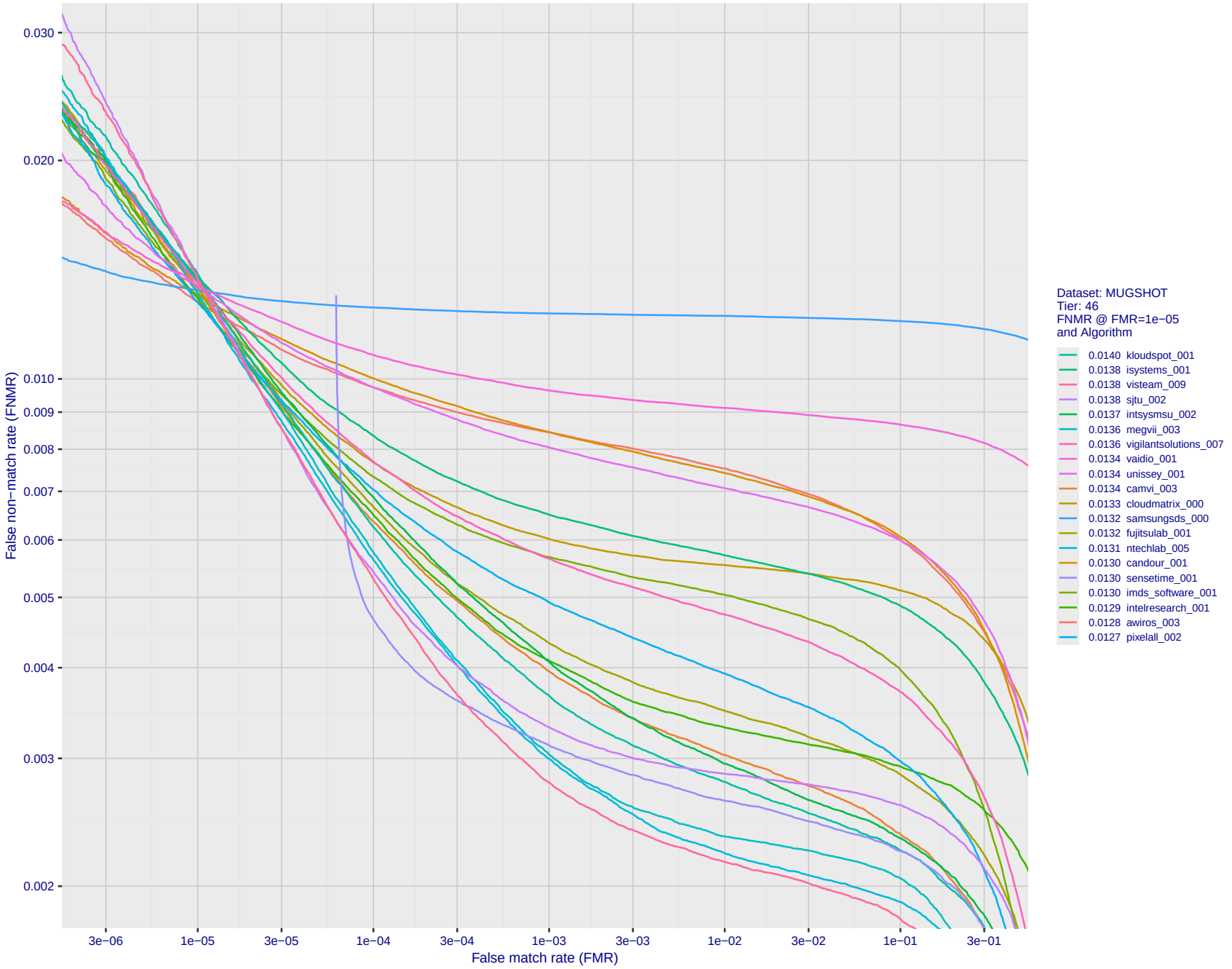

Figure 260: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

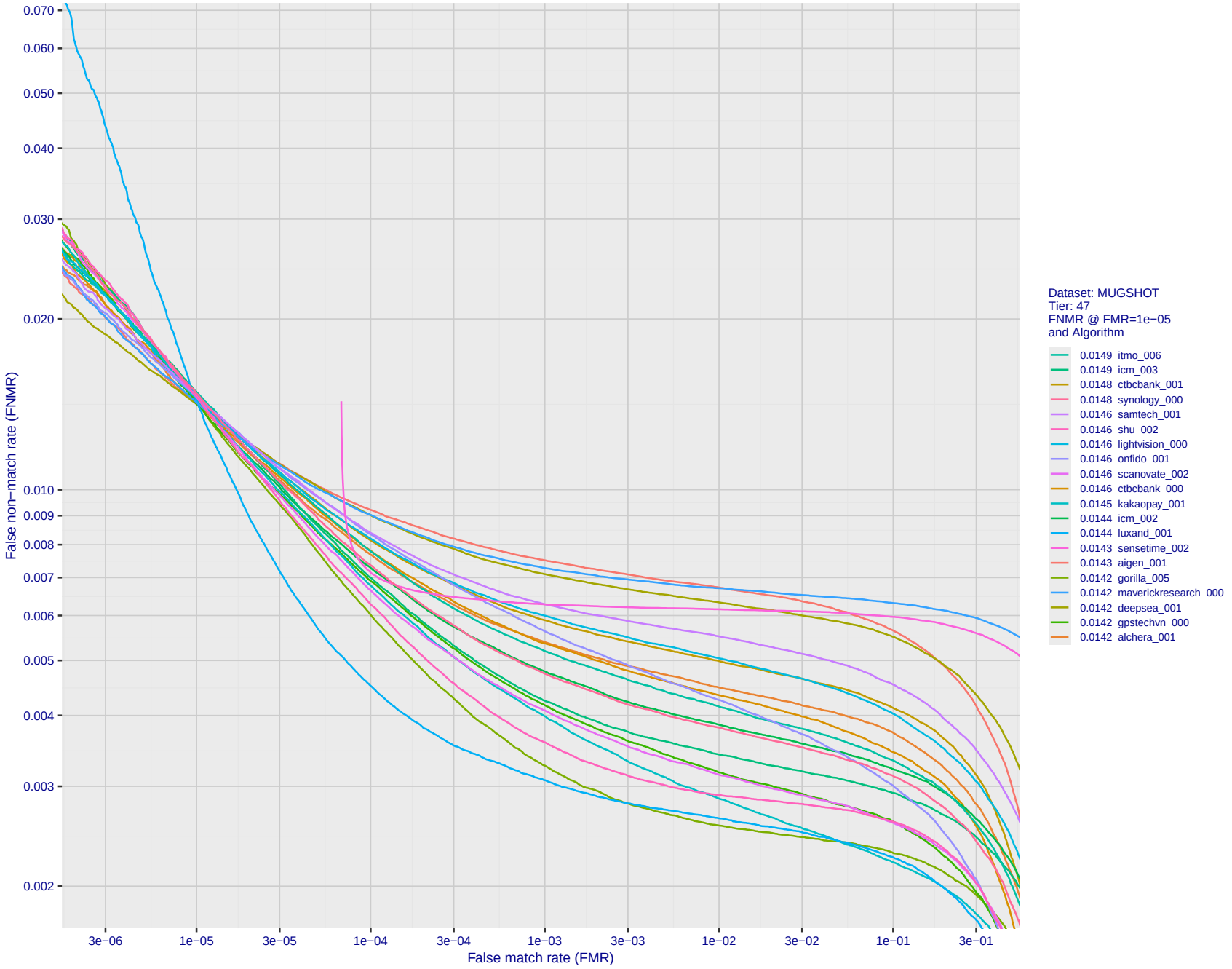

Figure 261: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

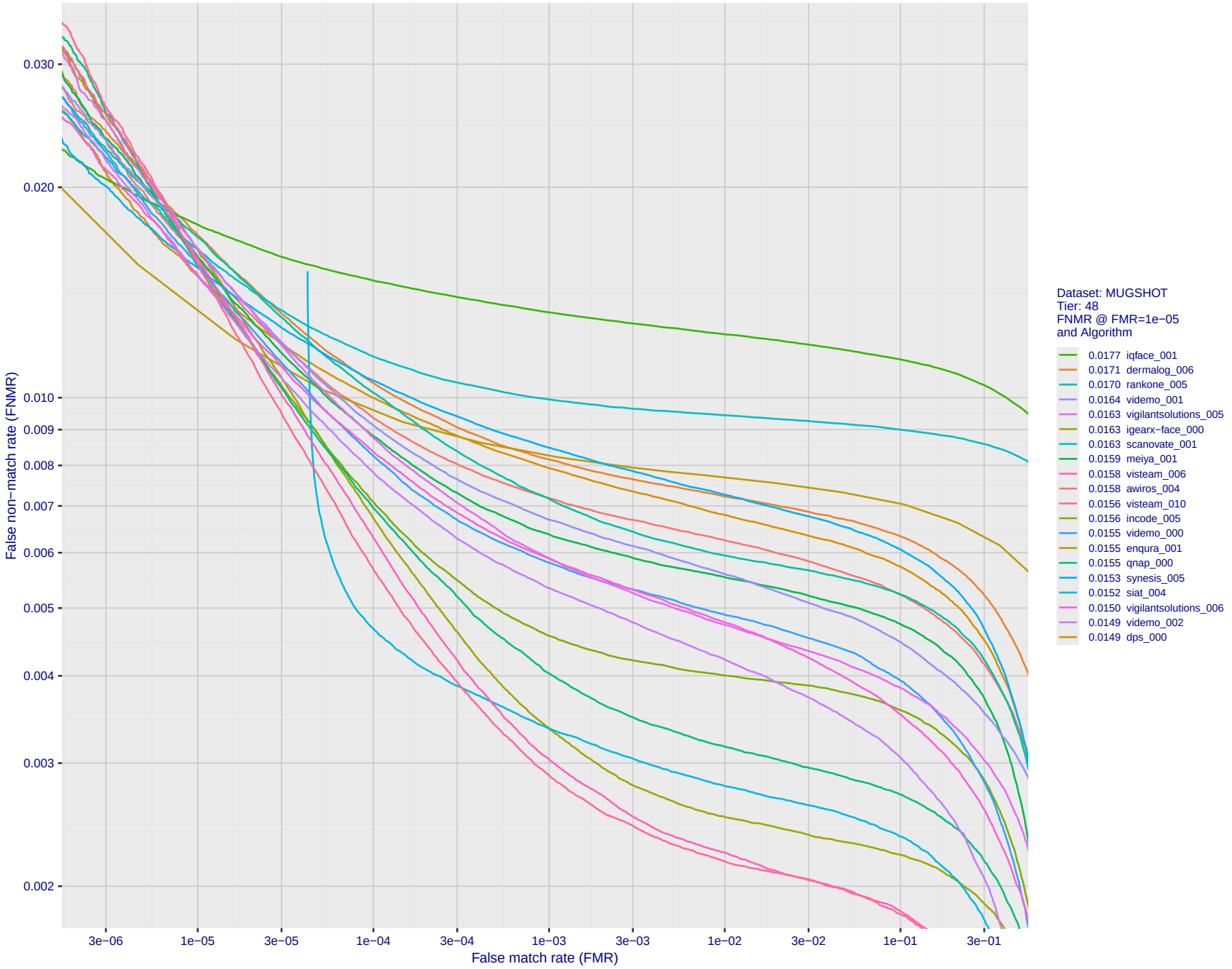

Figure 262: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

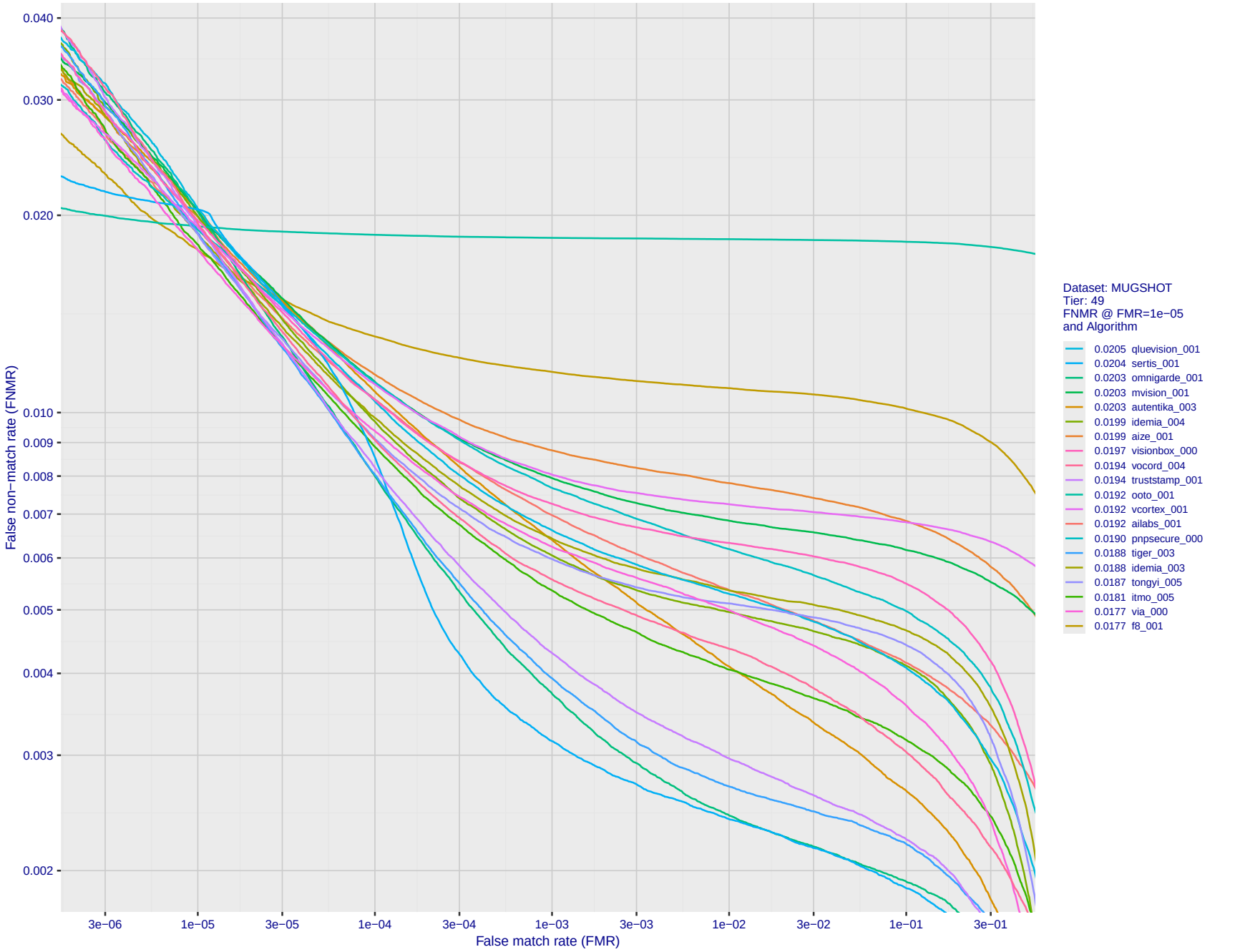

Figure 263: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

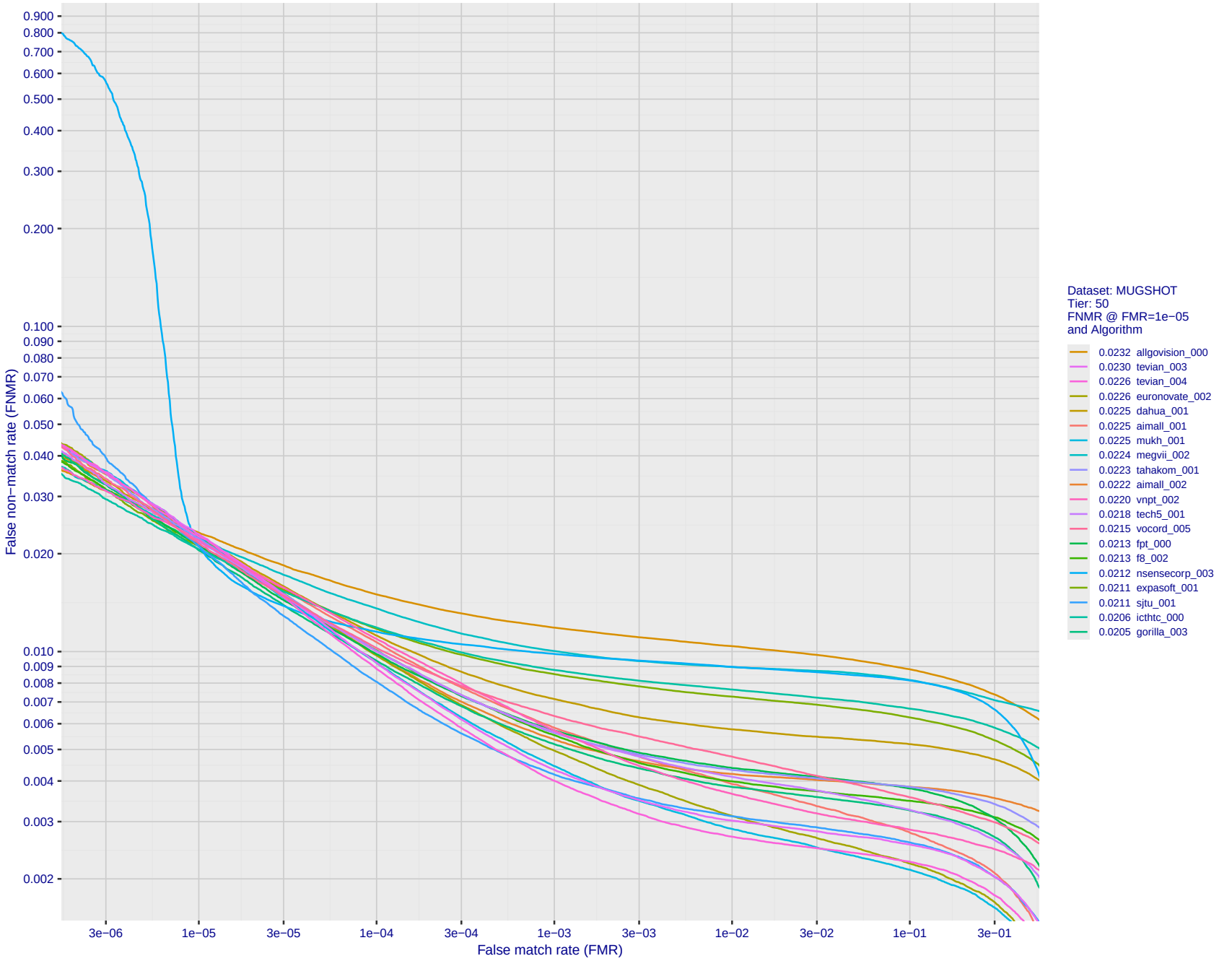

*Figure 264: For the mugshot images, detection error tradeoff (*DET*) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of* FMR*.*

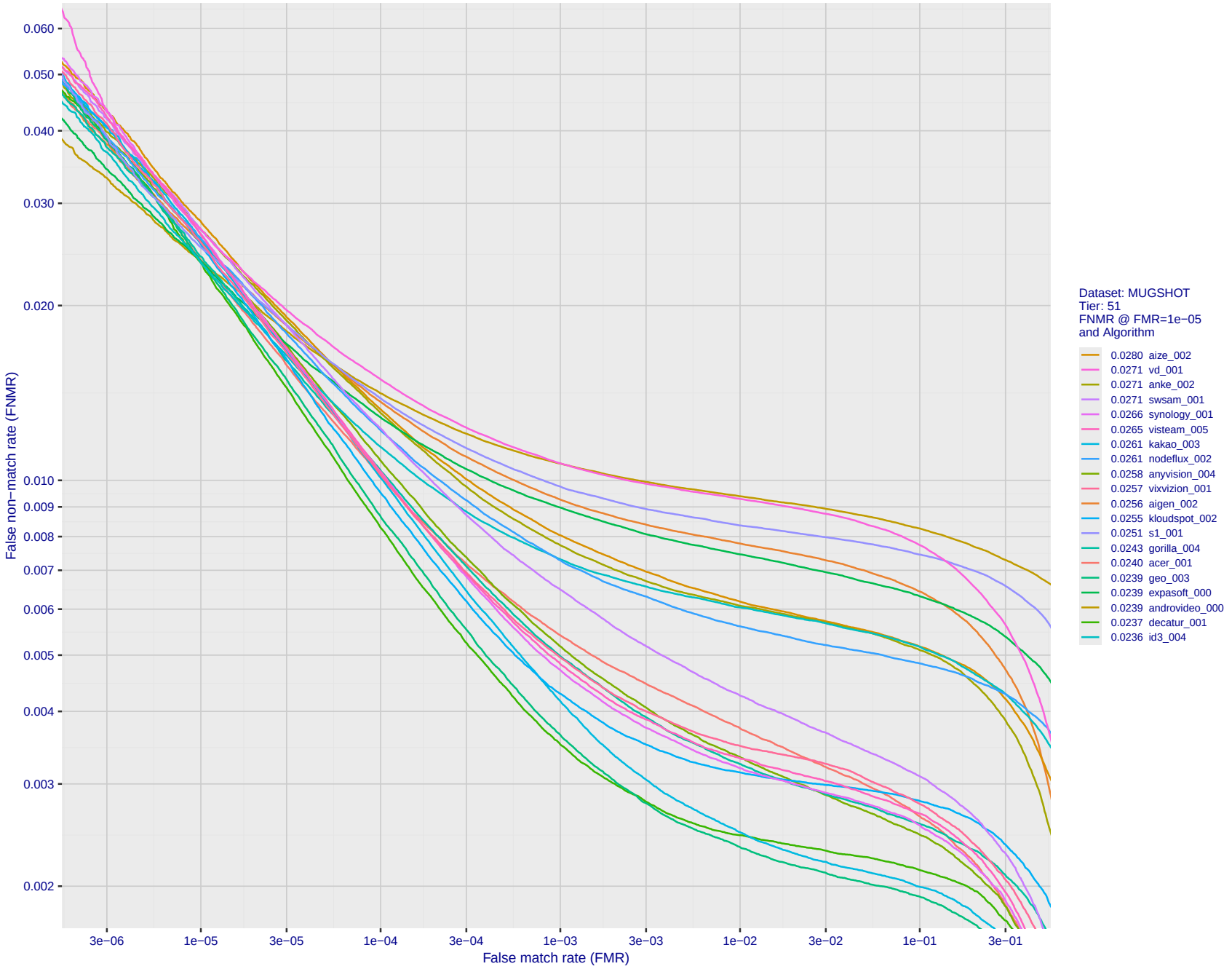

Figure 265: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

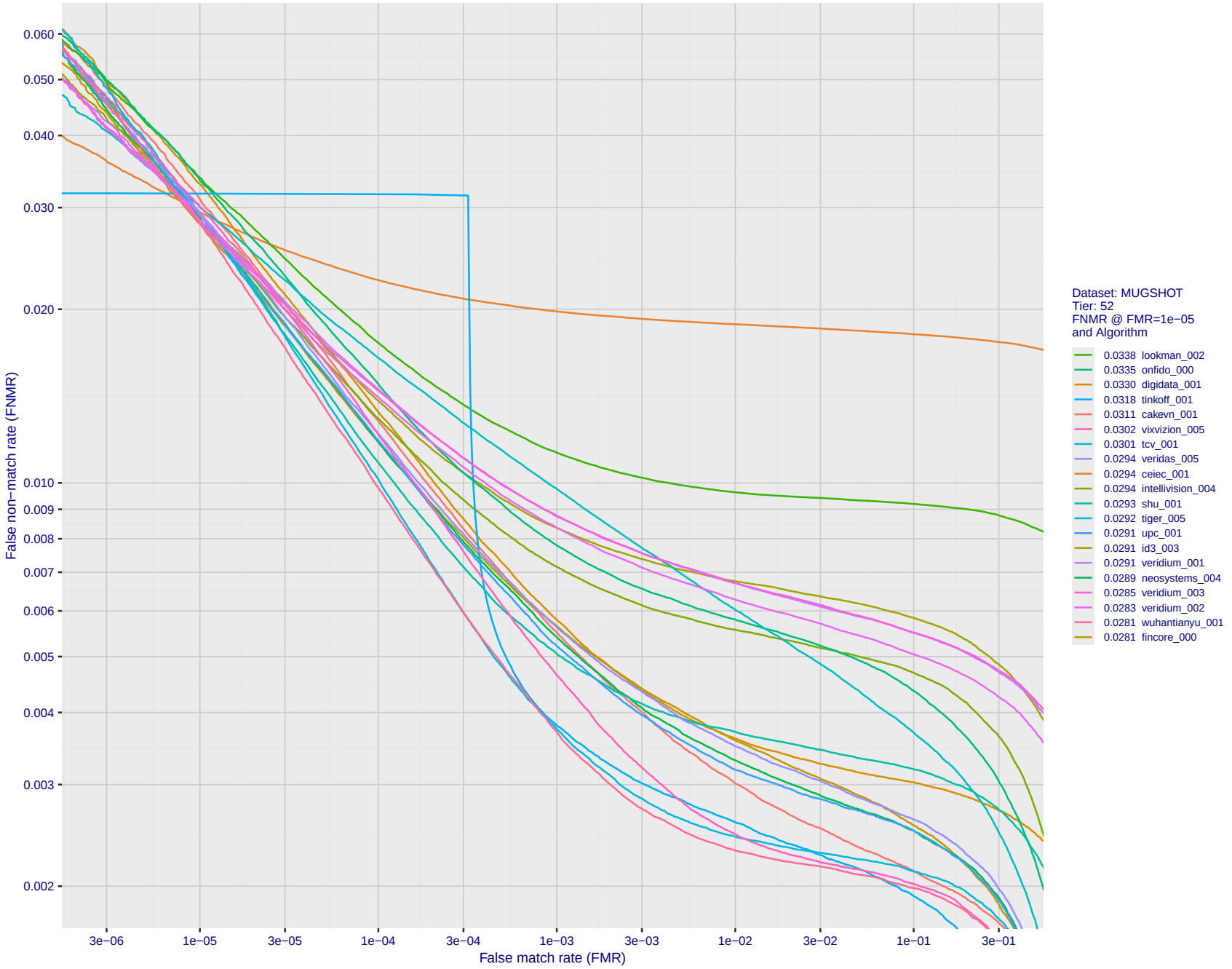

Figure 266: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

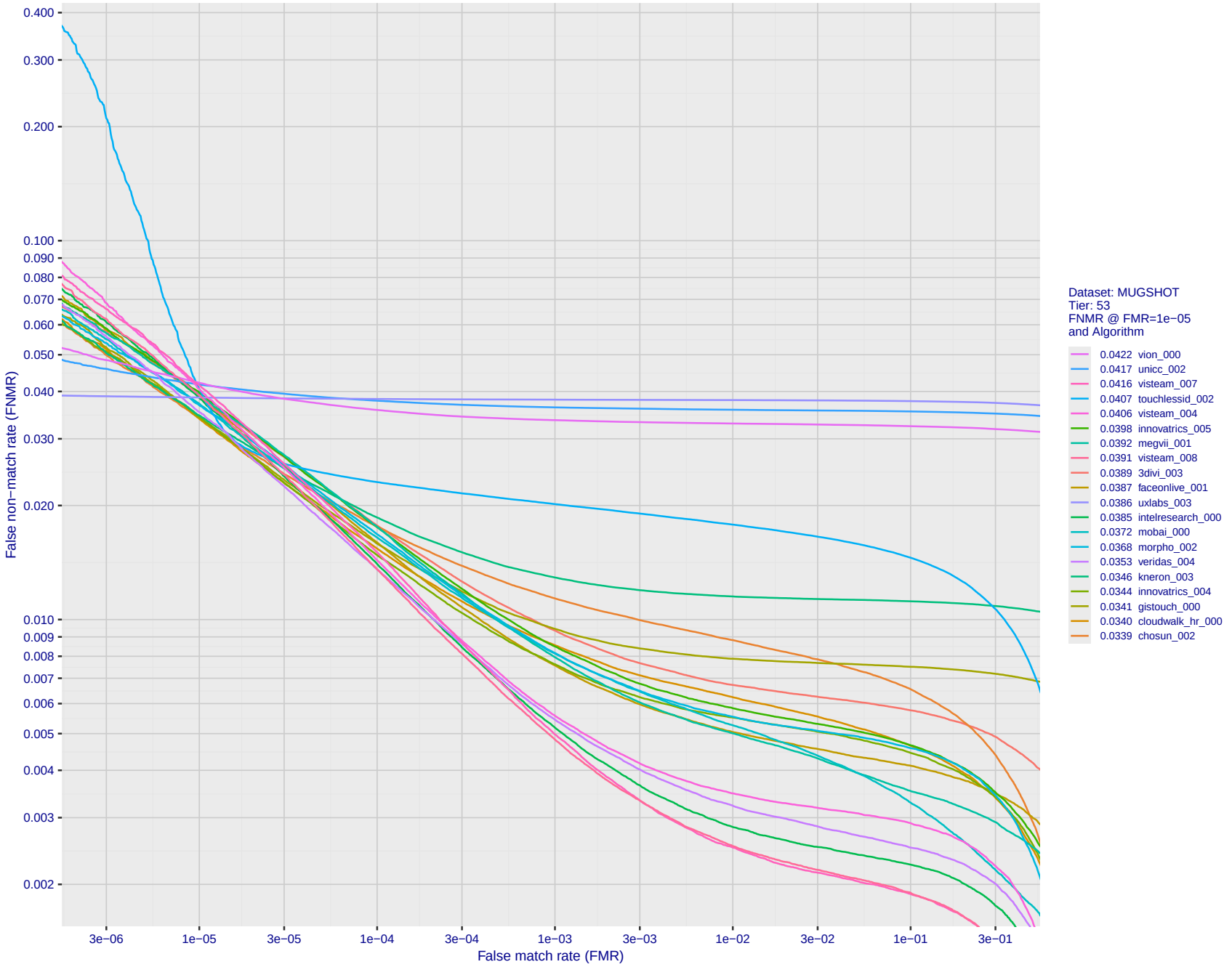

Figure 267: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

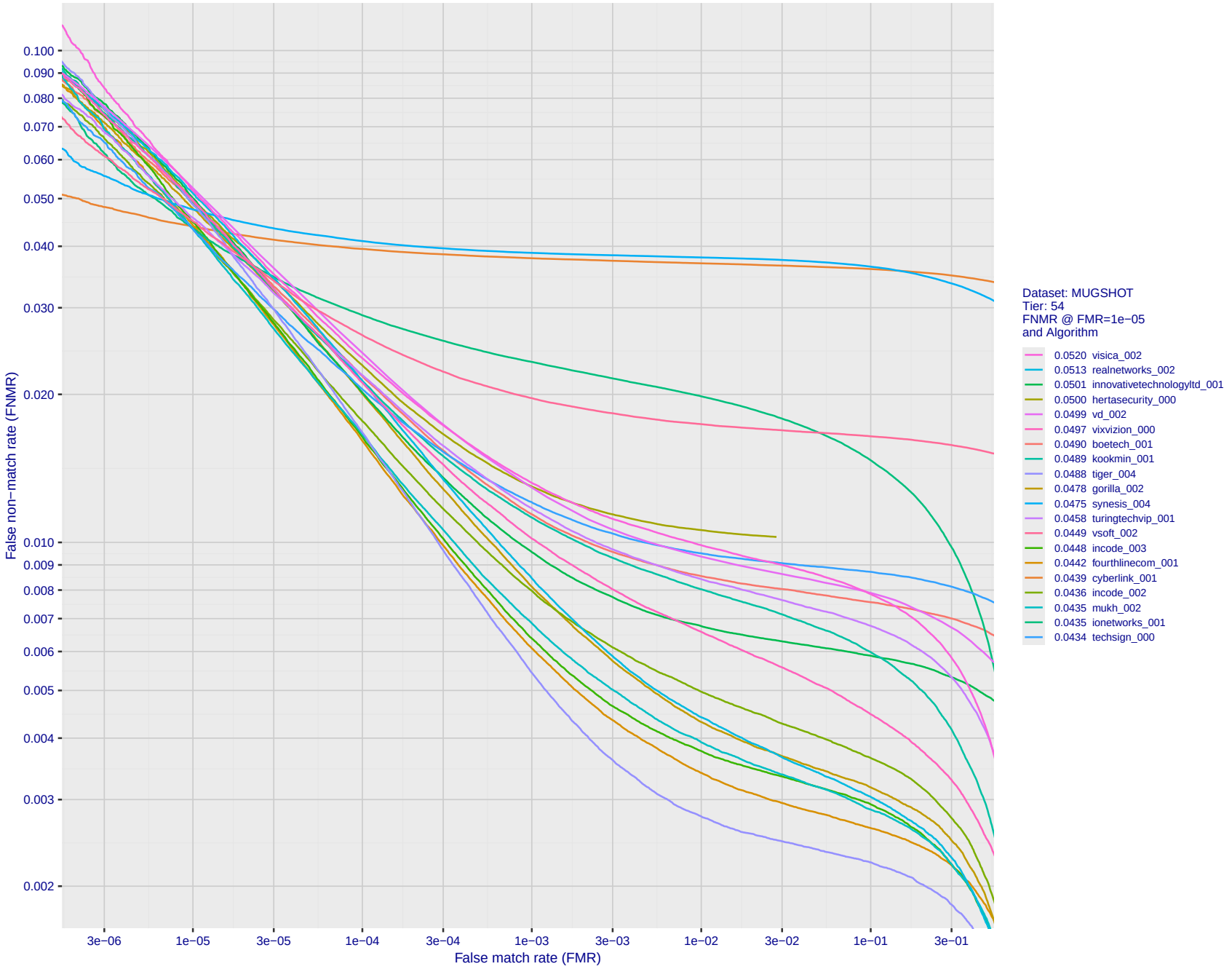

Figure 268: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

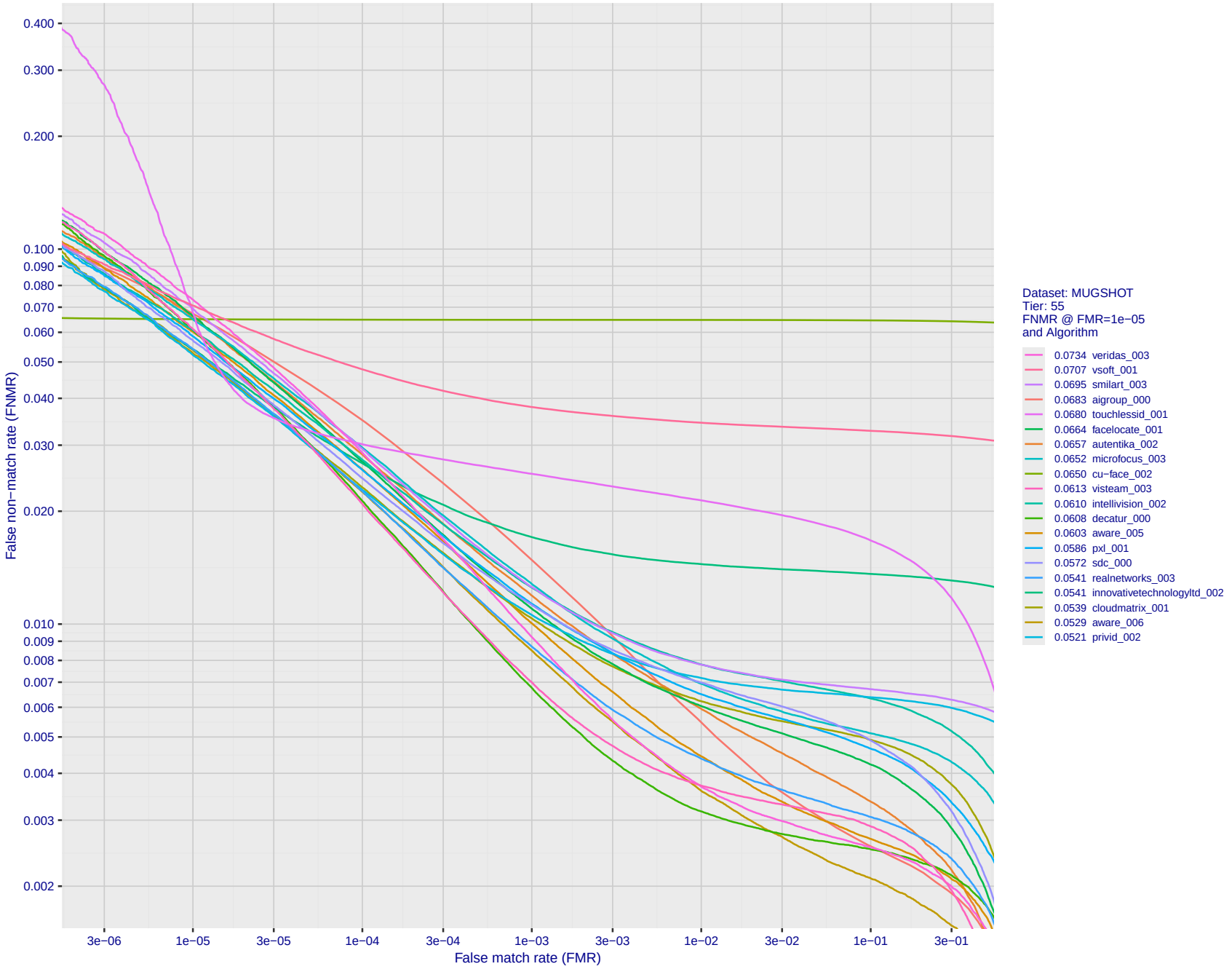

Figure 269: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

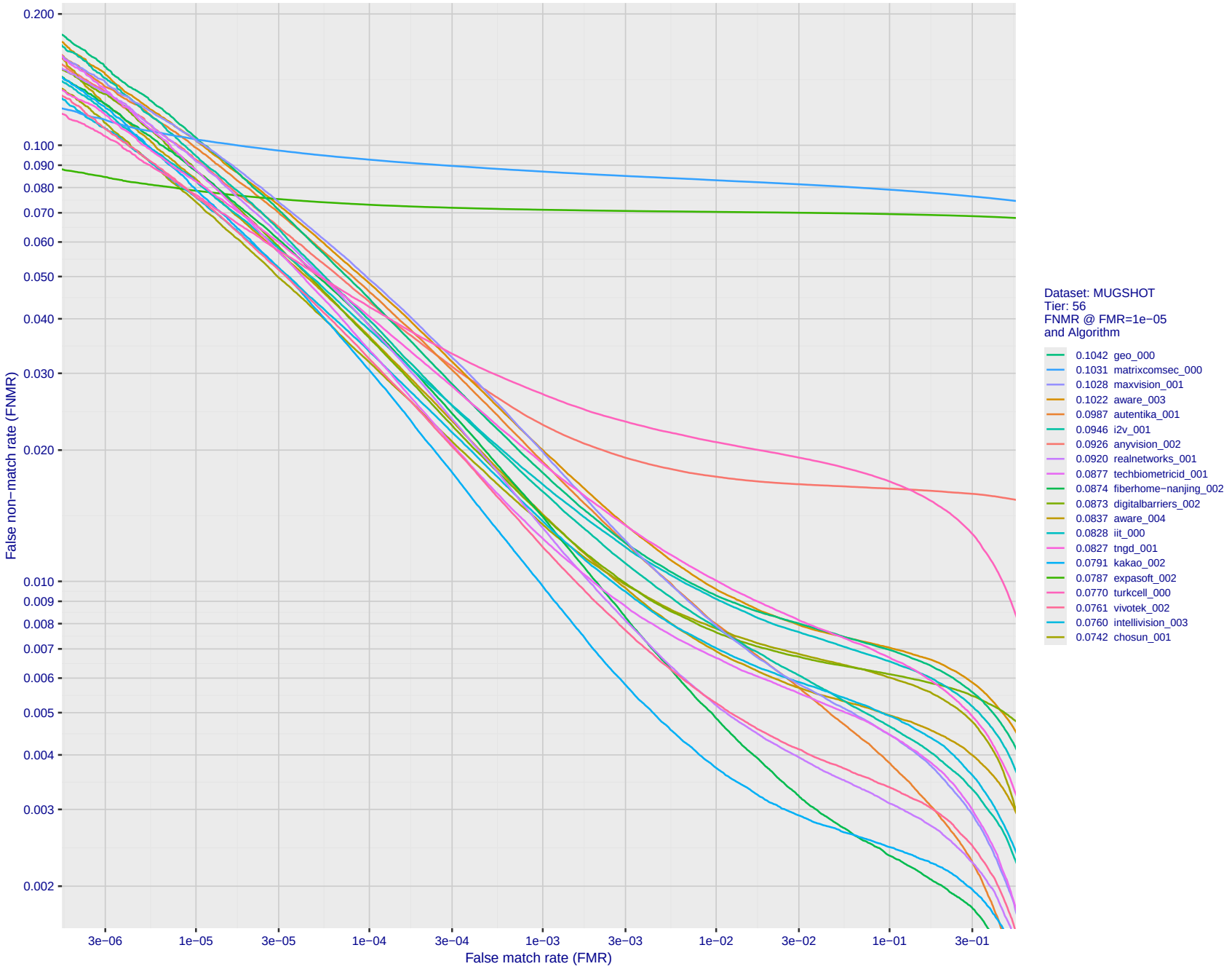

Figure 270: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

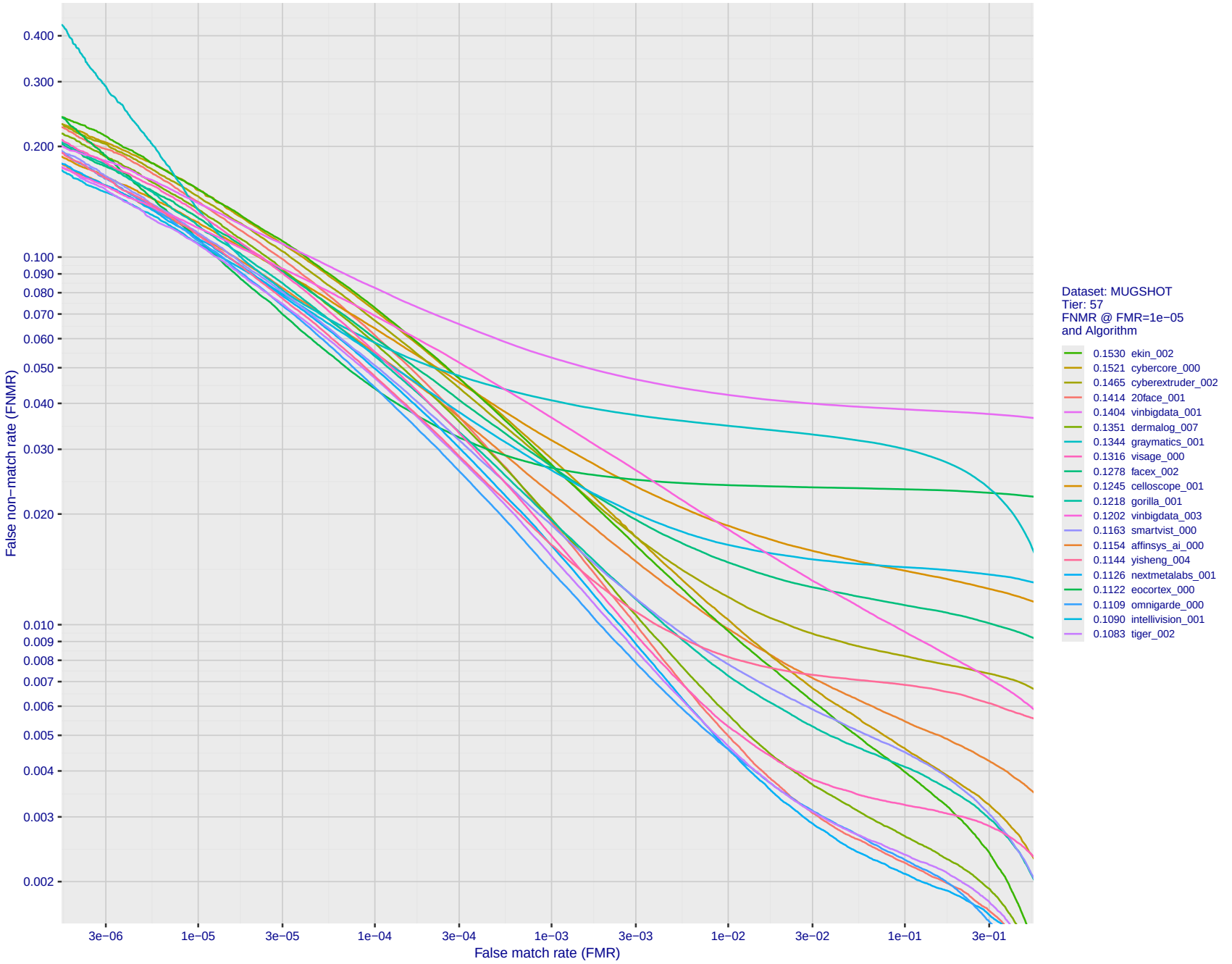

Figure 271: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

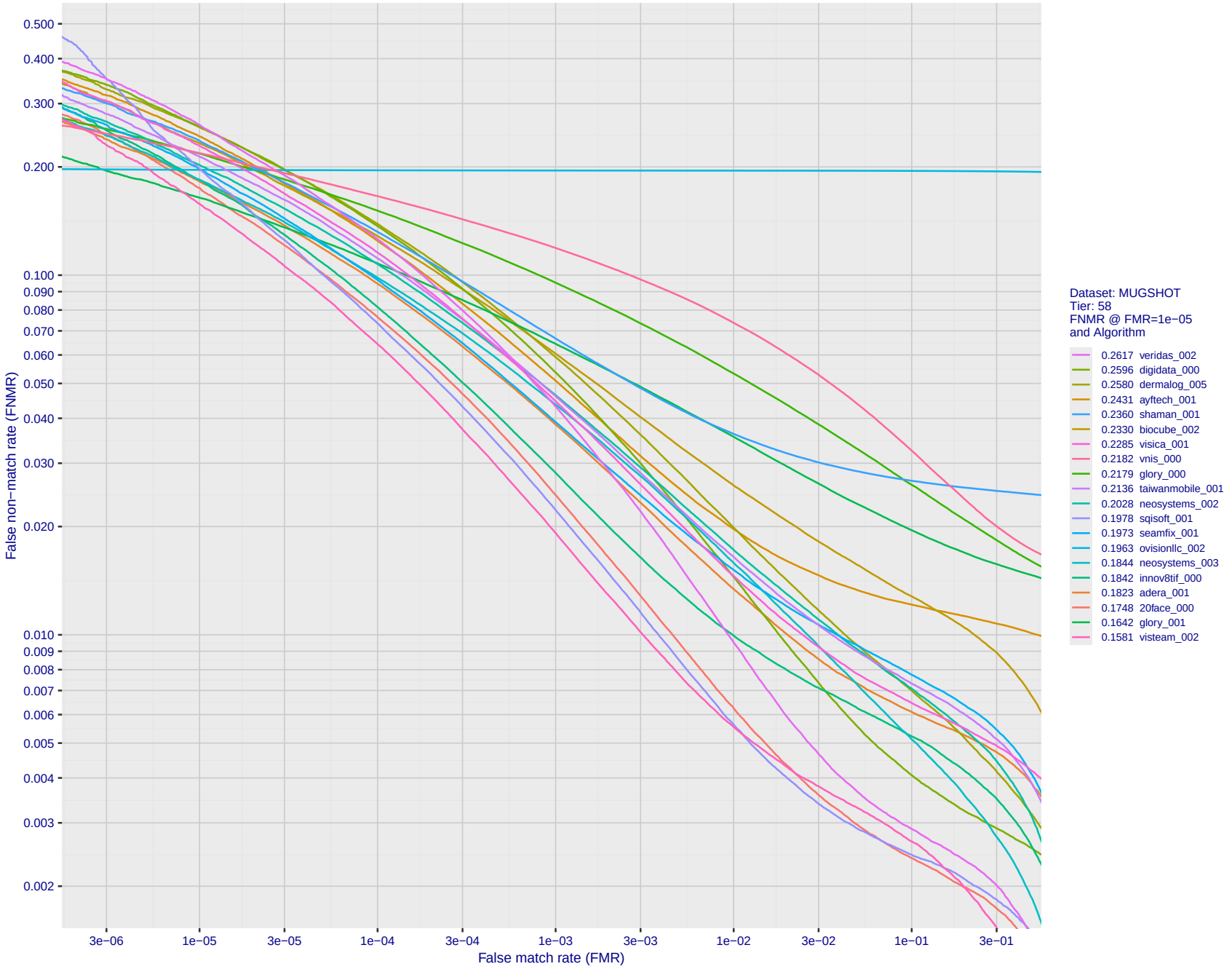

Figure 272: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

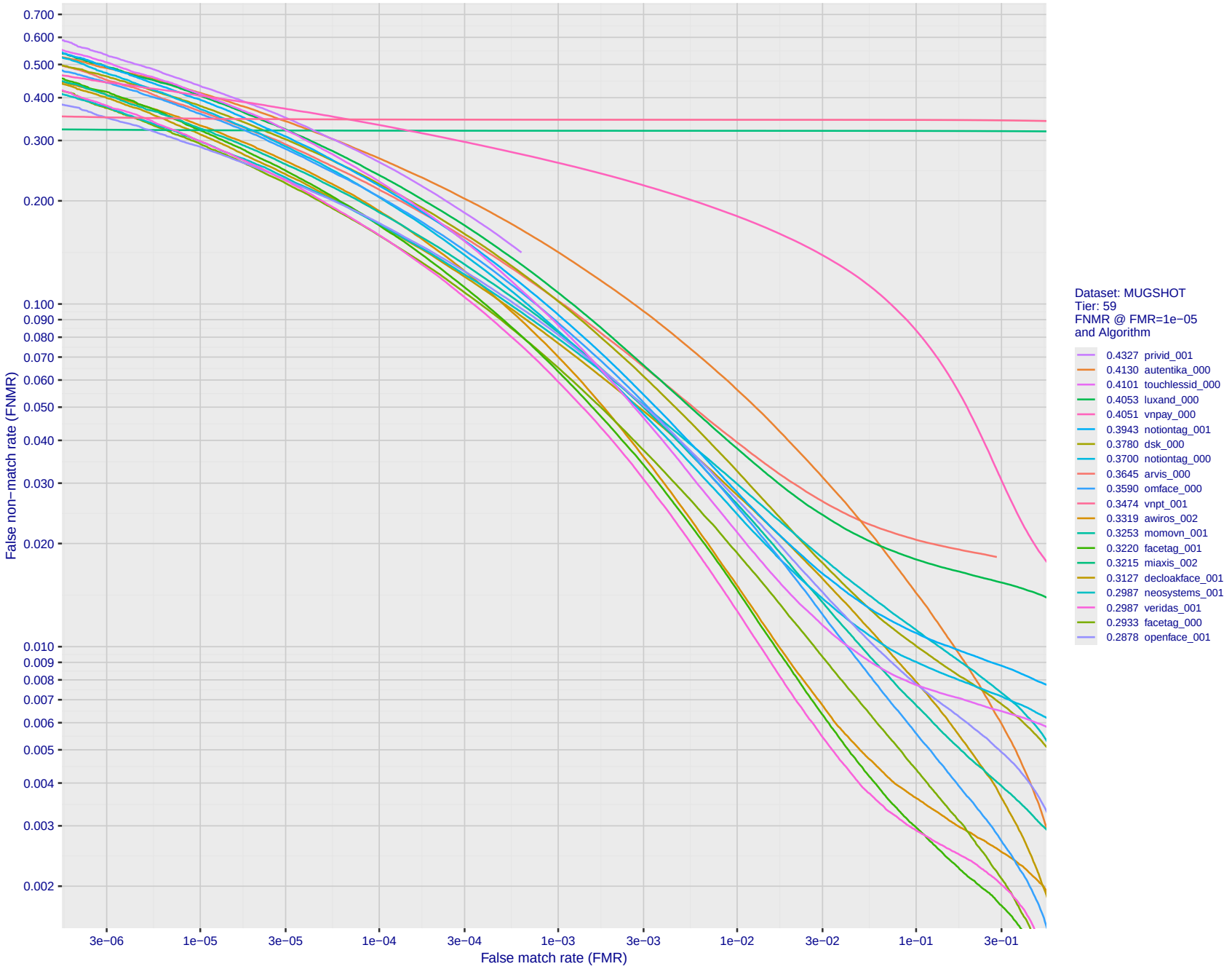

Figure 273: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

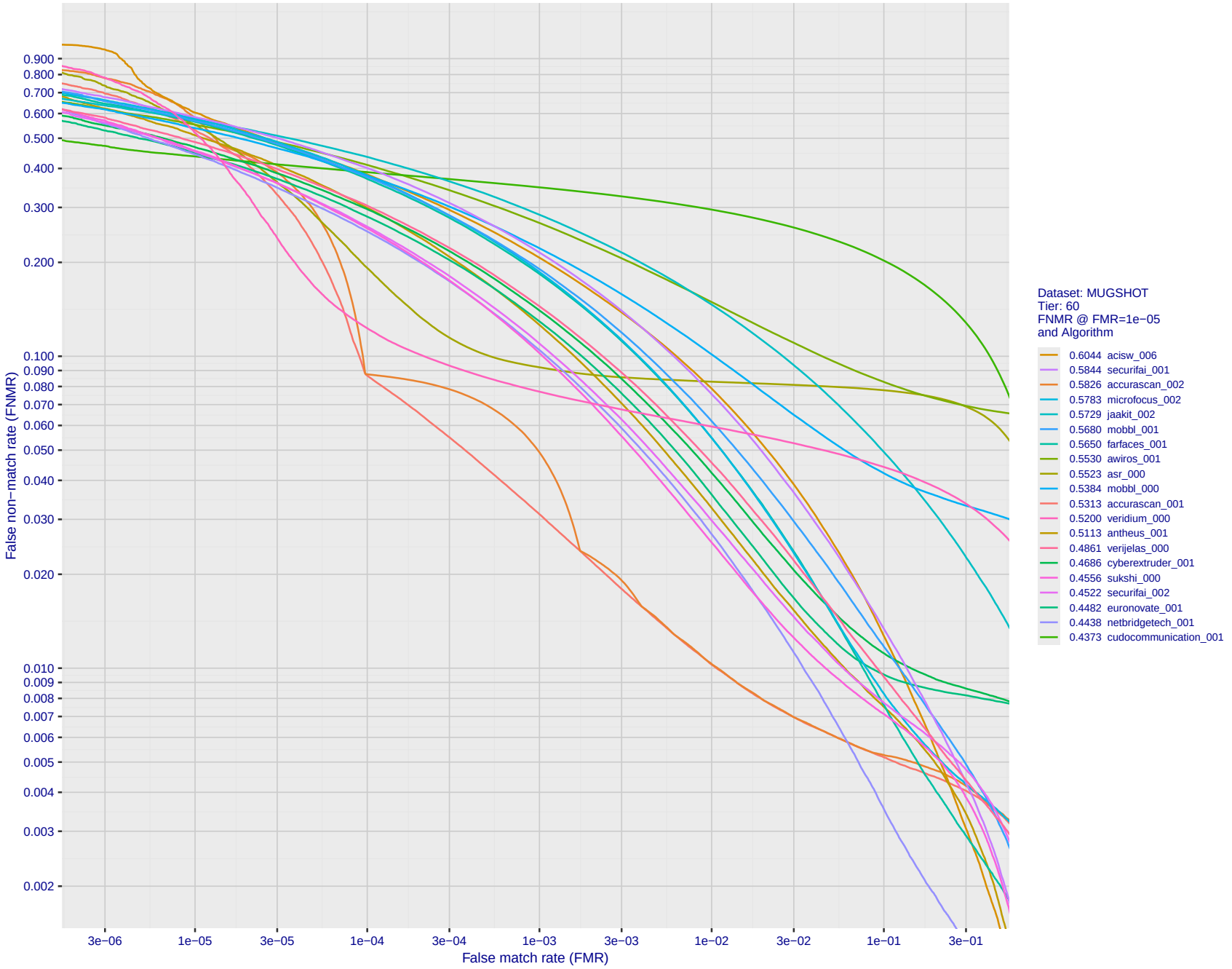

Figure 274: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

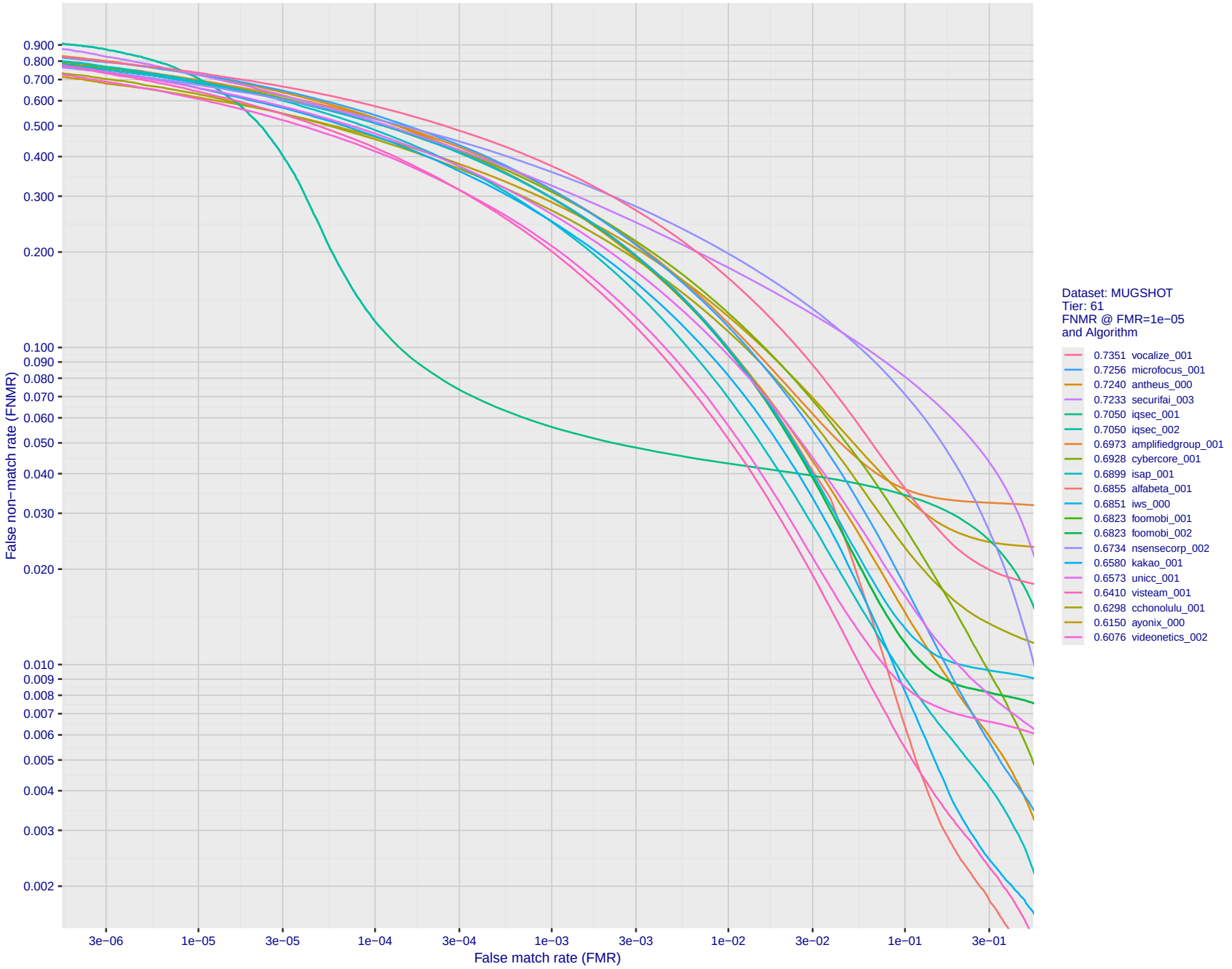

Figure 275: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

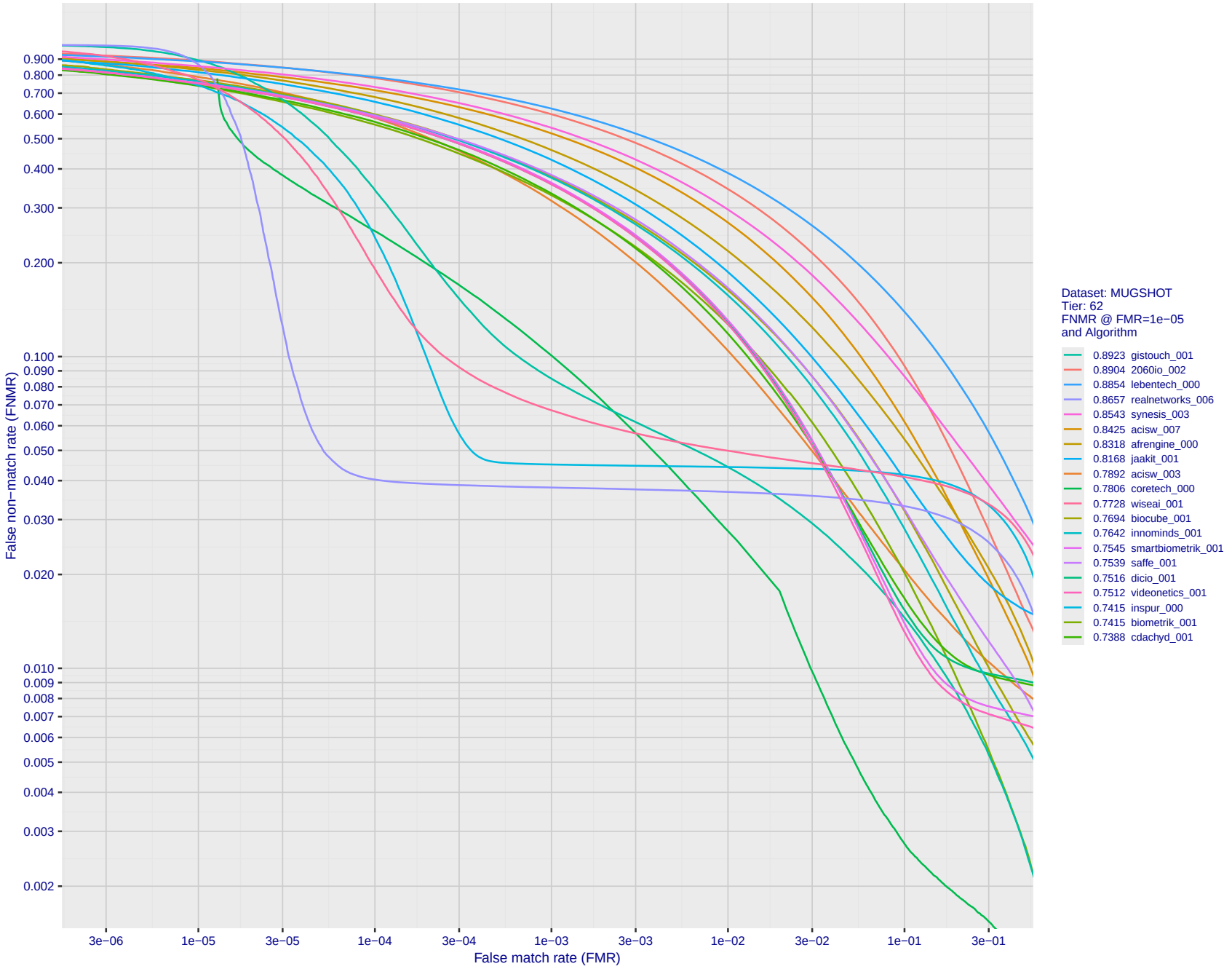

Figure 276: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

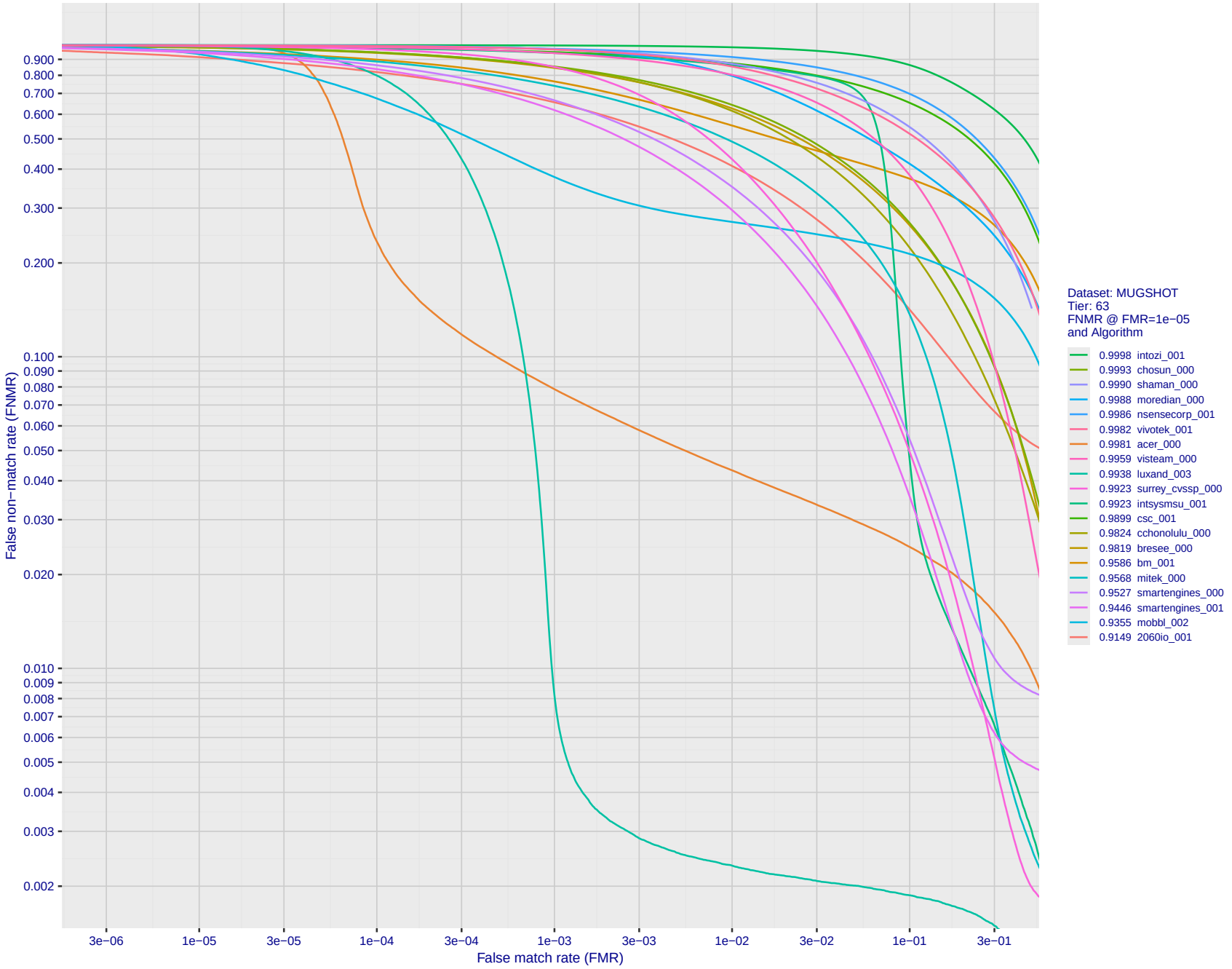

Figure 277: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

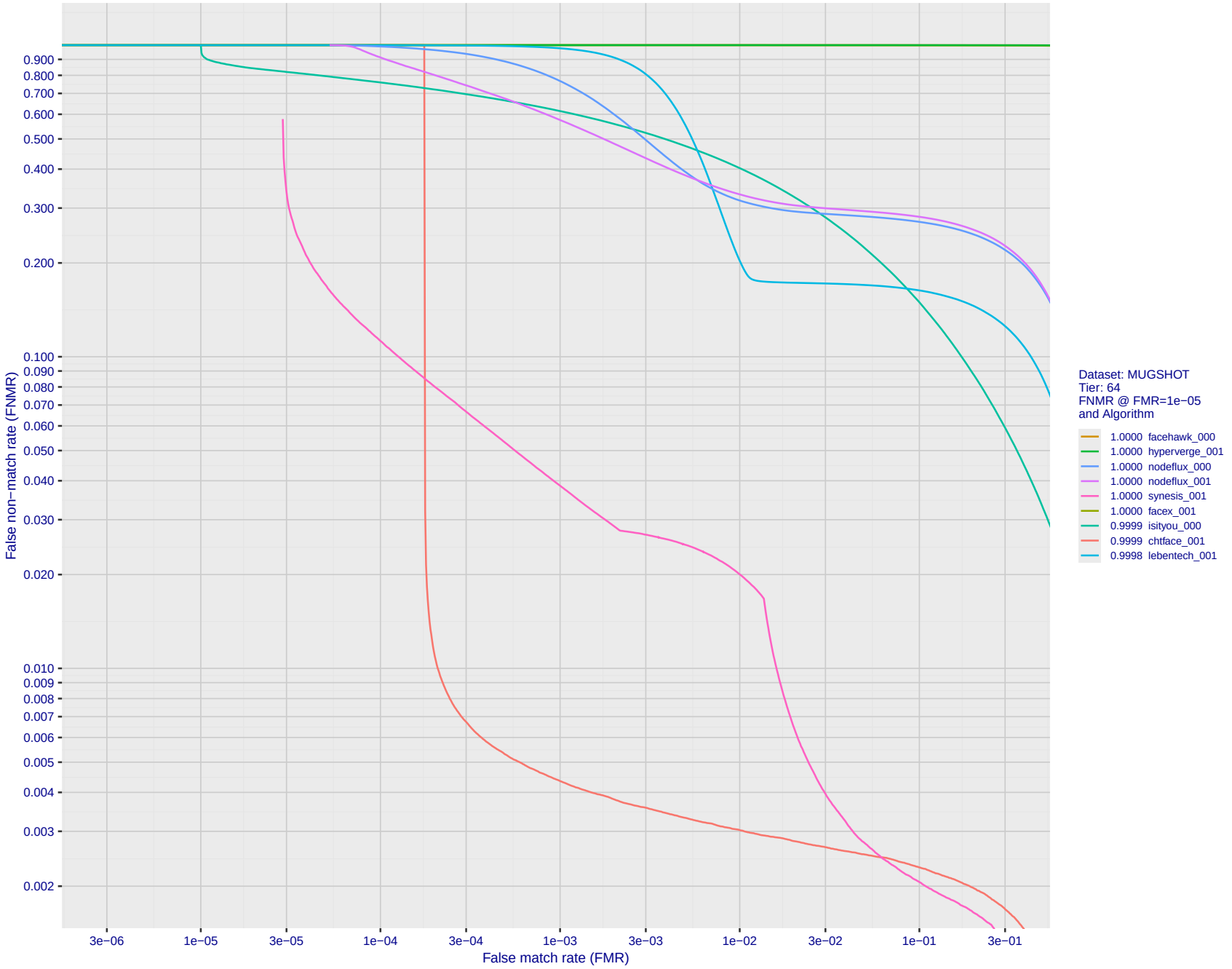

Figure 278: For the mugshot images, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

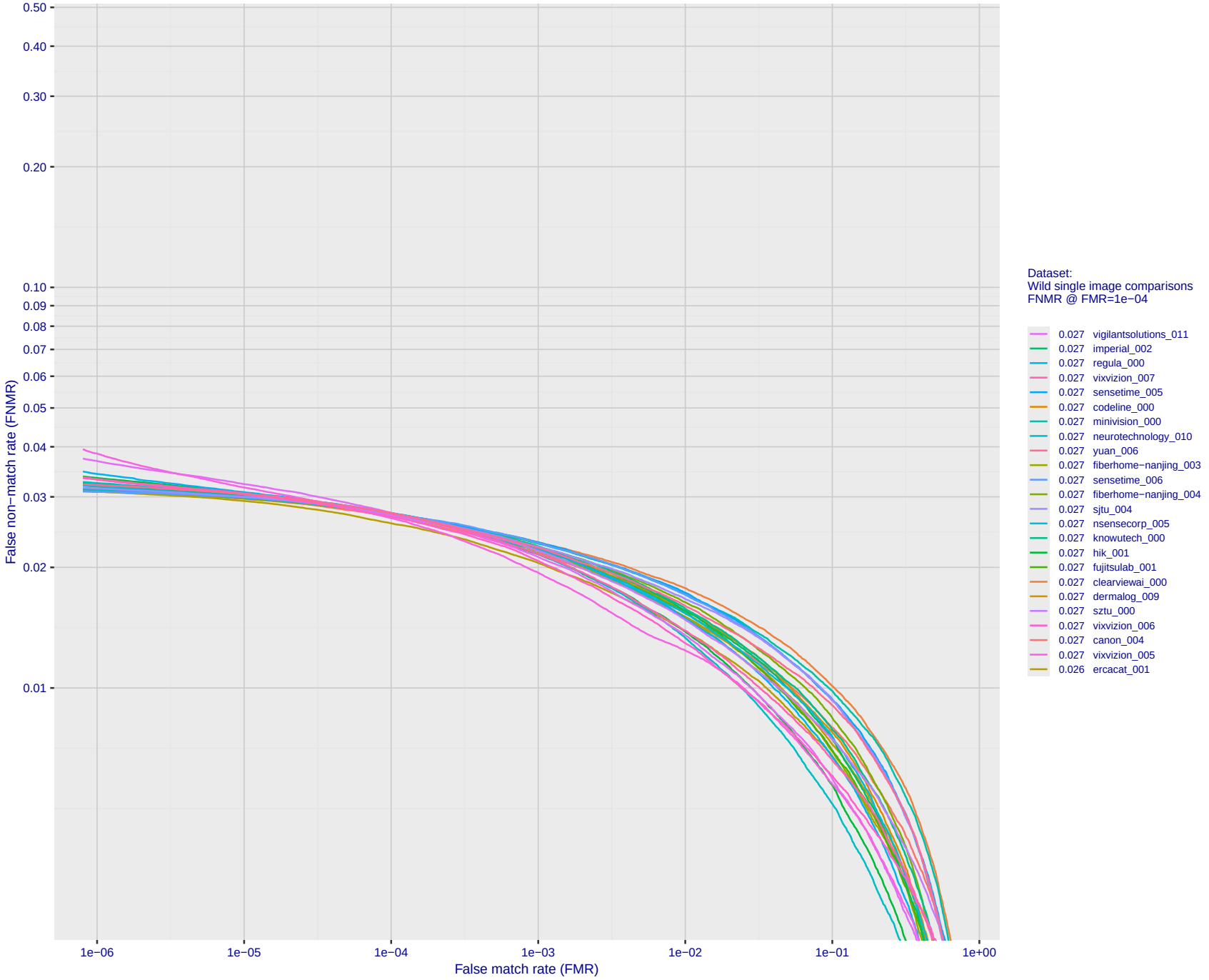

Figure 279: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate"
FMR(T) "False match rate"

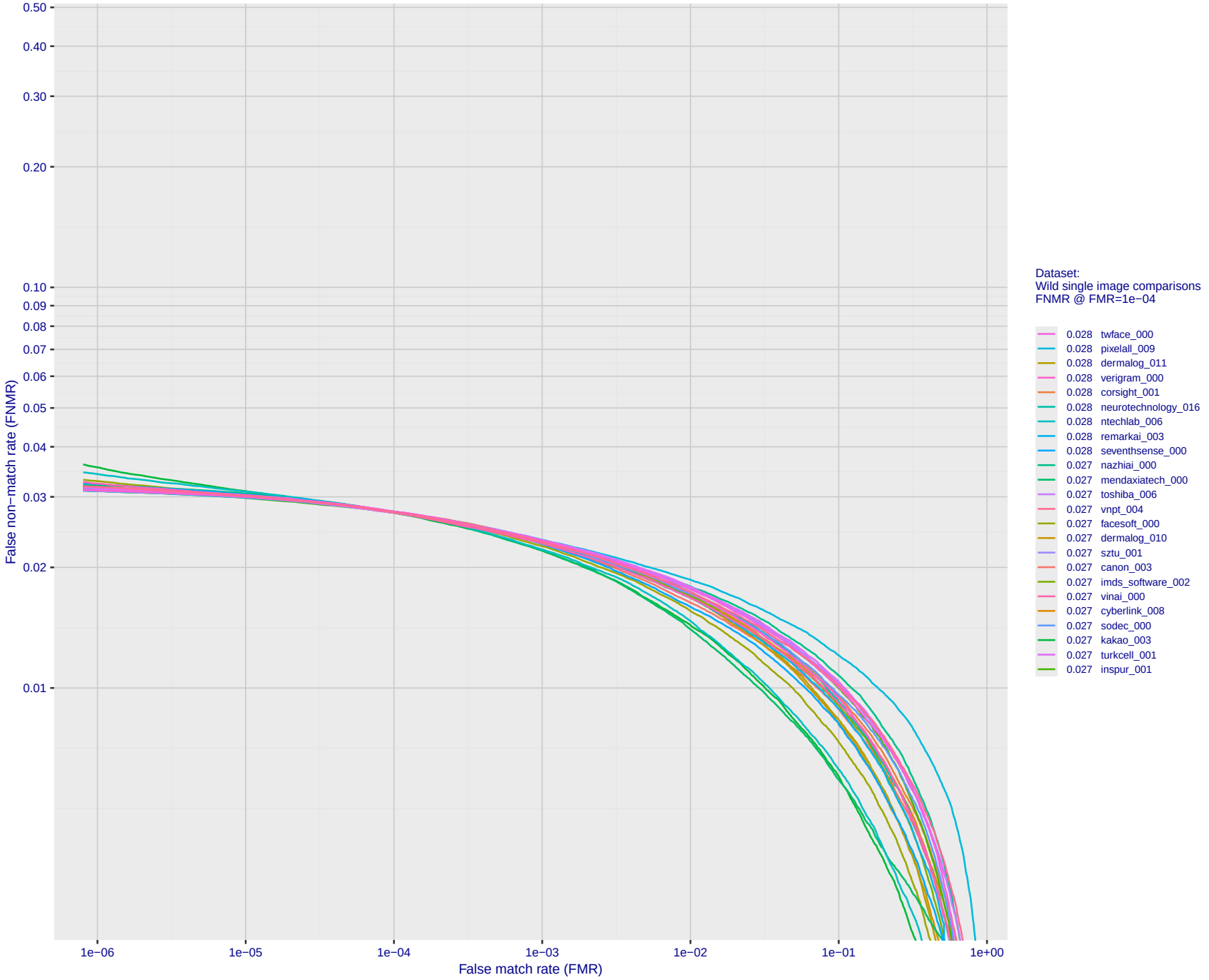

Figure 280: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

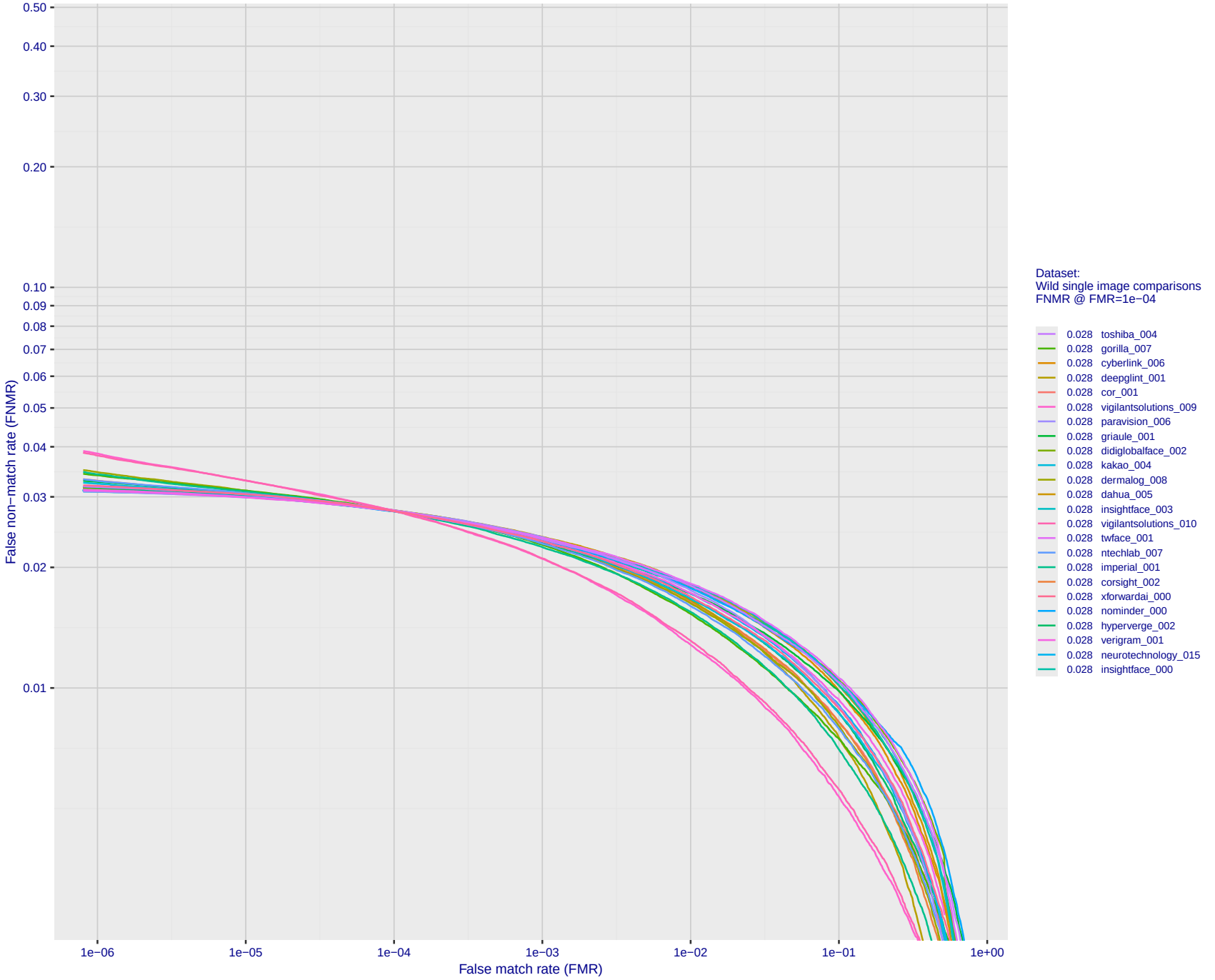

Figure 281: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

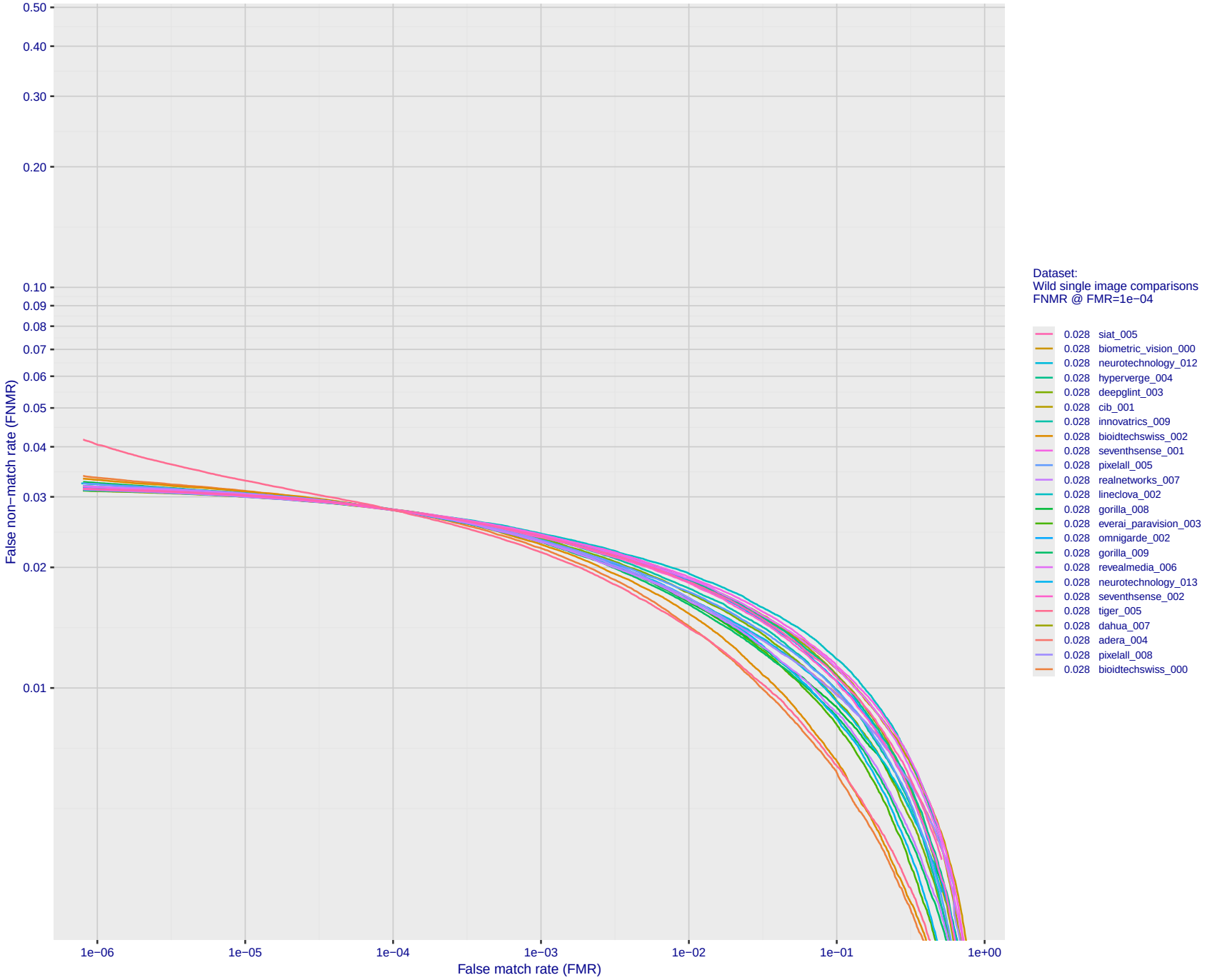

Figure 282: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

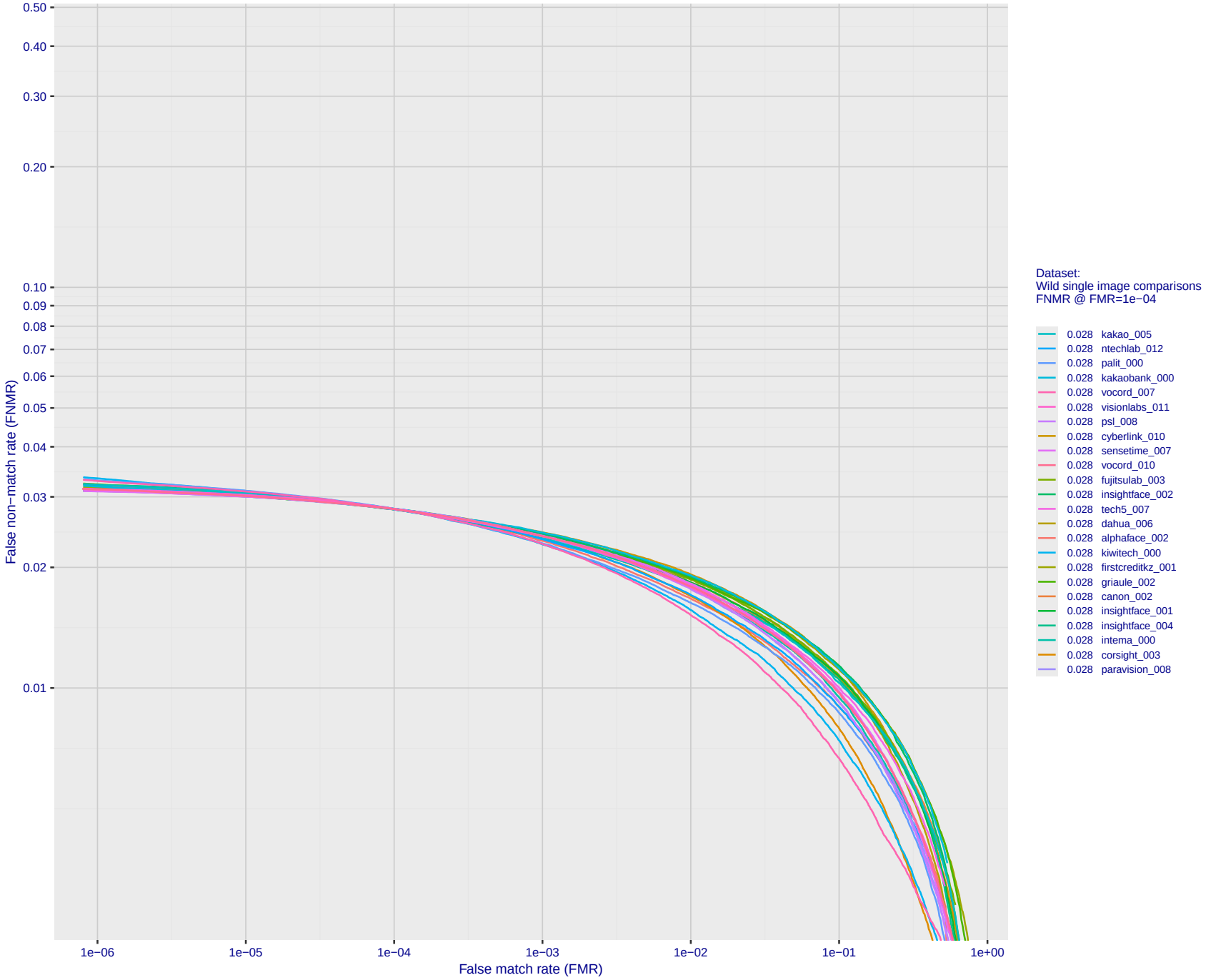

Figure 283: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

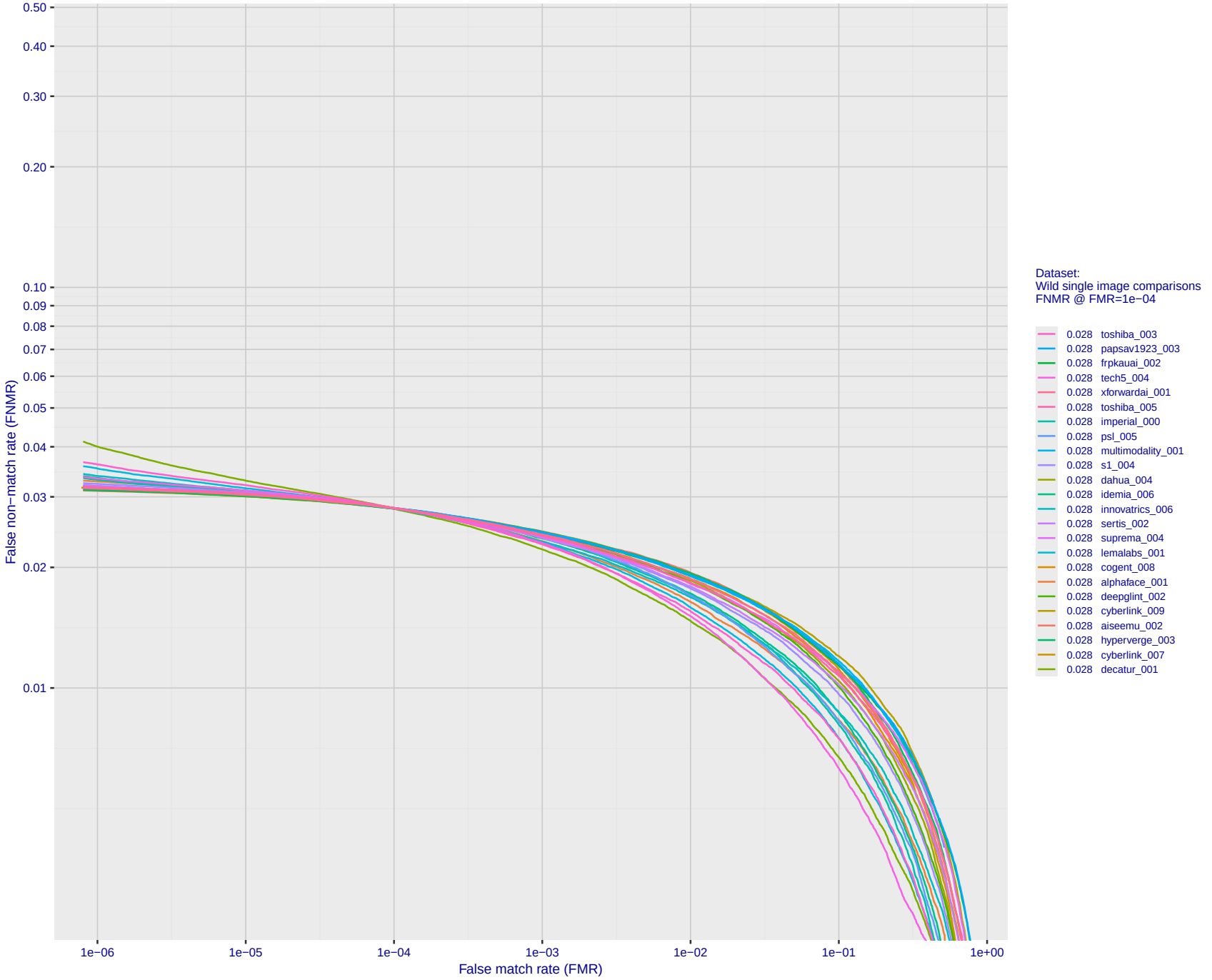

Figure 284: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

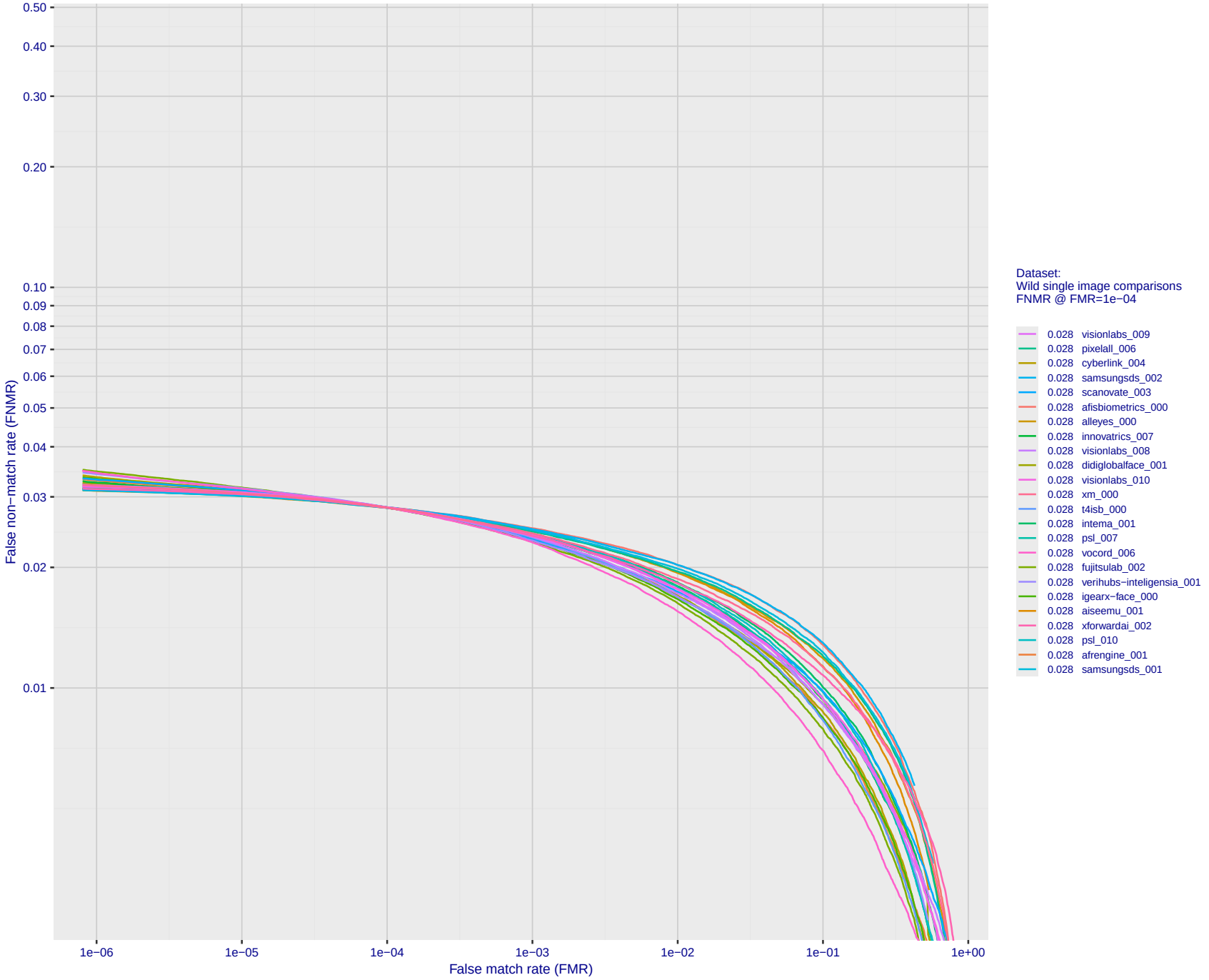

Figure 285: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

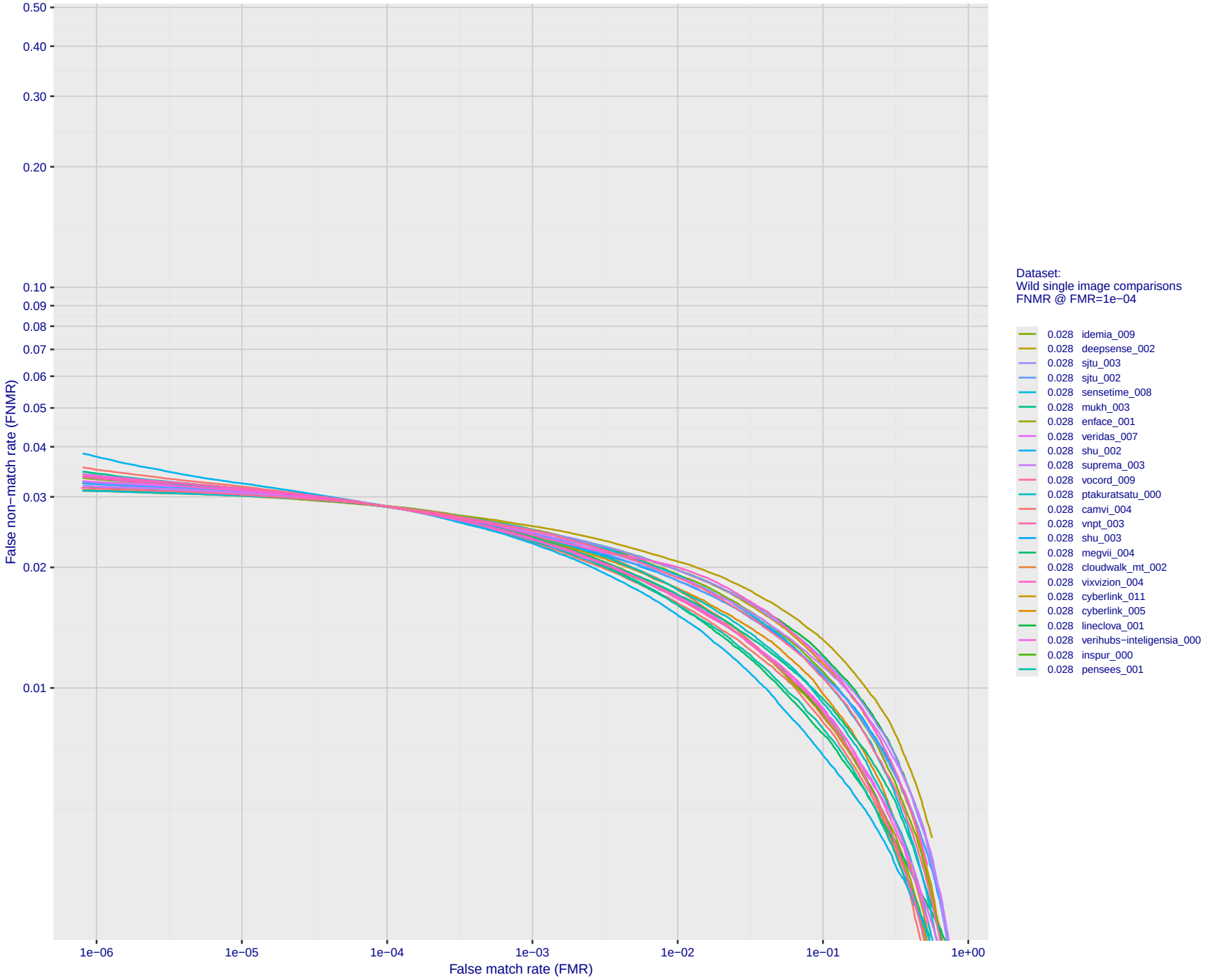

Figure 286: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

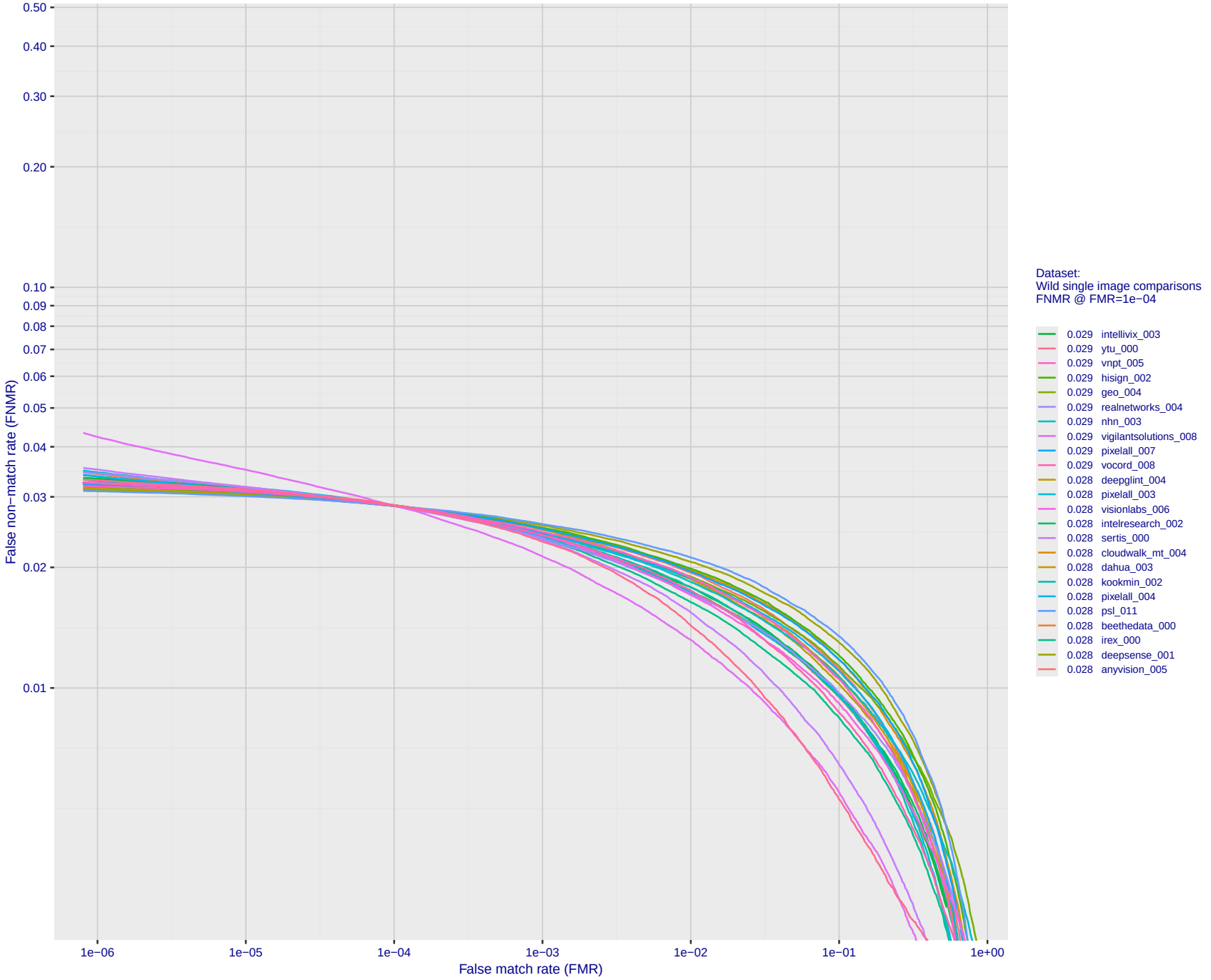

Figure 287: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

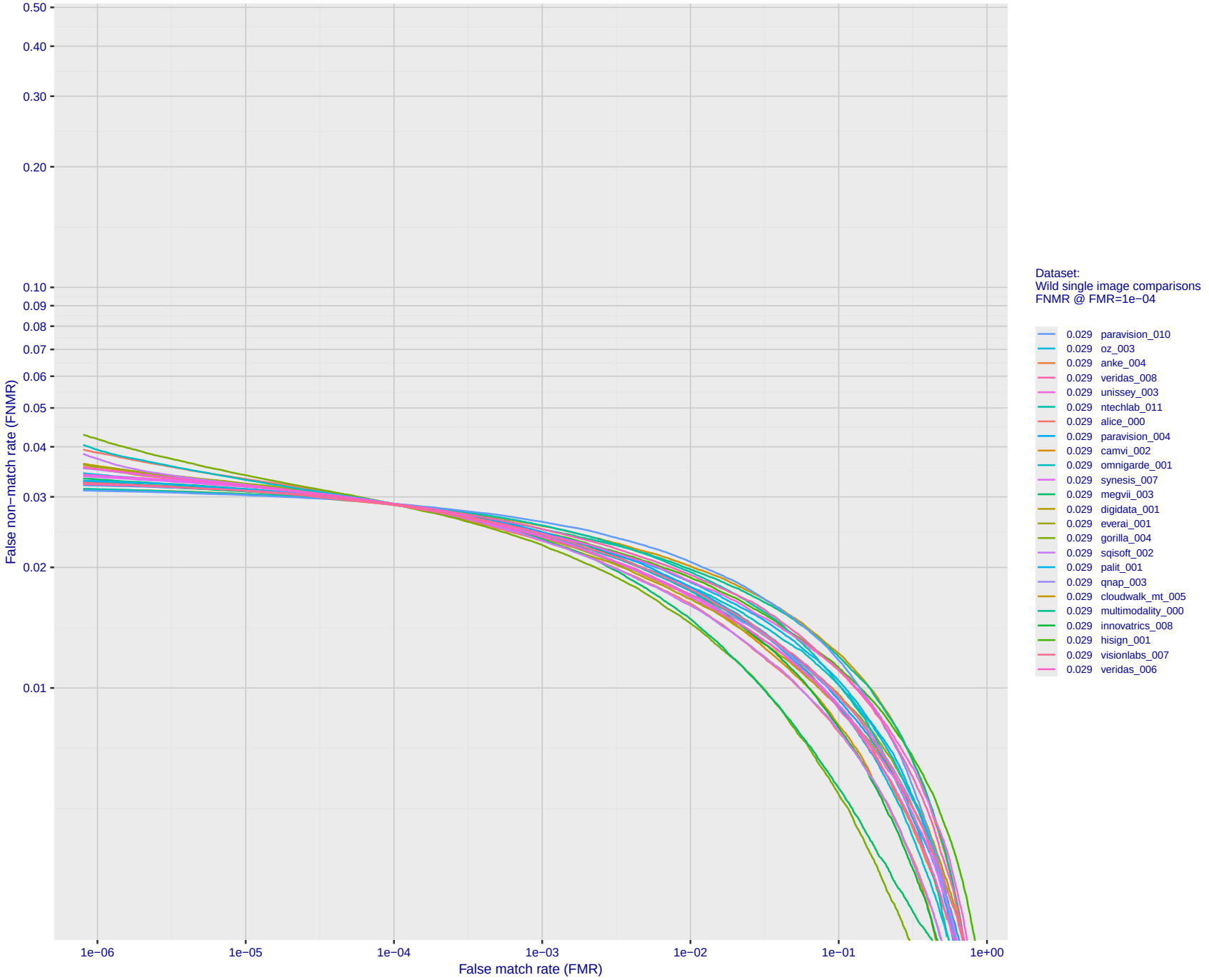

Figure 288: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

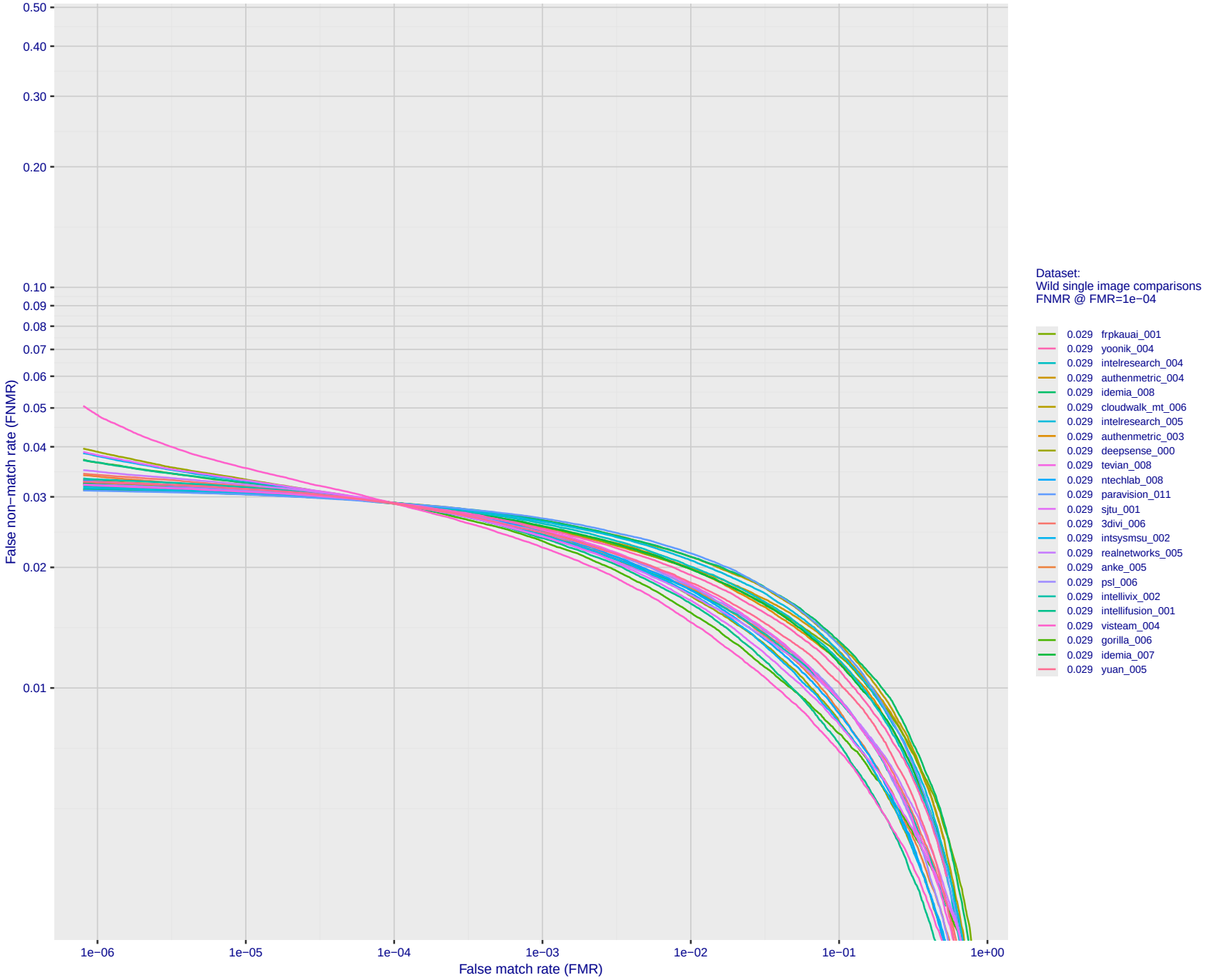

Figure 289: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

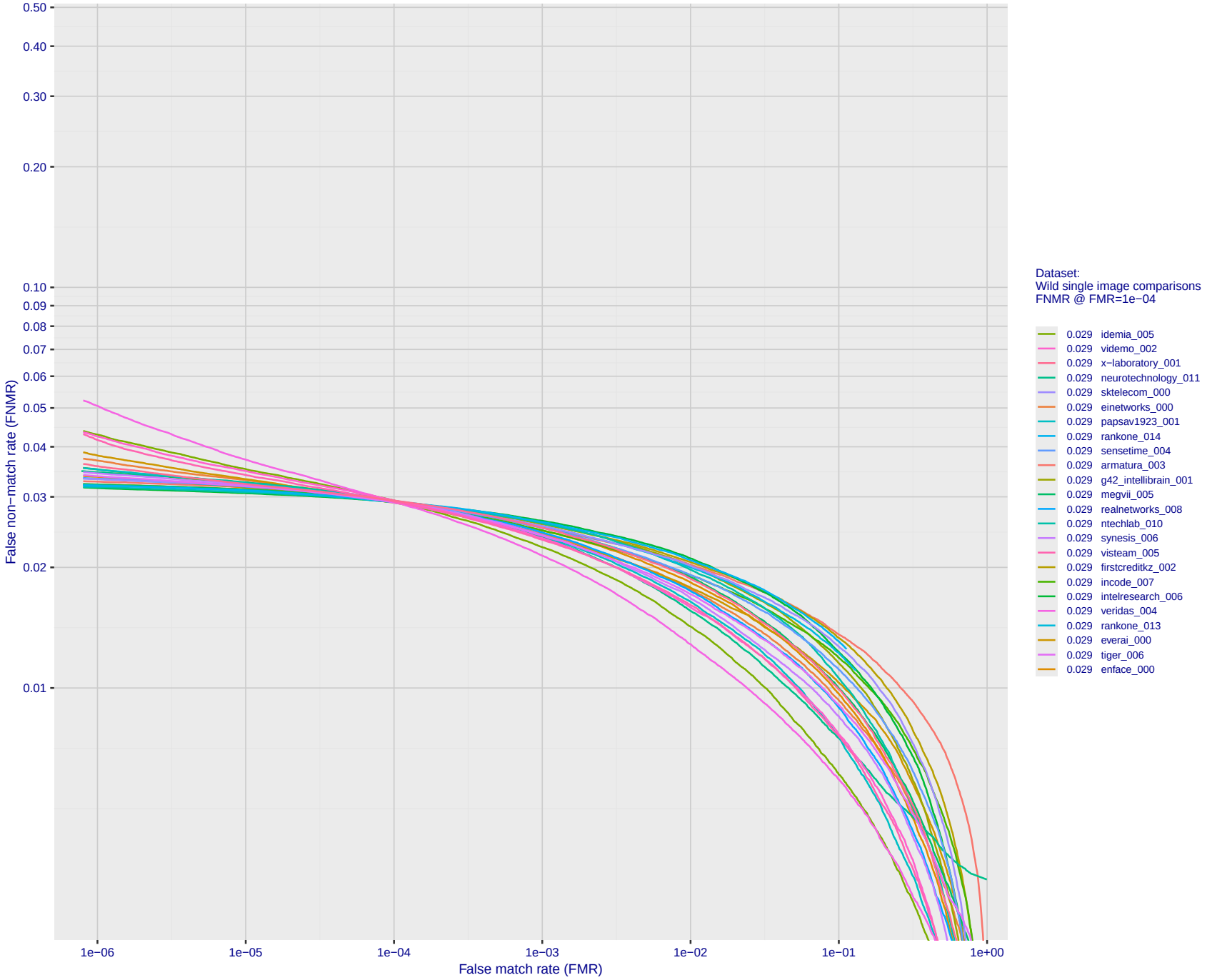

Figure 290: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

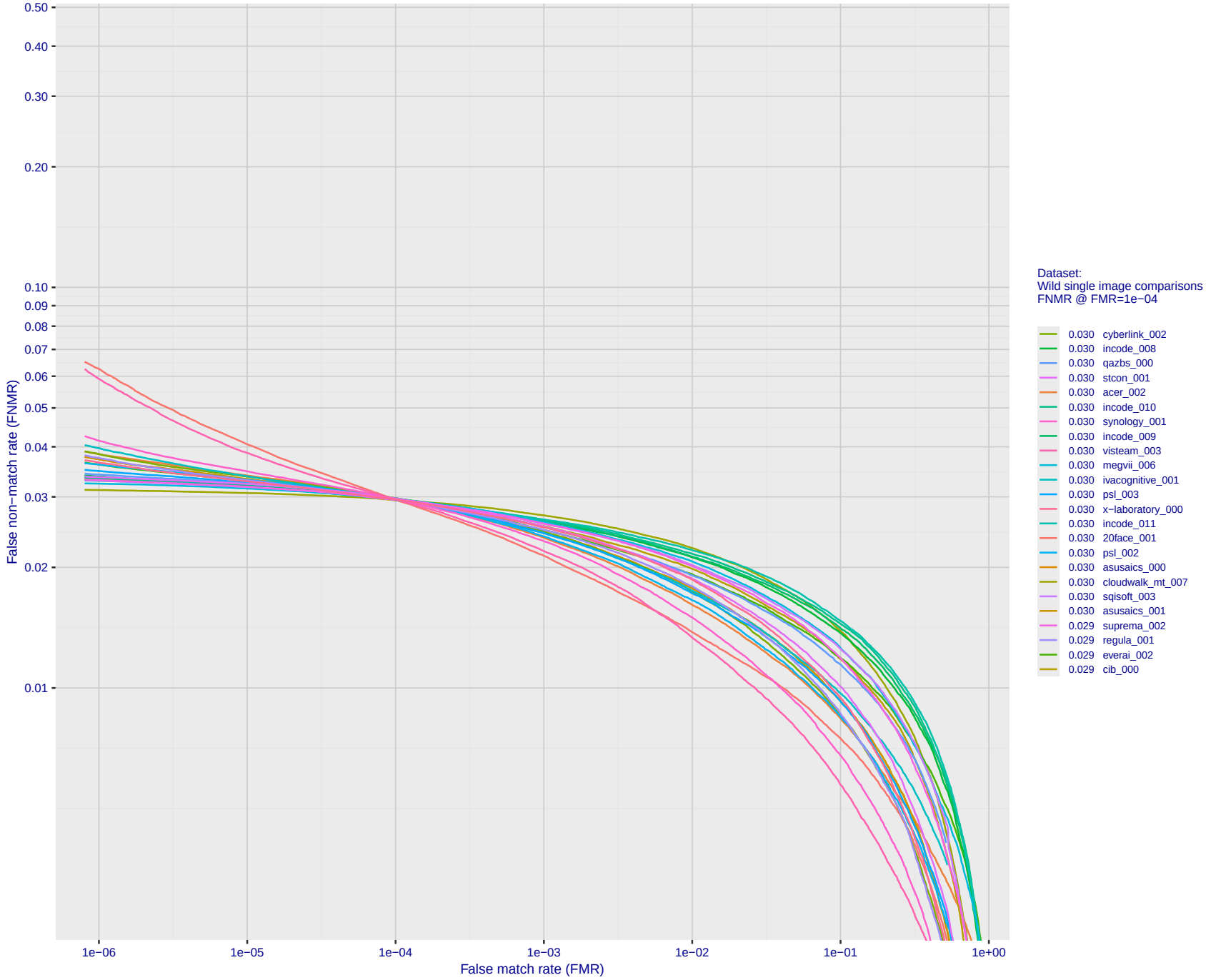

Figure 291: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

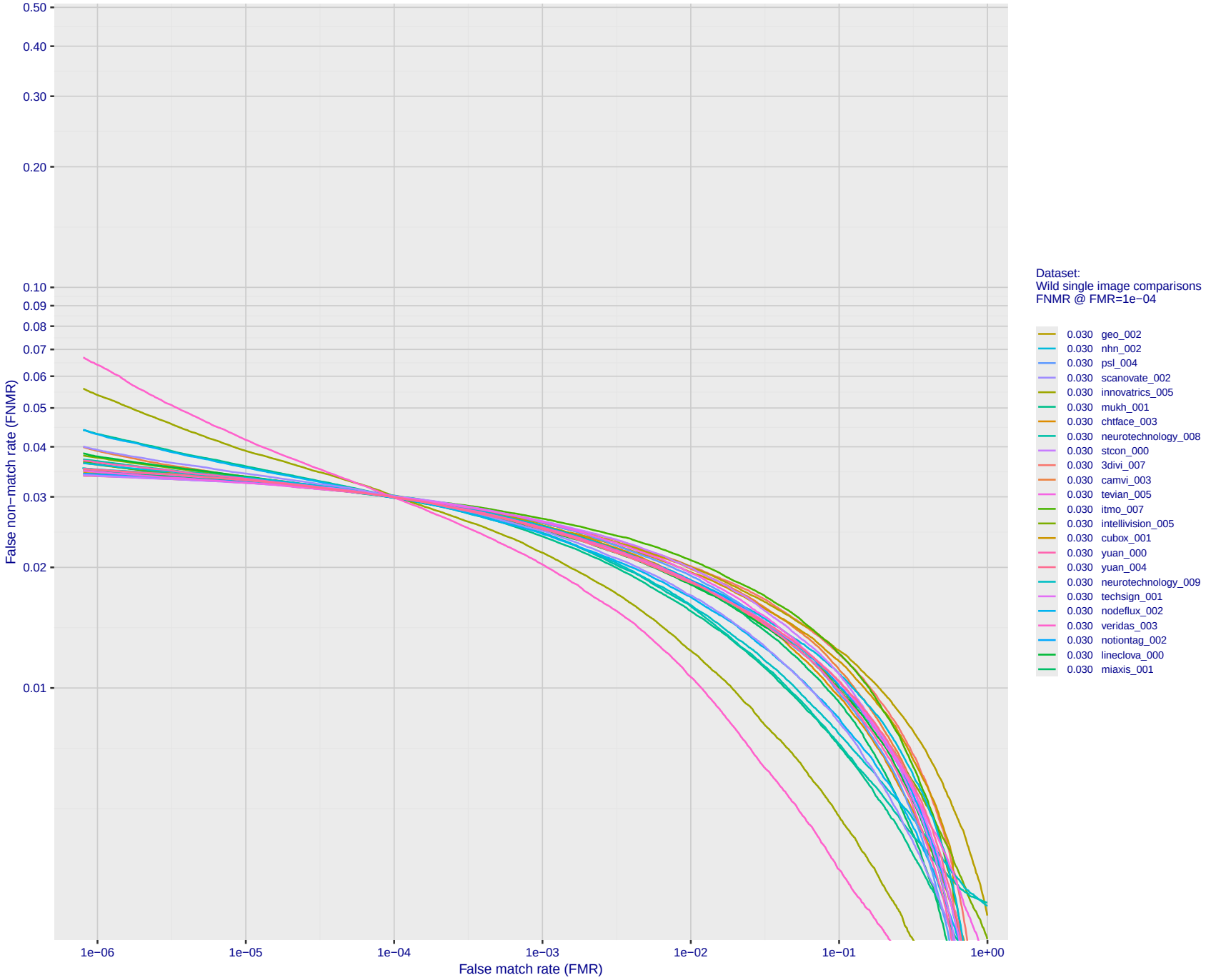

Figure 292: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

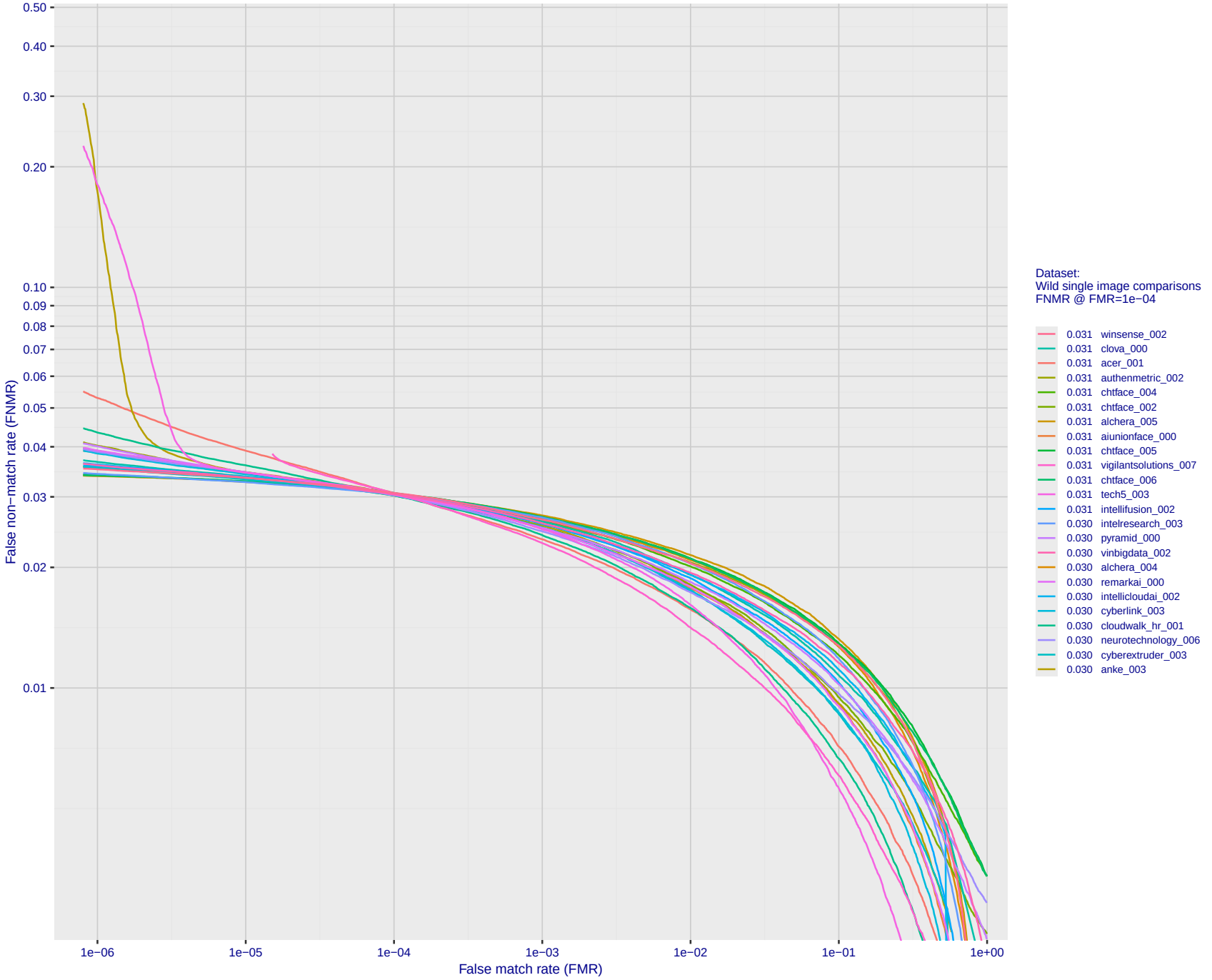

Figure 293: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

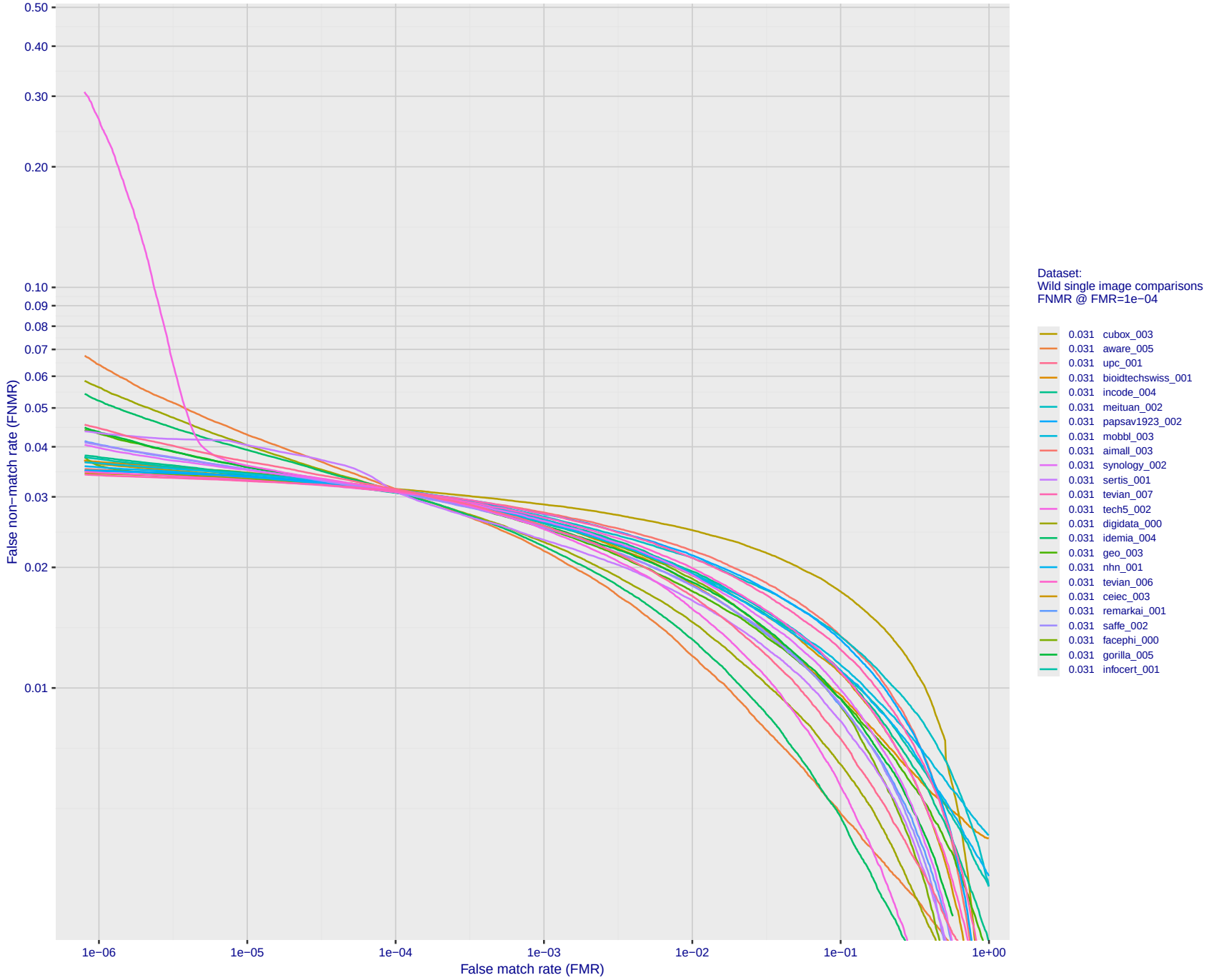

Figure 294: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

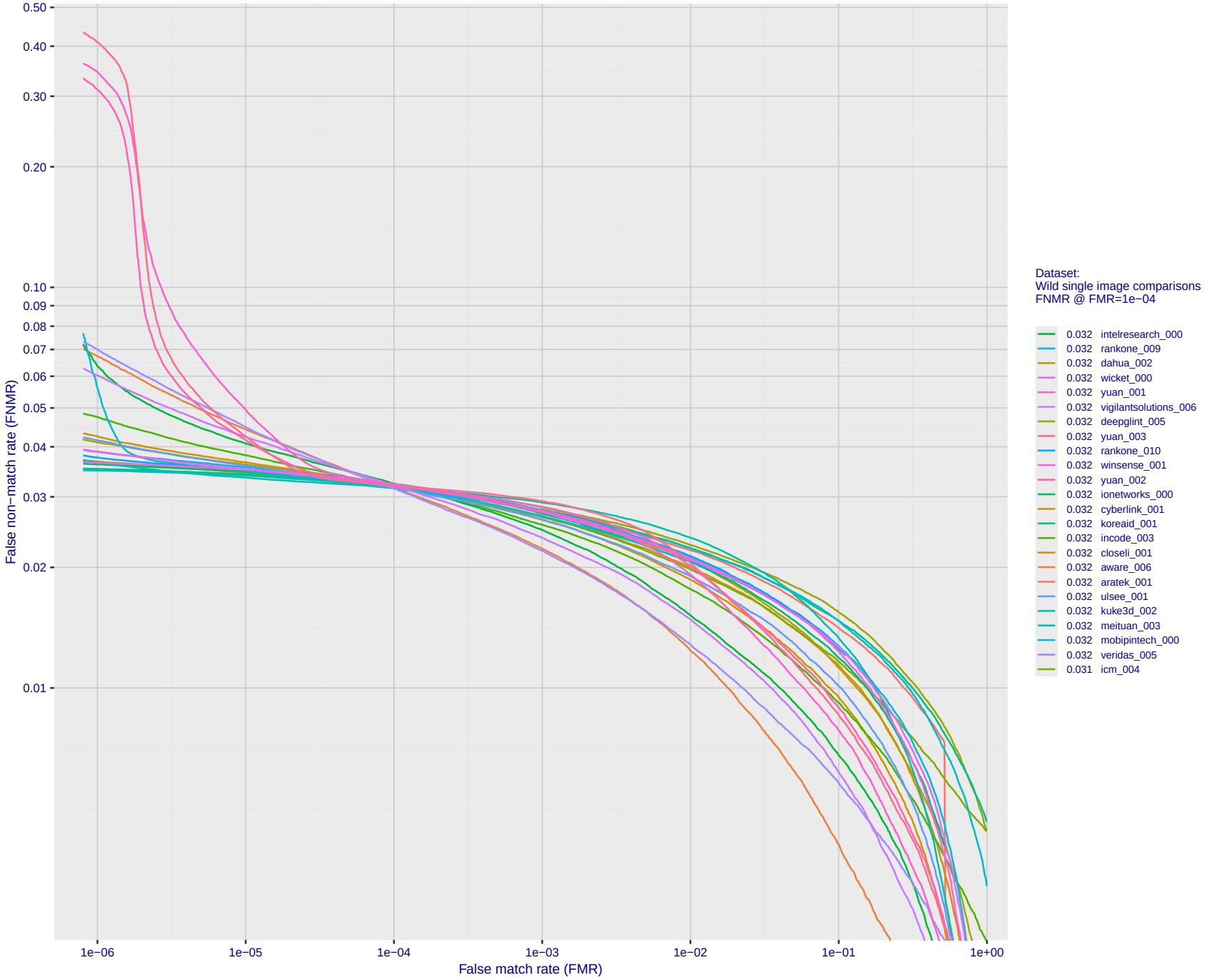

Figure 295: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

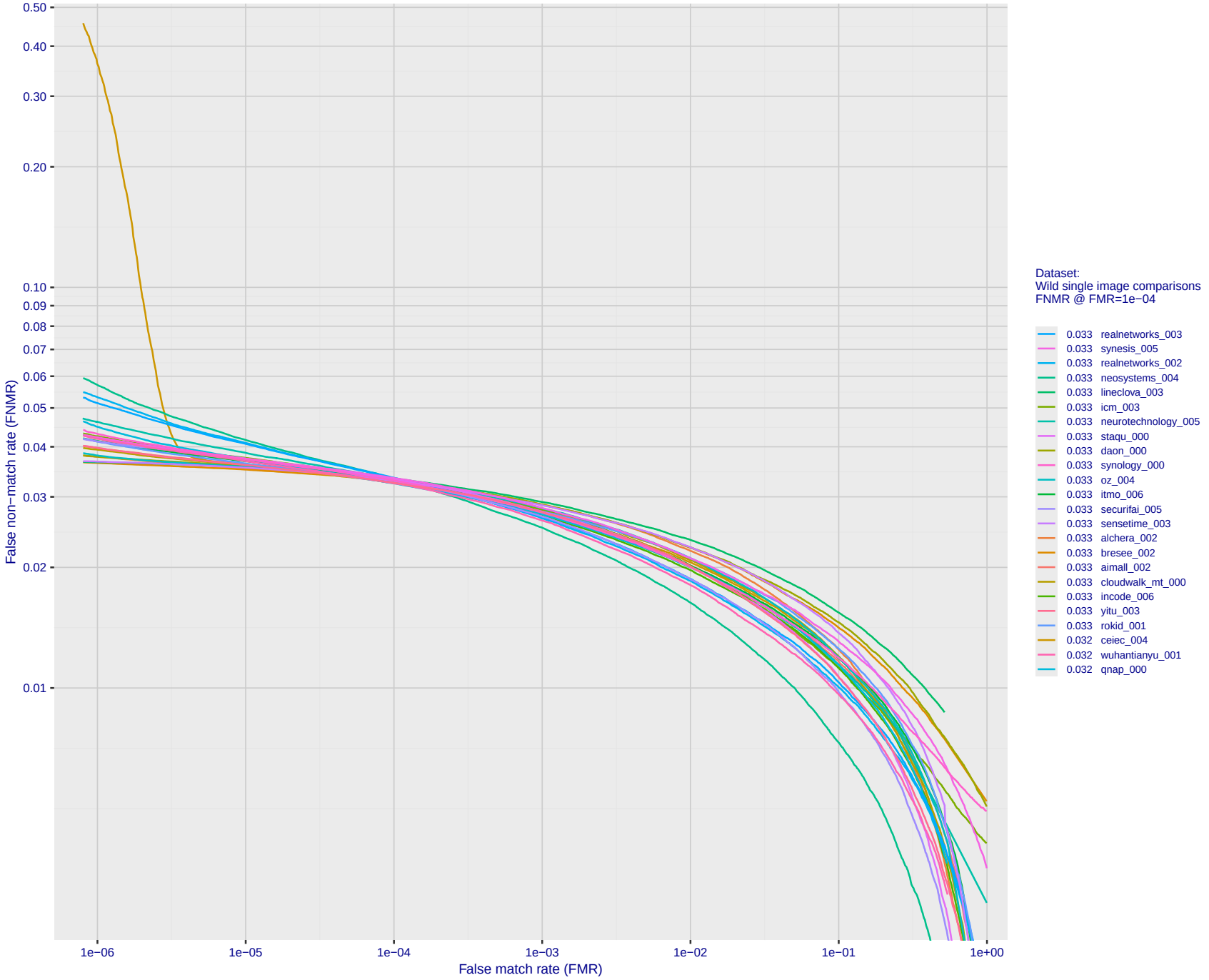

Figure 296: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

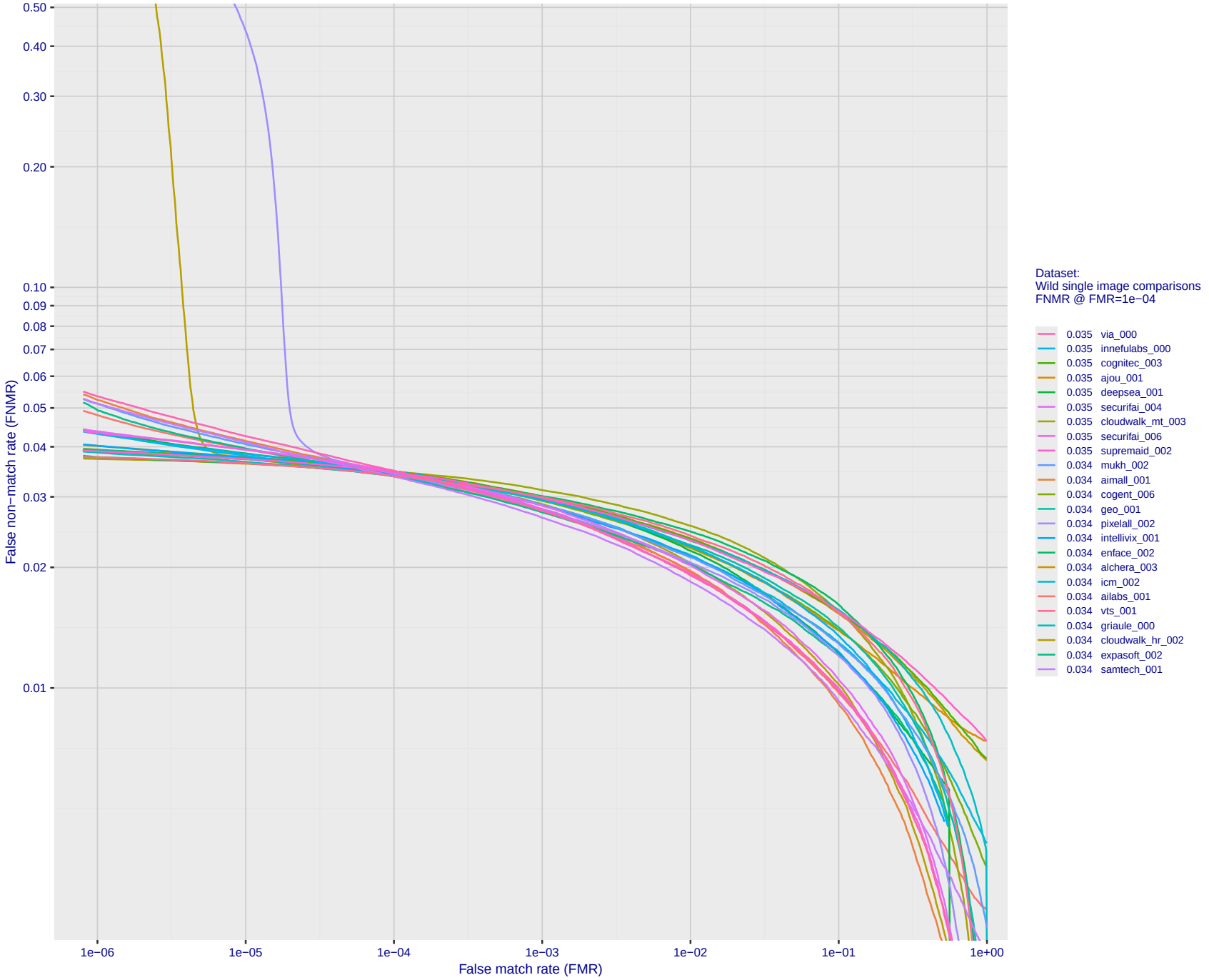

Figure 297: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

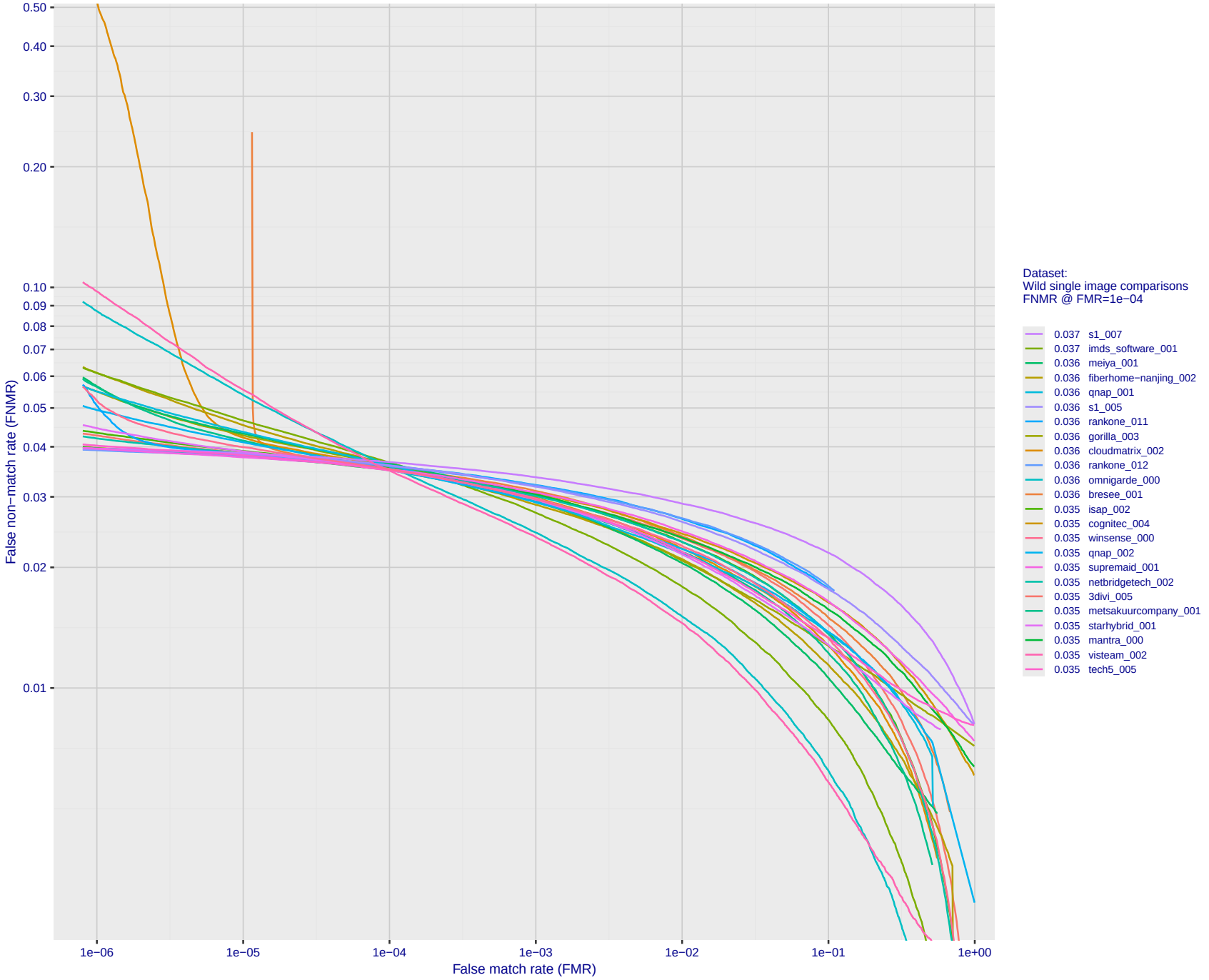

Figure 298: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate"
FMR(T) "False match rate"

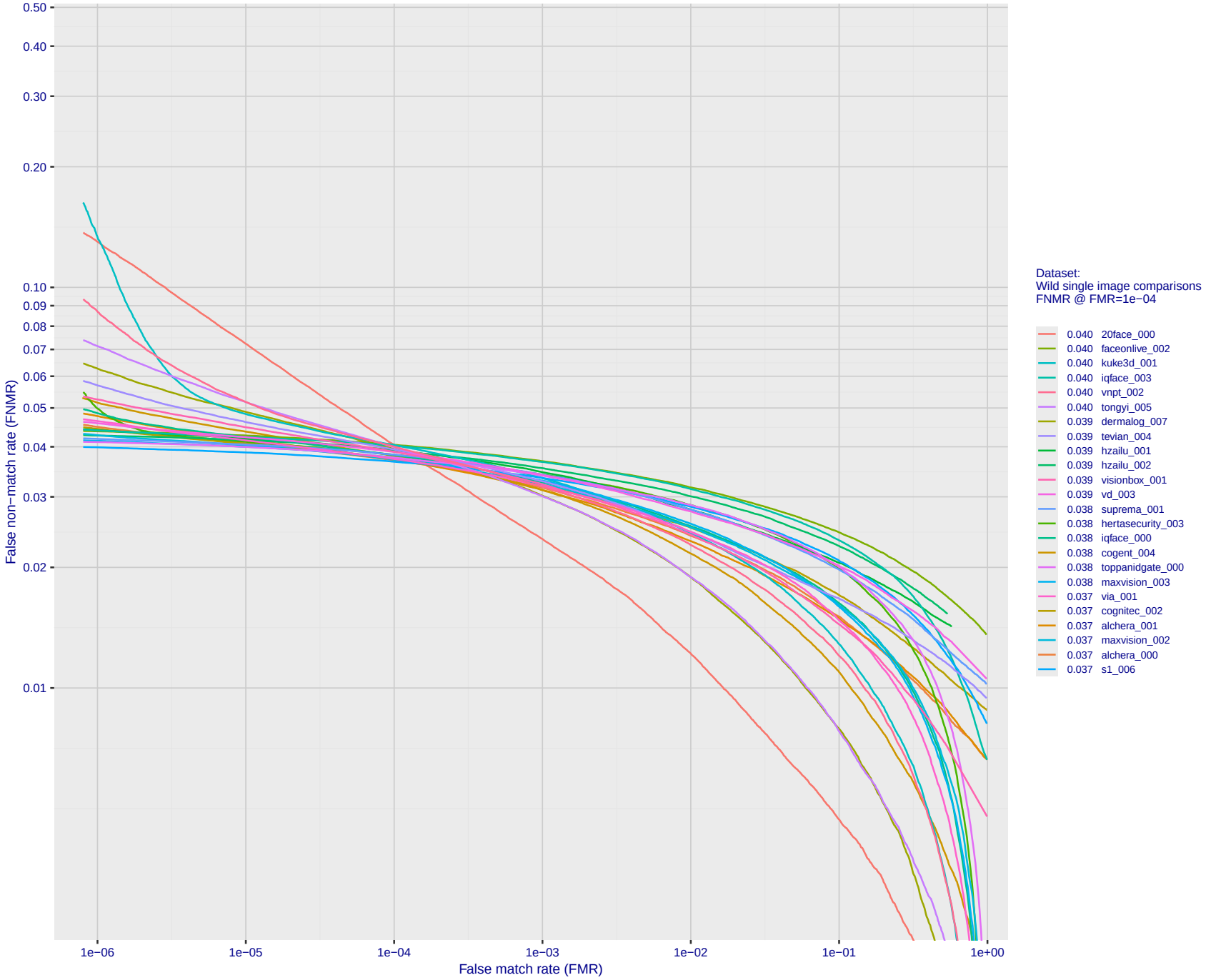

Figure 299: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

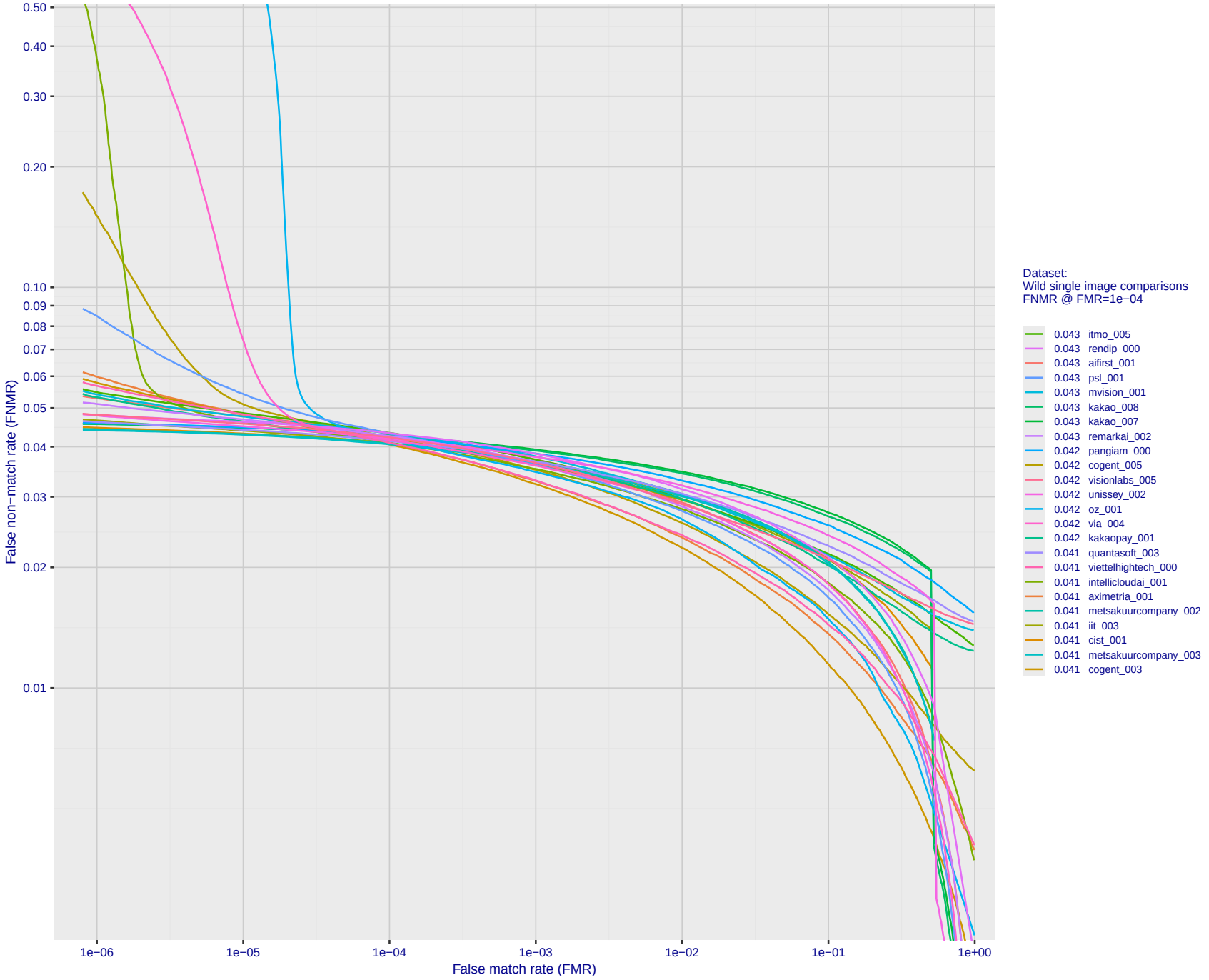

Figure 300: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 "False non-match rate" FNMR(T) "False match rate" FMR(T)

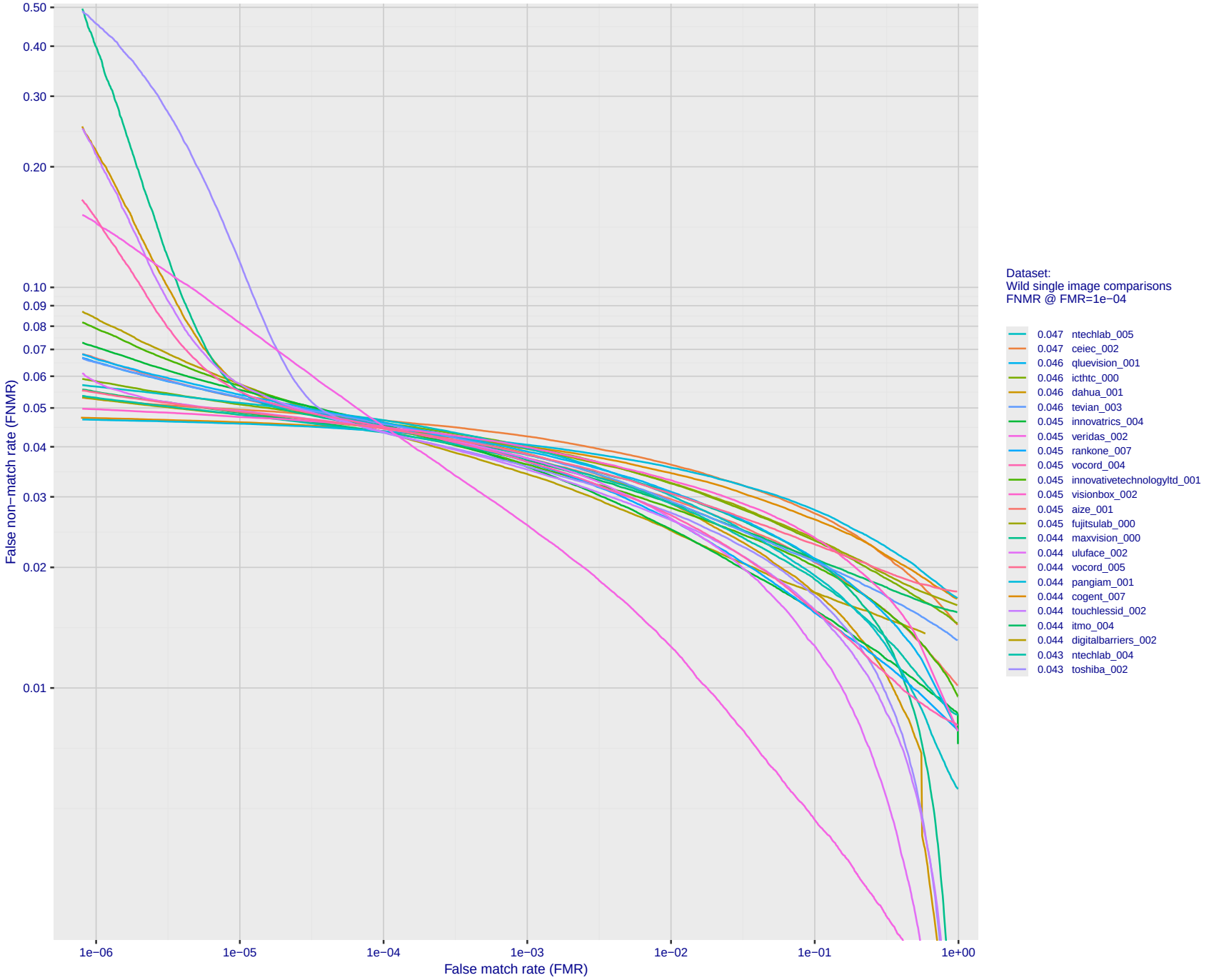

Figure 301: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

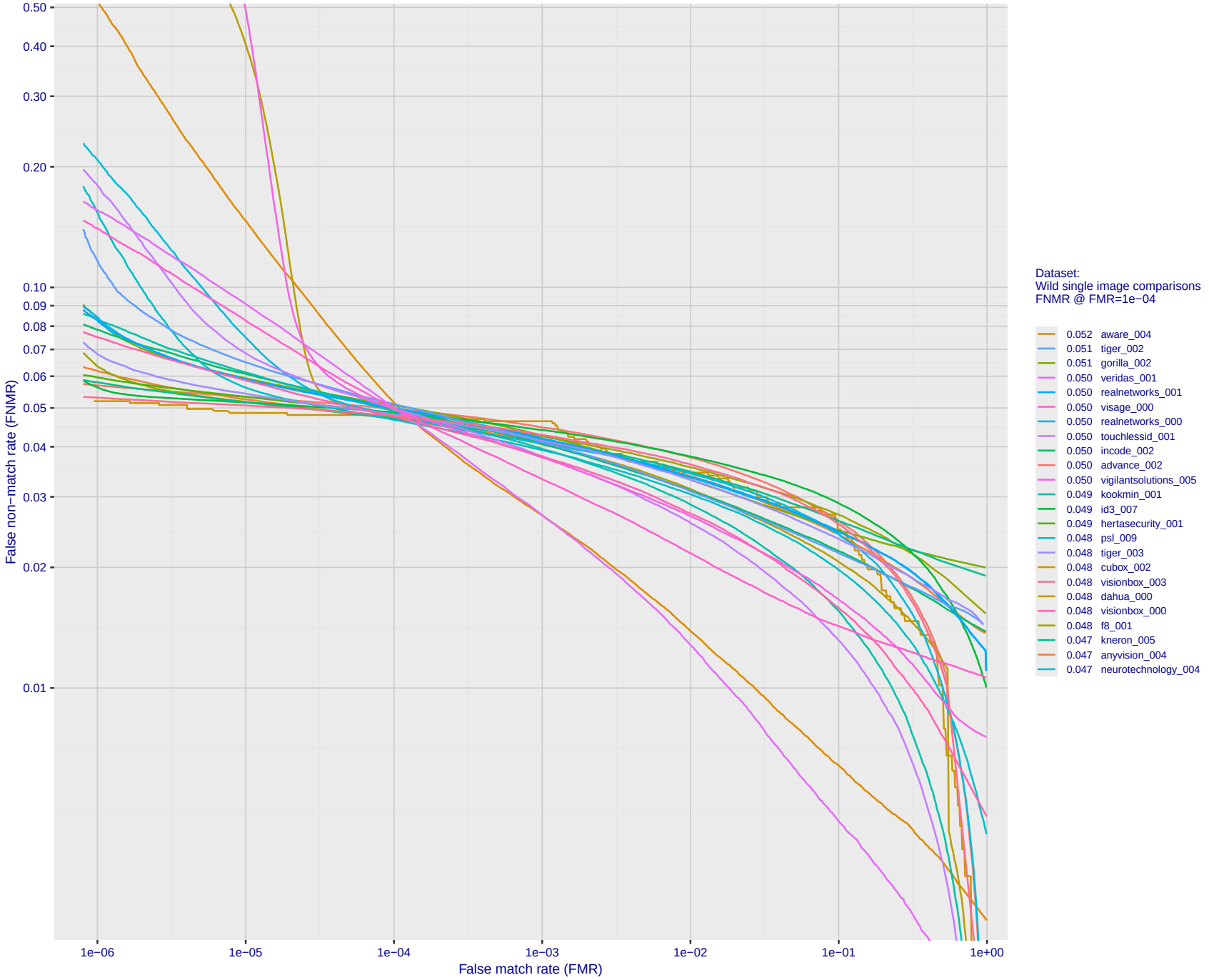

Figure 302: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

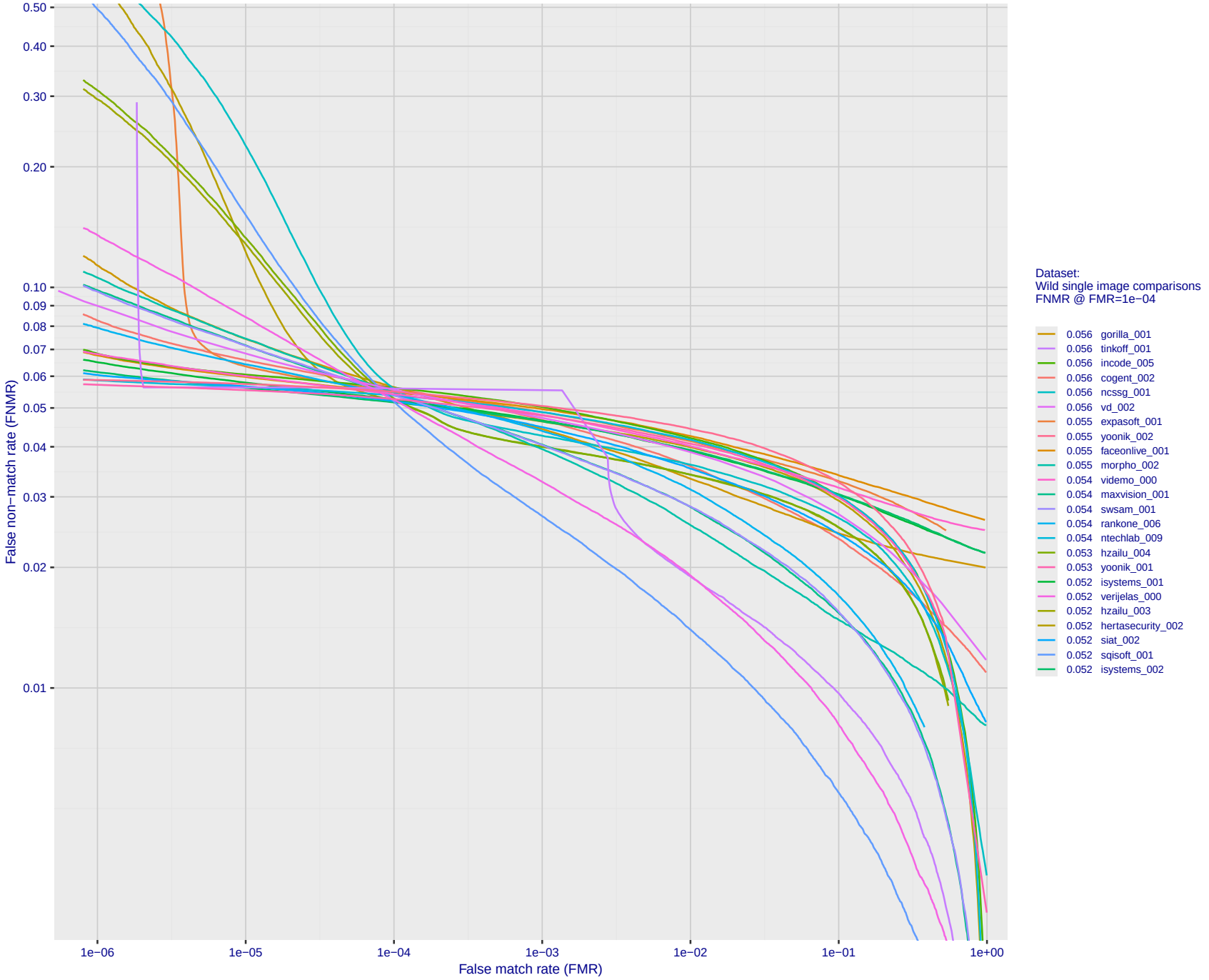

Figure 303: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

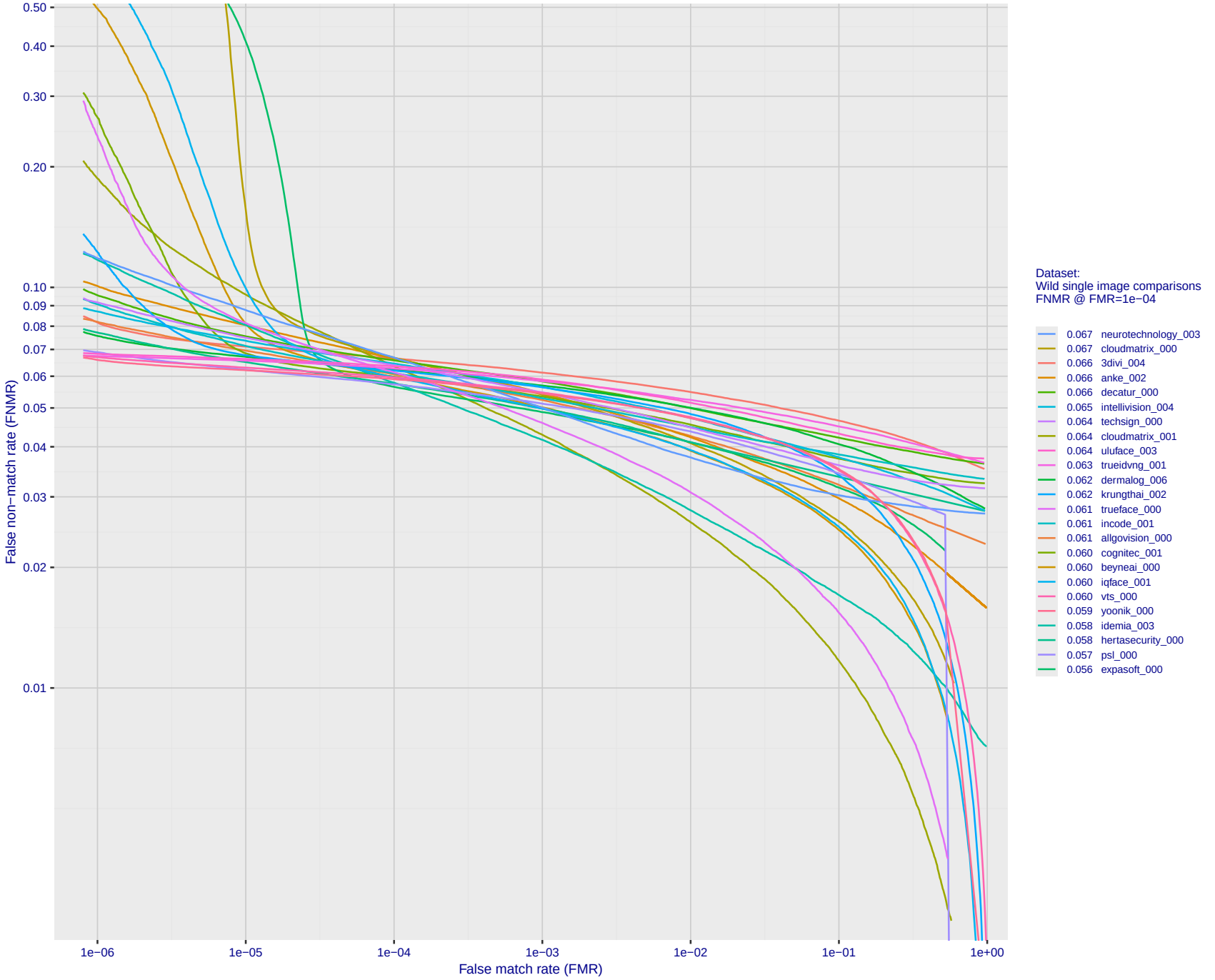

Figure 304: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

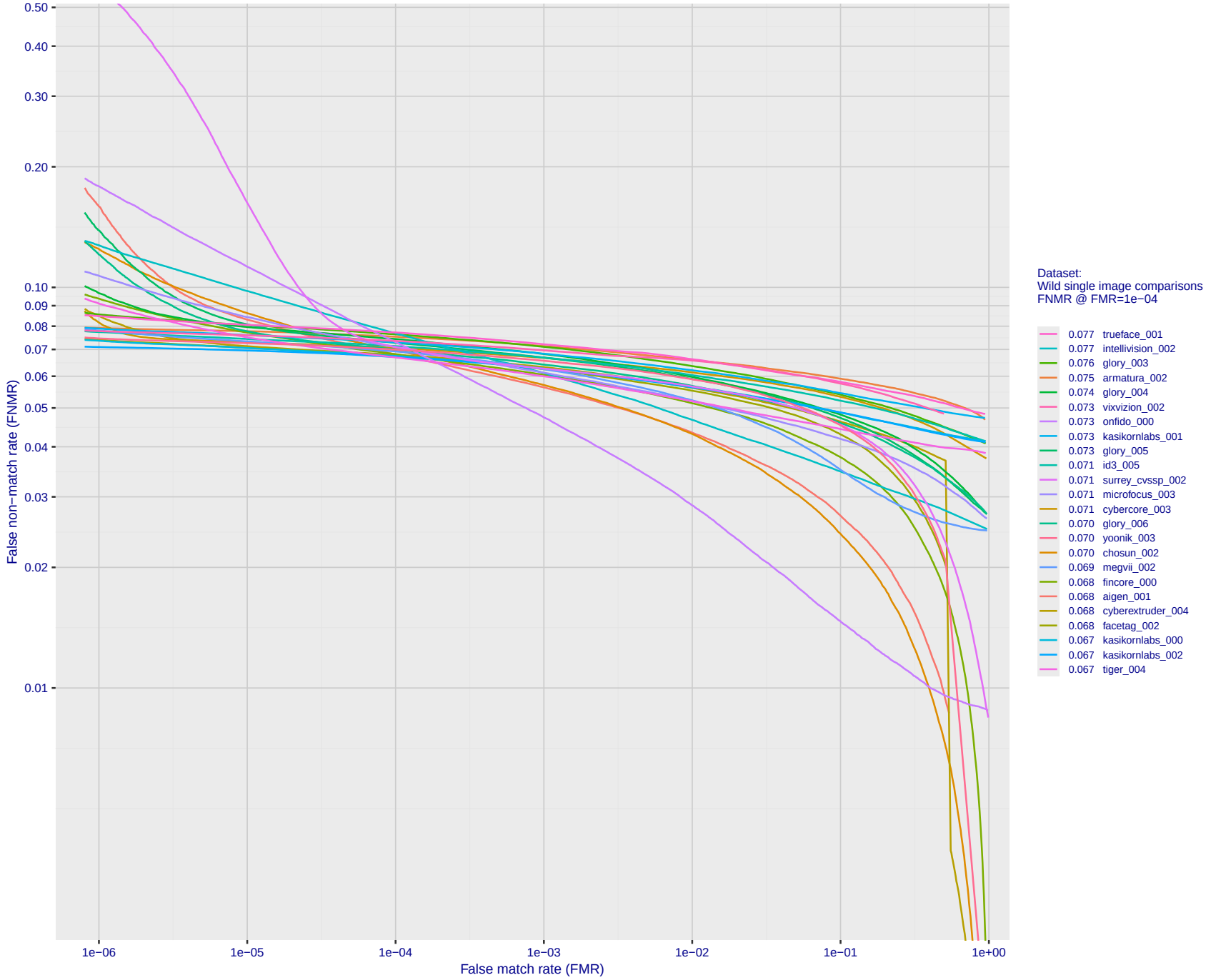

Figure 305: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

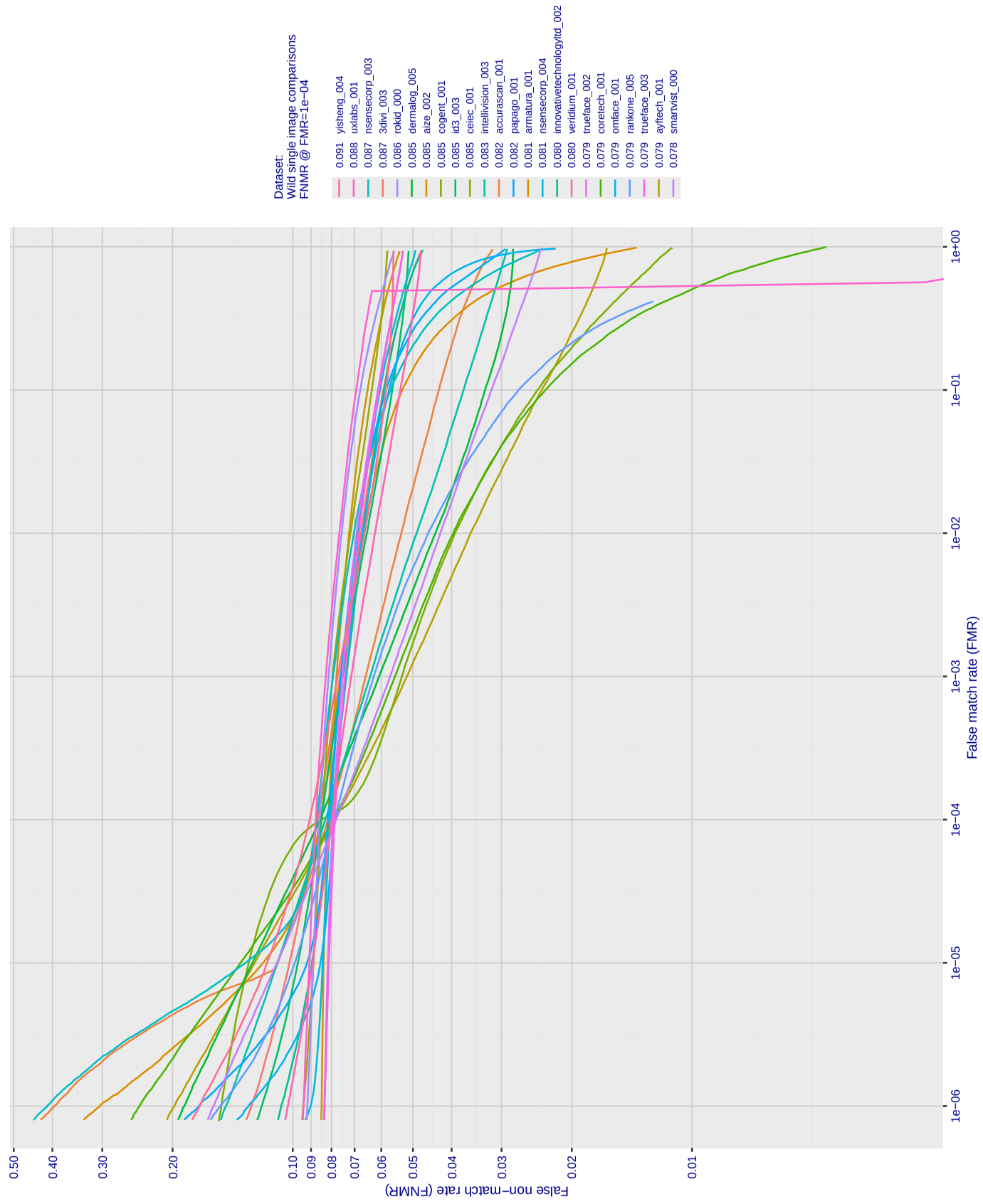

Figure 306: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

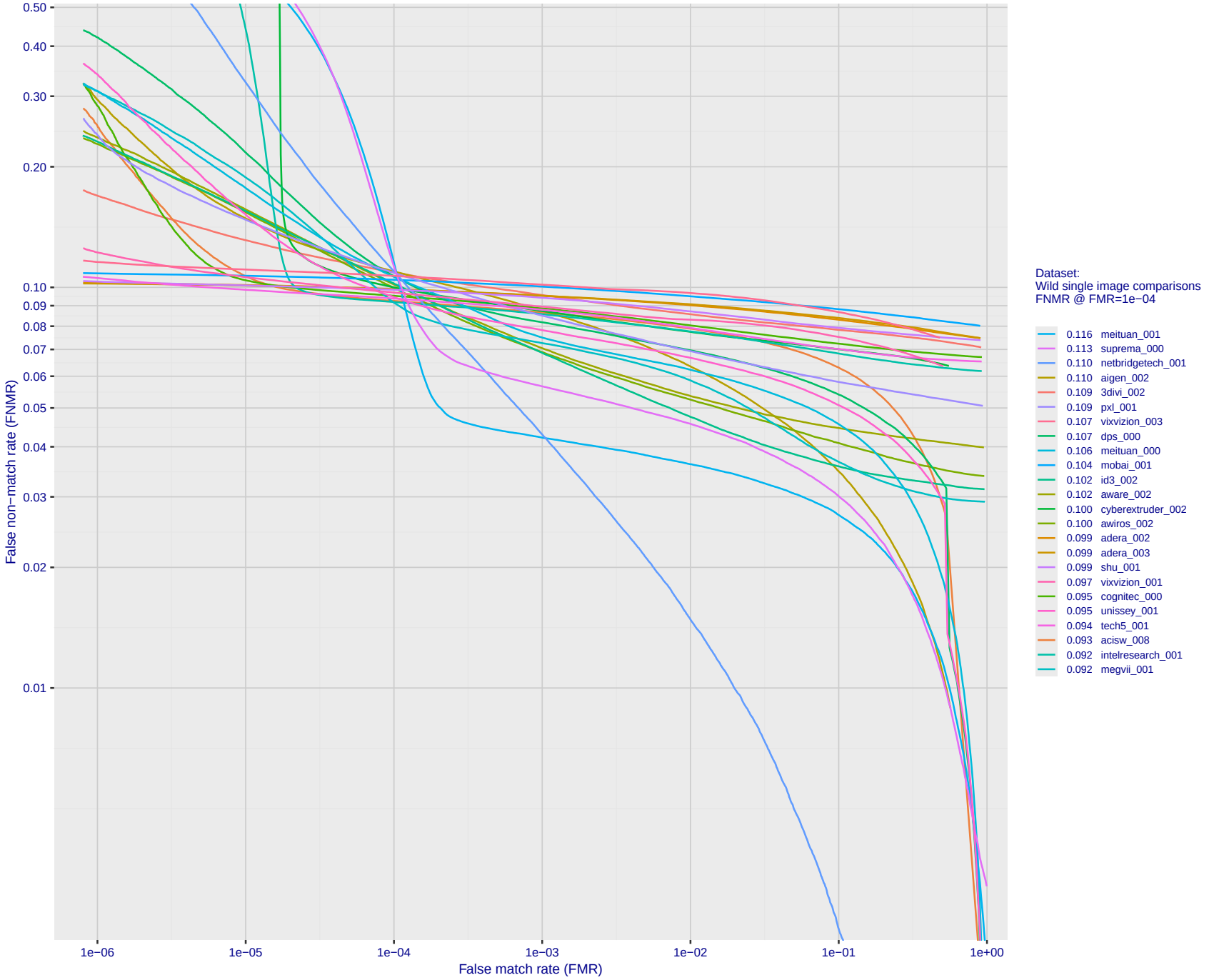

Figure 307: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

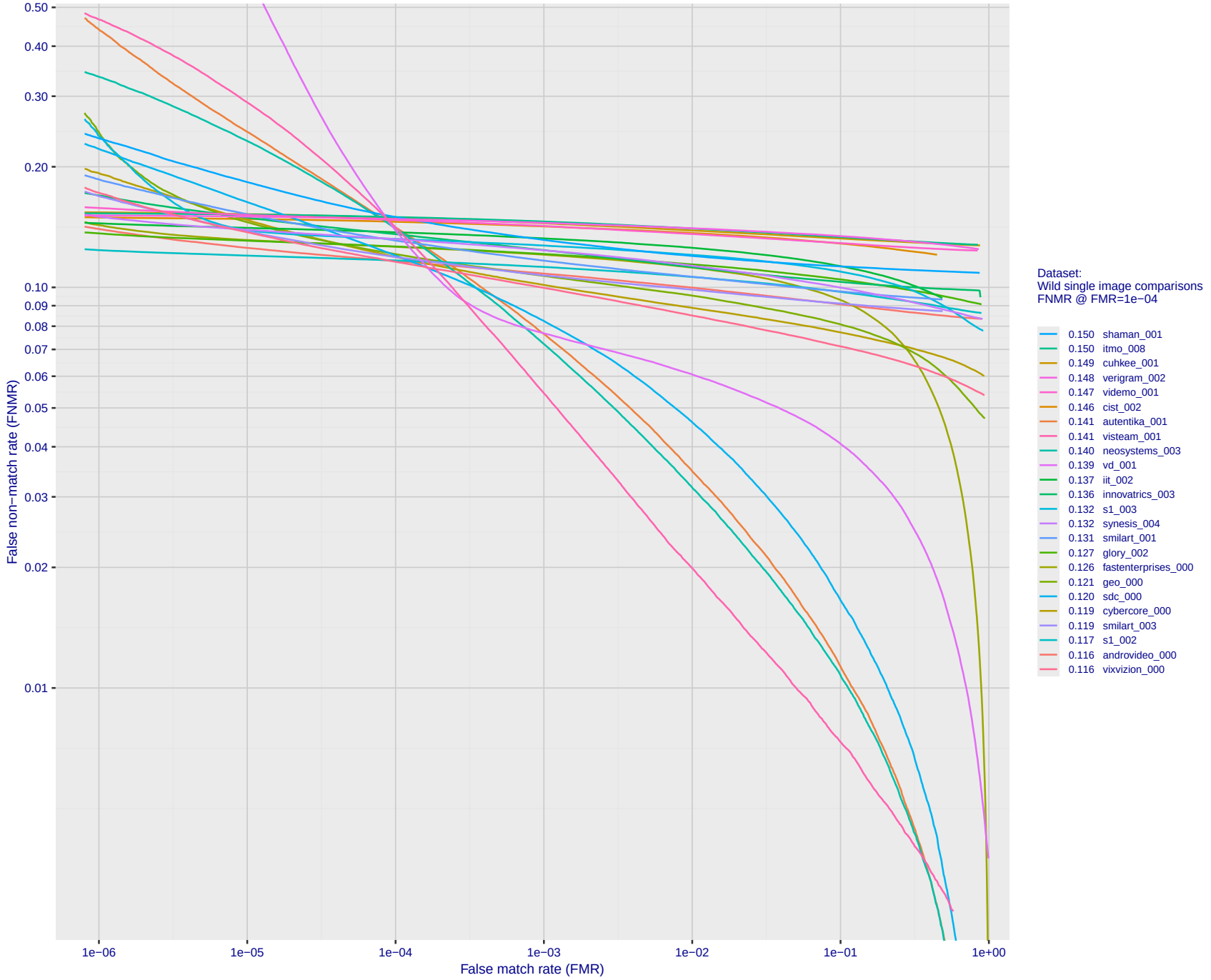

Figure 308: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

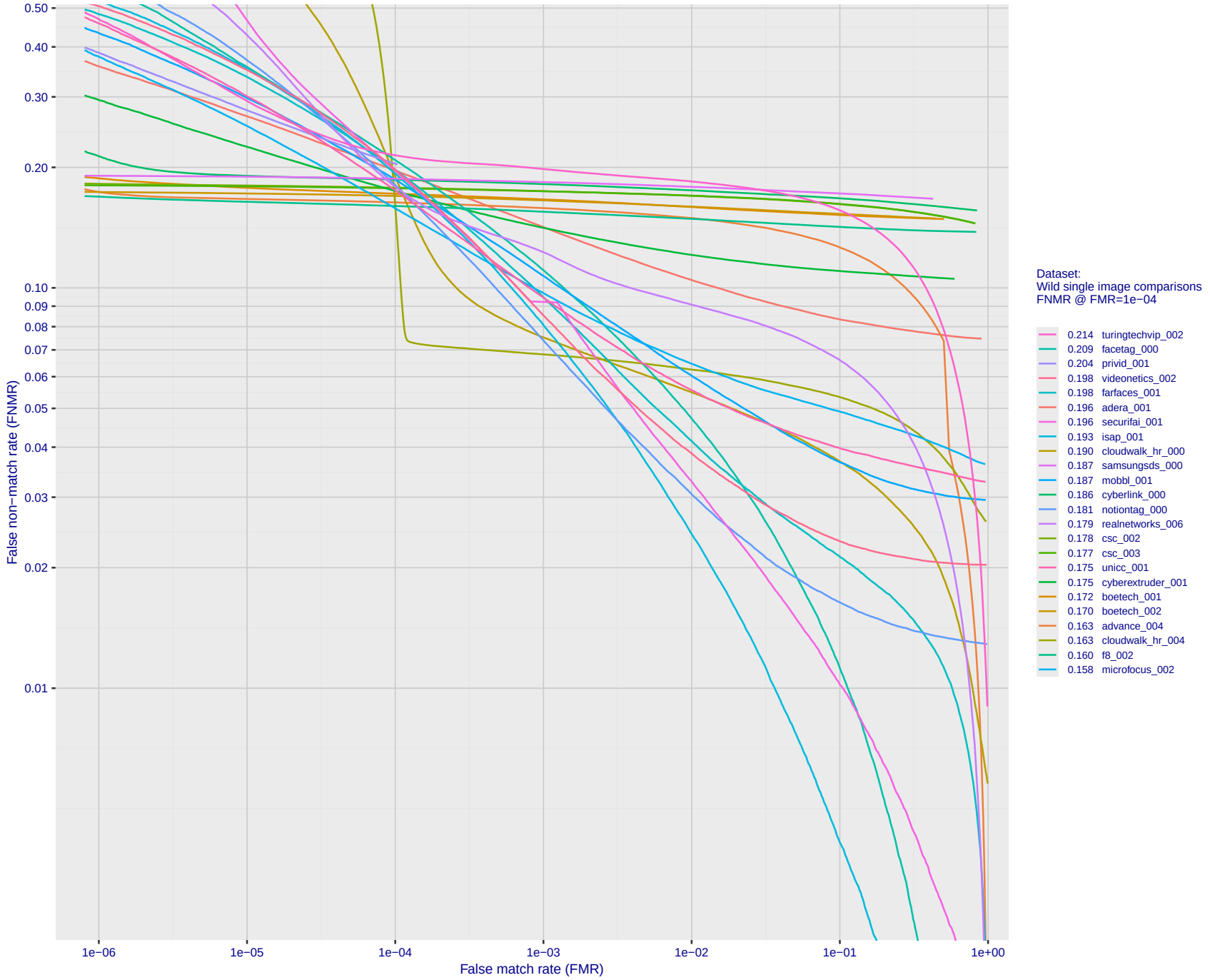

Figure 309: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 "False non-match rate" FNMR(T)
"False match rate" FMR(T)

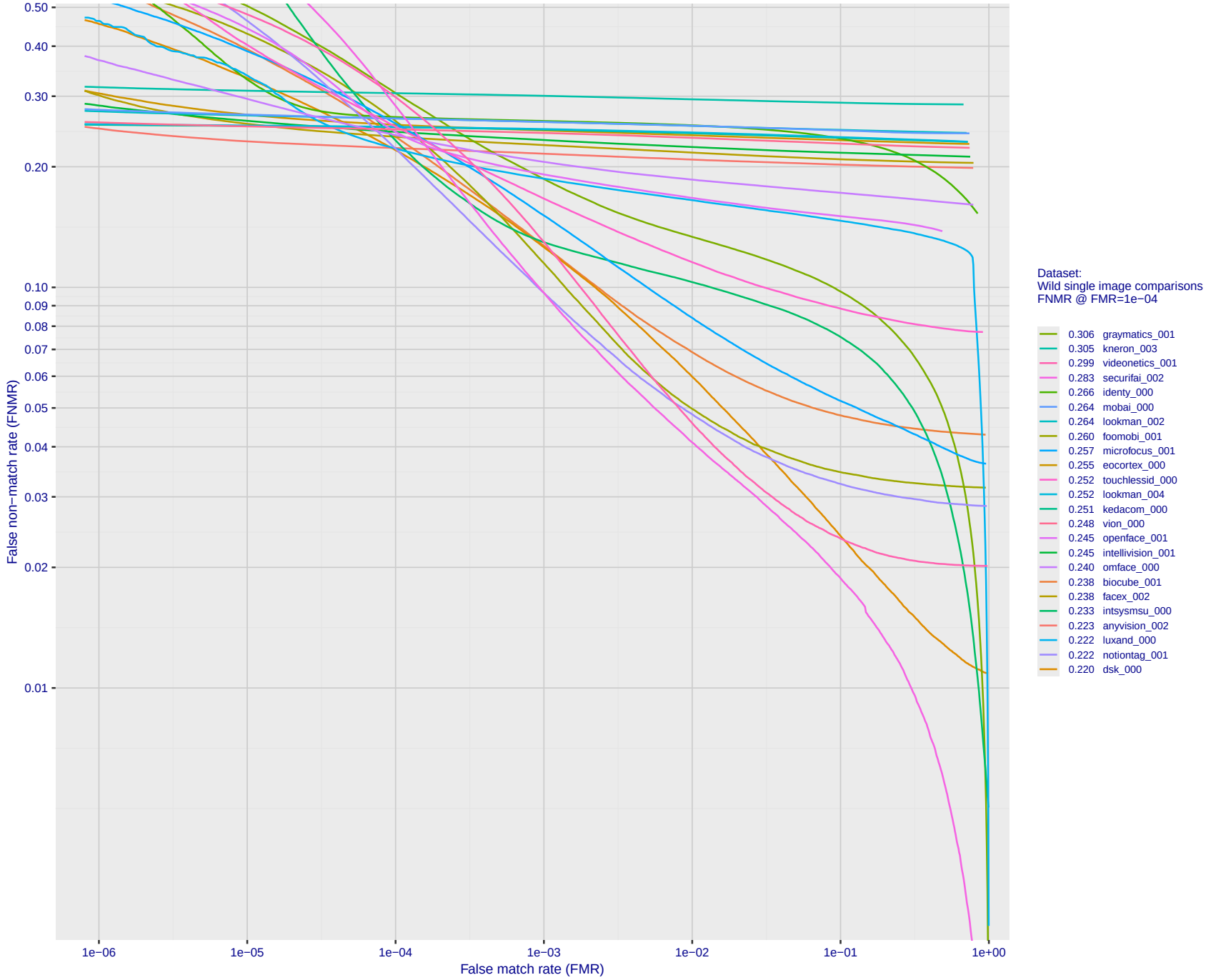

Figure 310: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

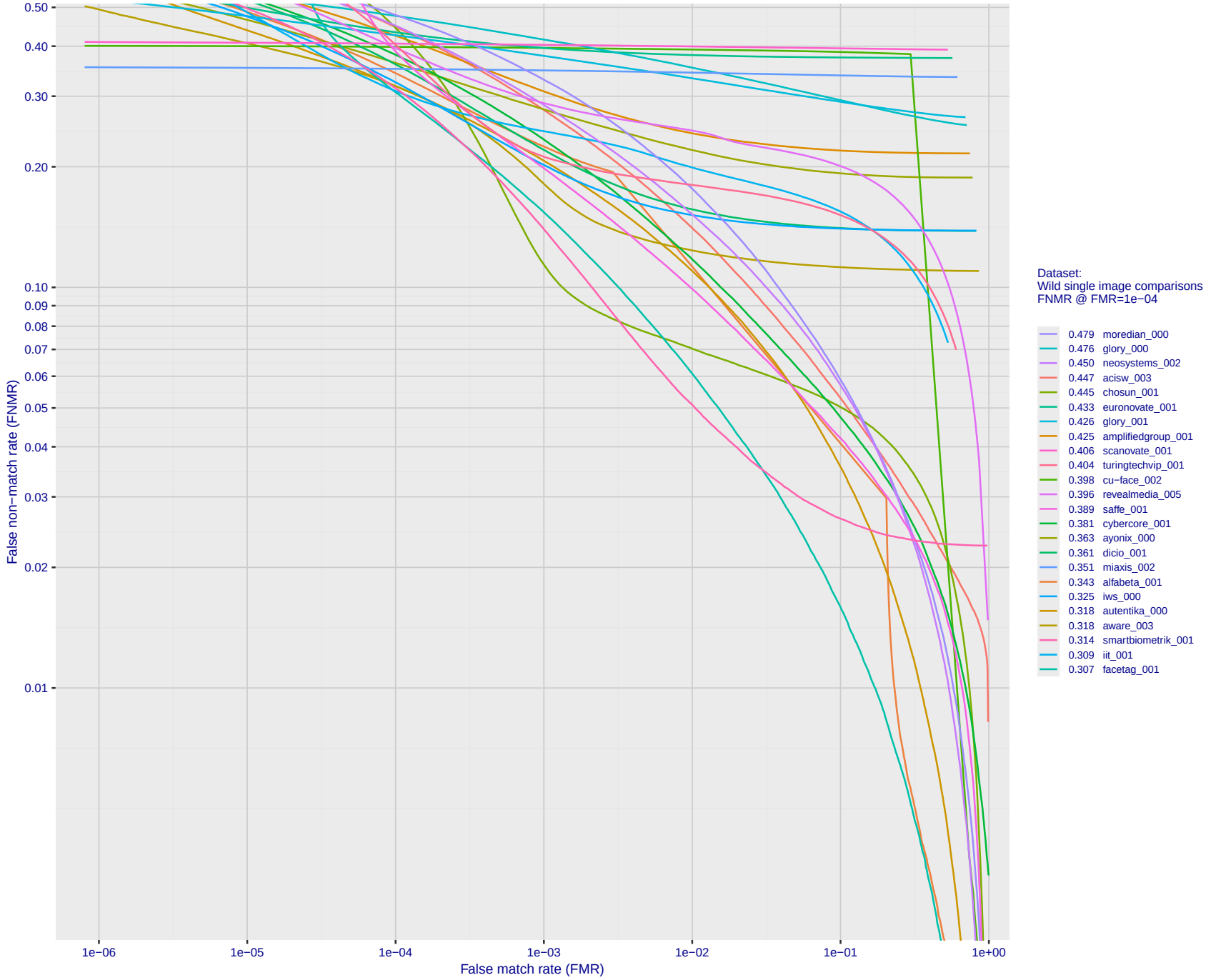

Figure 311: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

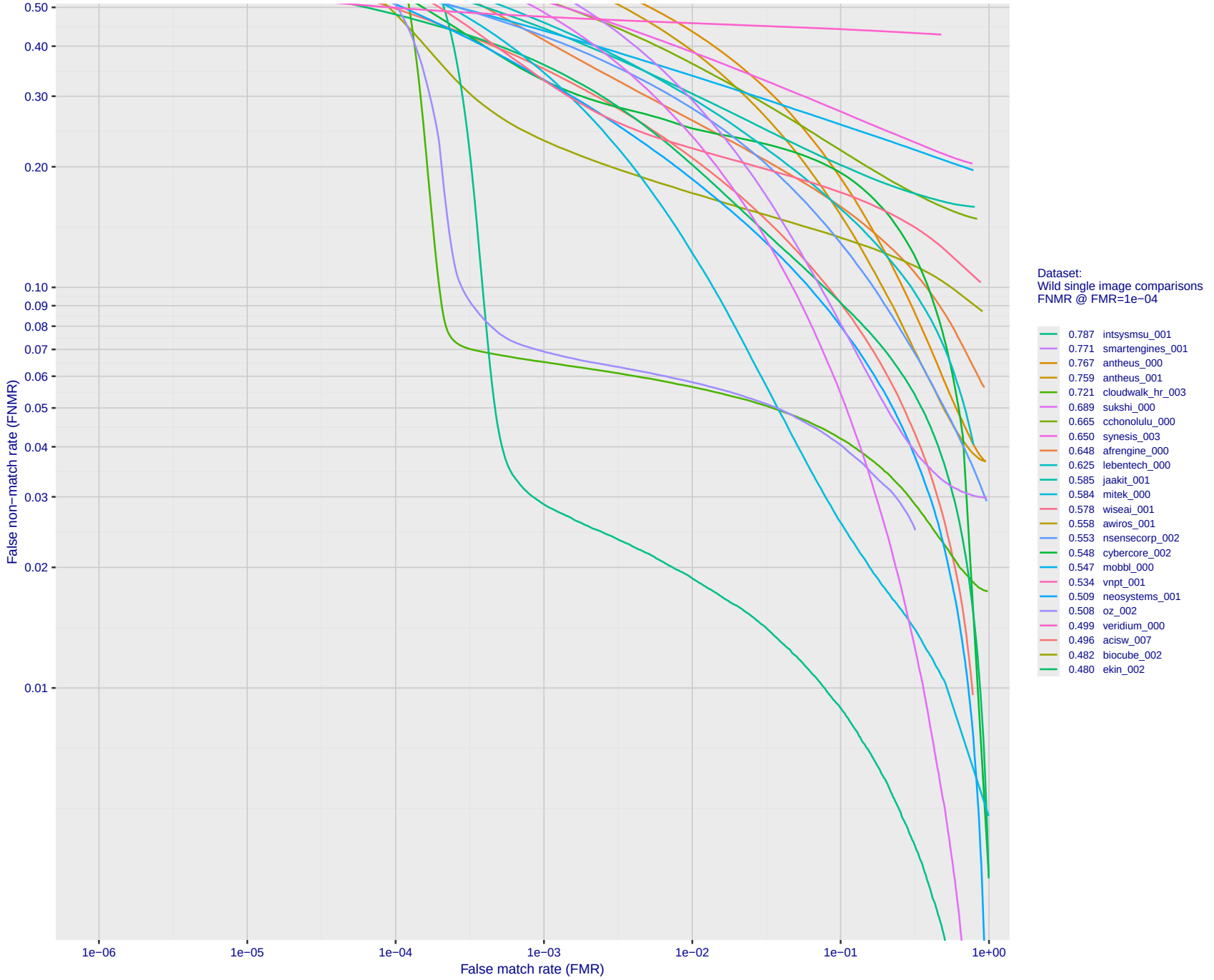

Figure 312: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

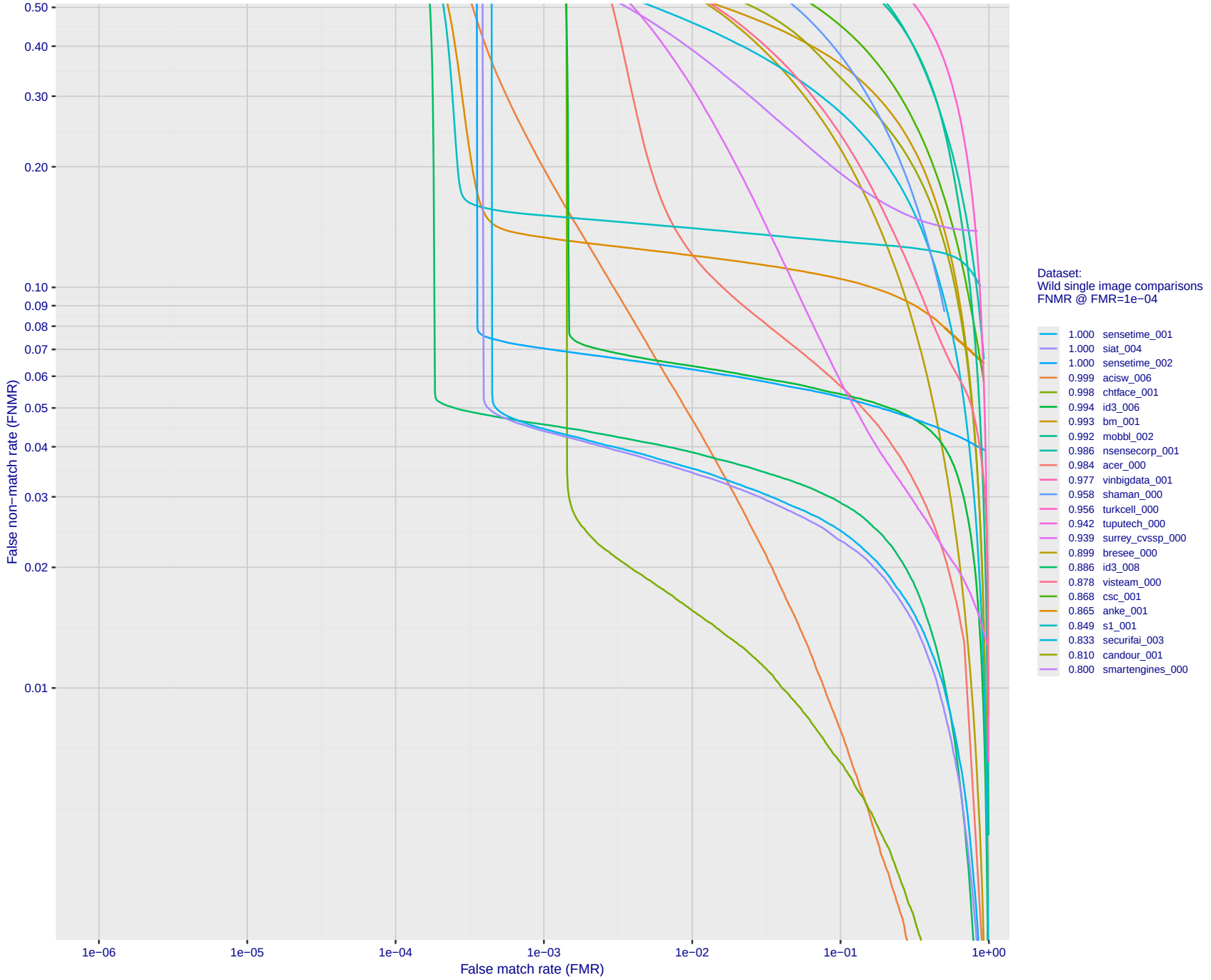

Figure 313: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

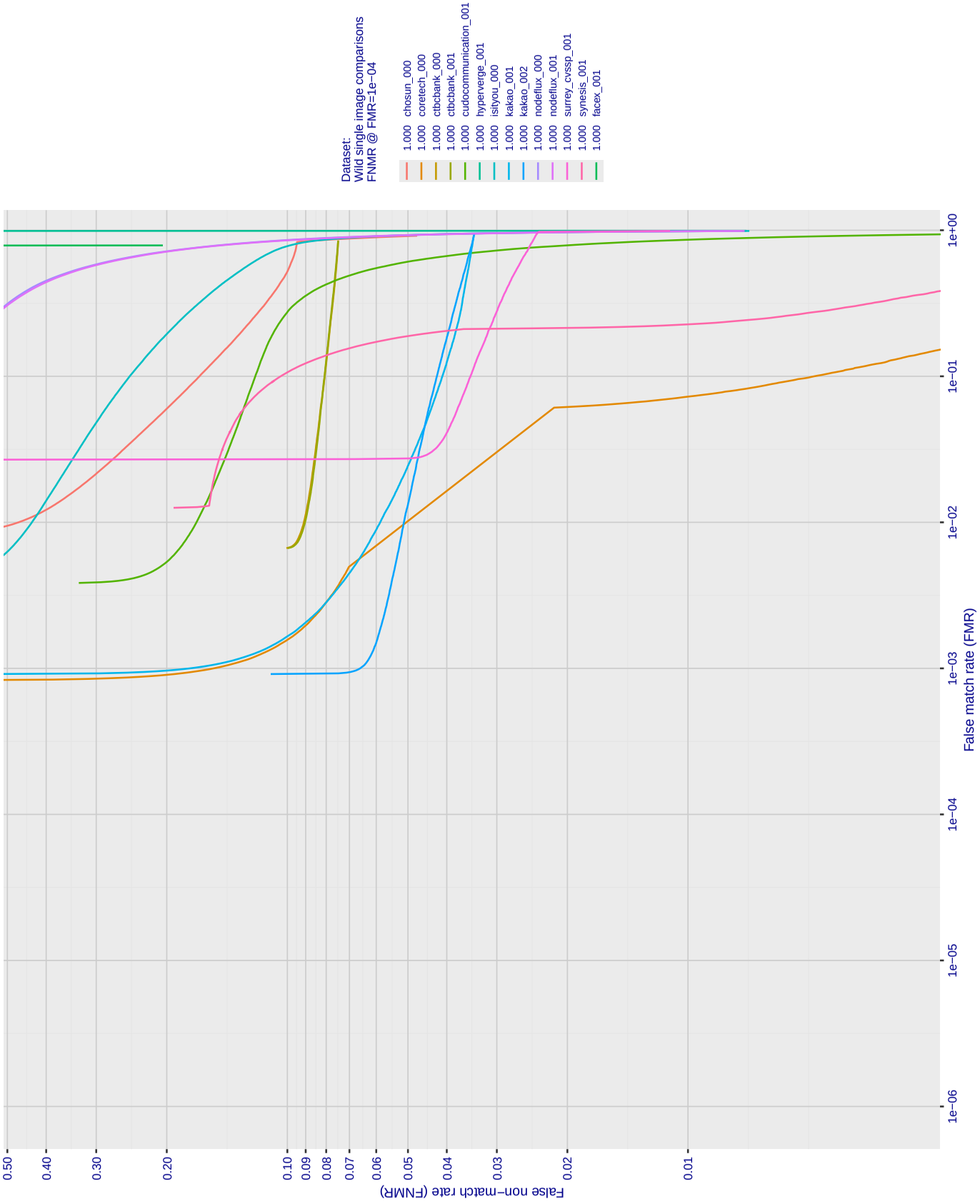

Figure 314: For the 2018 wild image comparisons, detection error tradeoff (DET) characteristics showing false non-match rate vs. false match rate plotted parametrically on threshold, T. The scales are logarithmic in order to show several decades of FMR.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

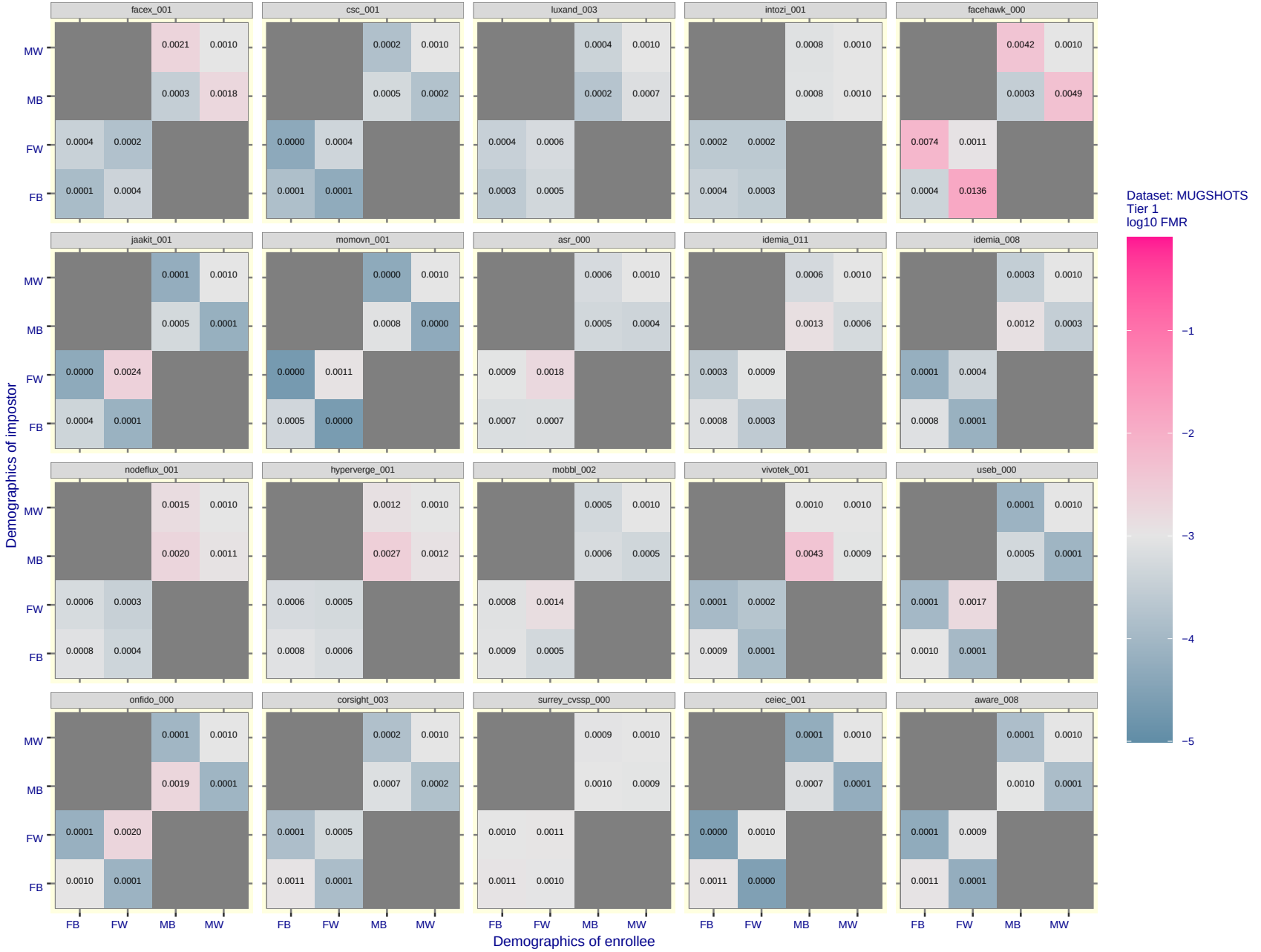

Figure 315: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

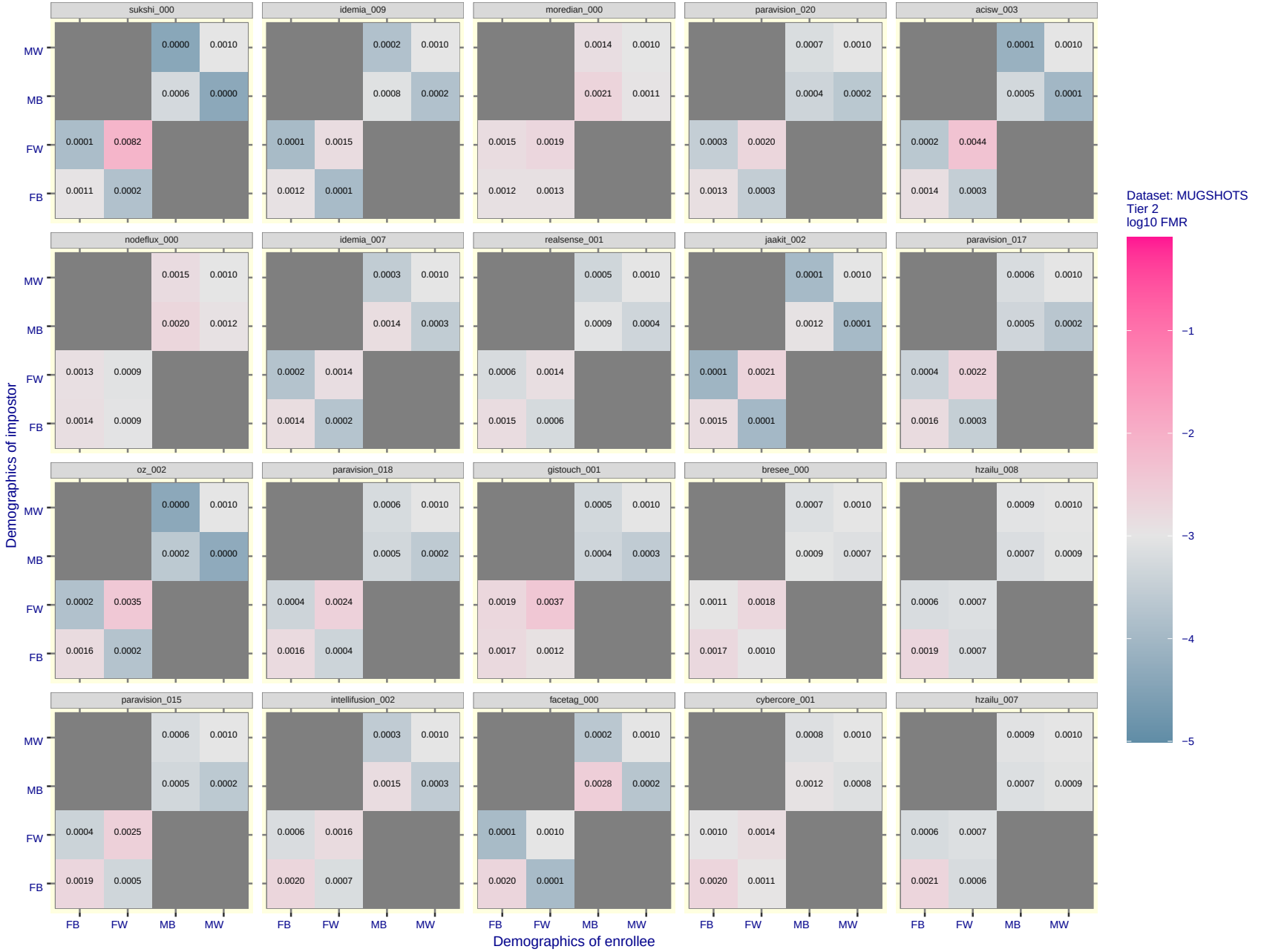

Figure 316: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

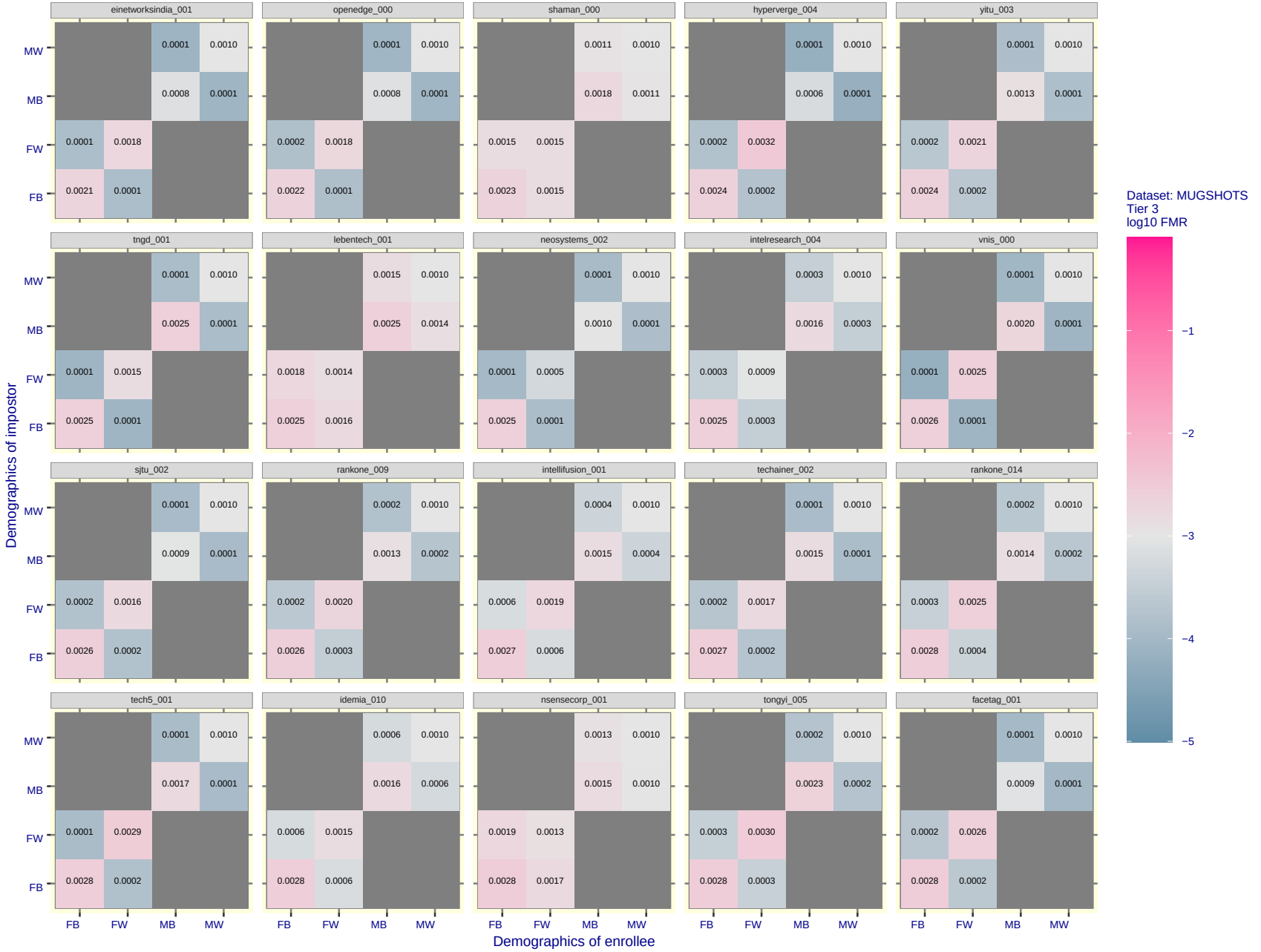

Figure 317: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

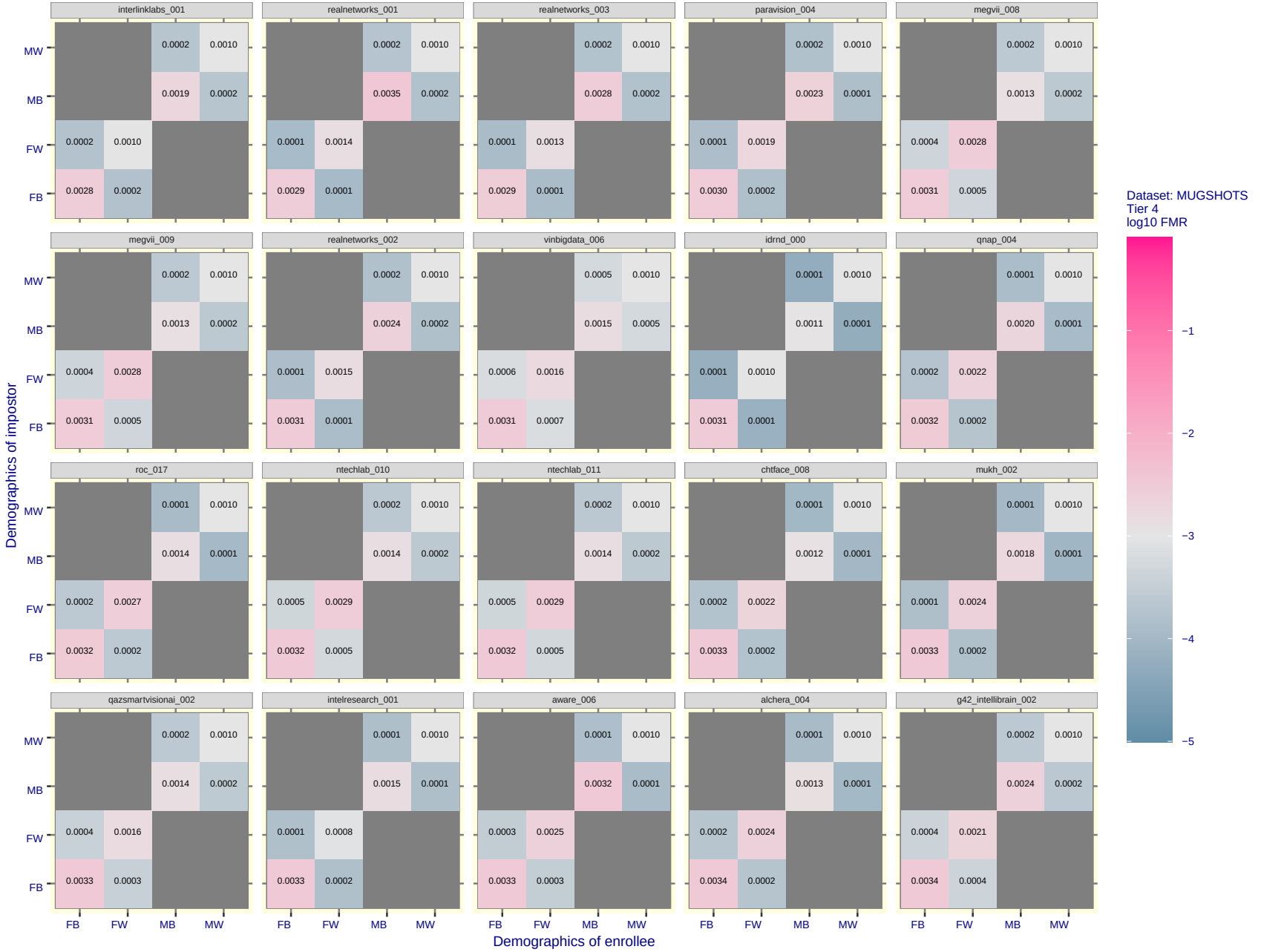

Figure 318: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

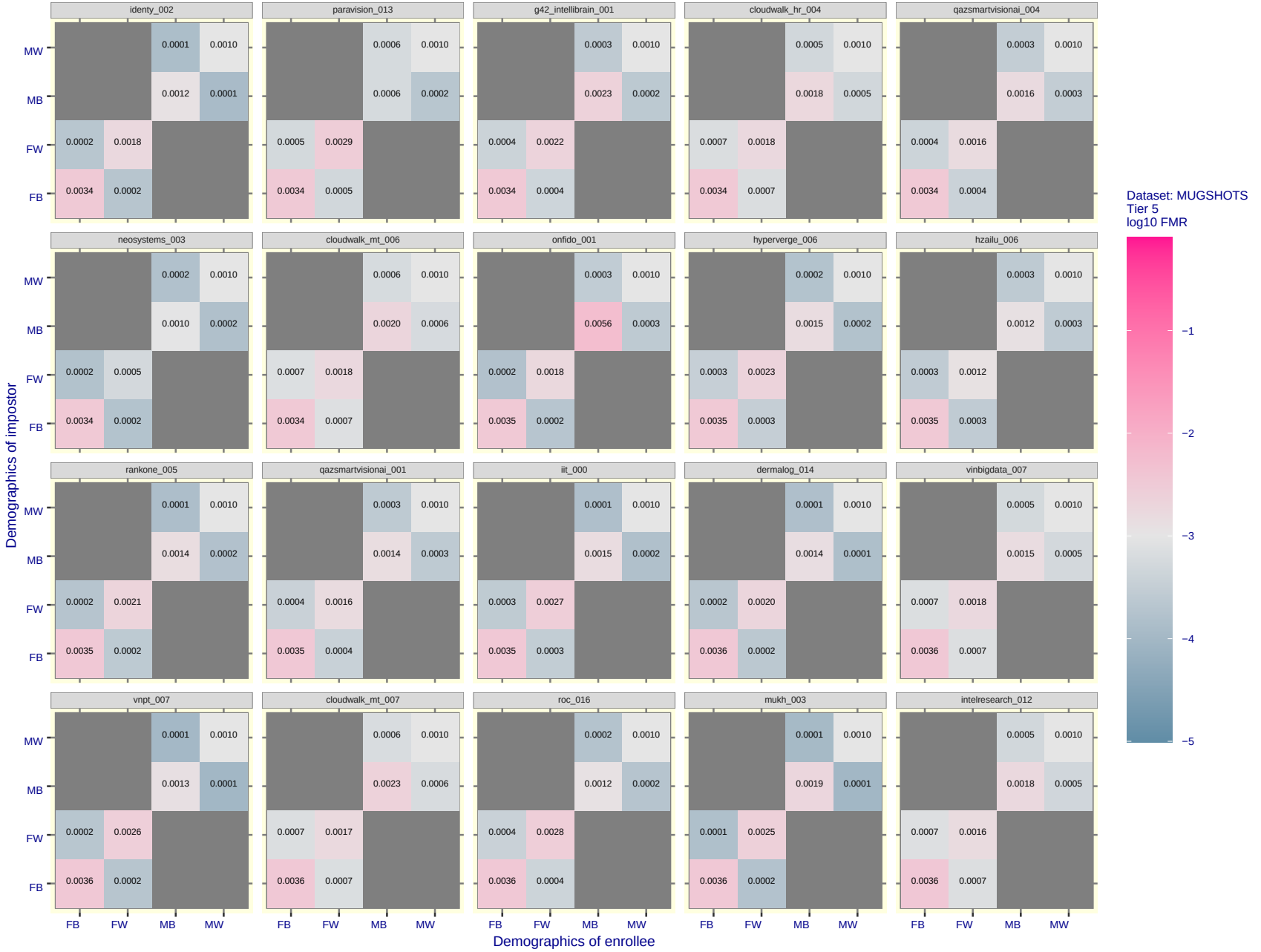

Figure 319: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

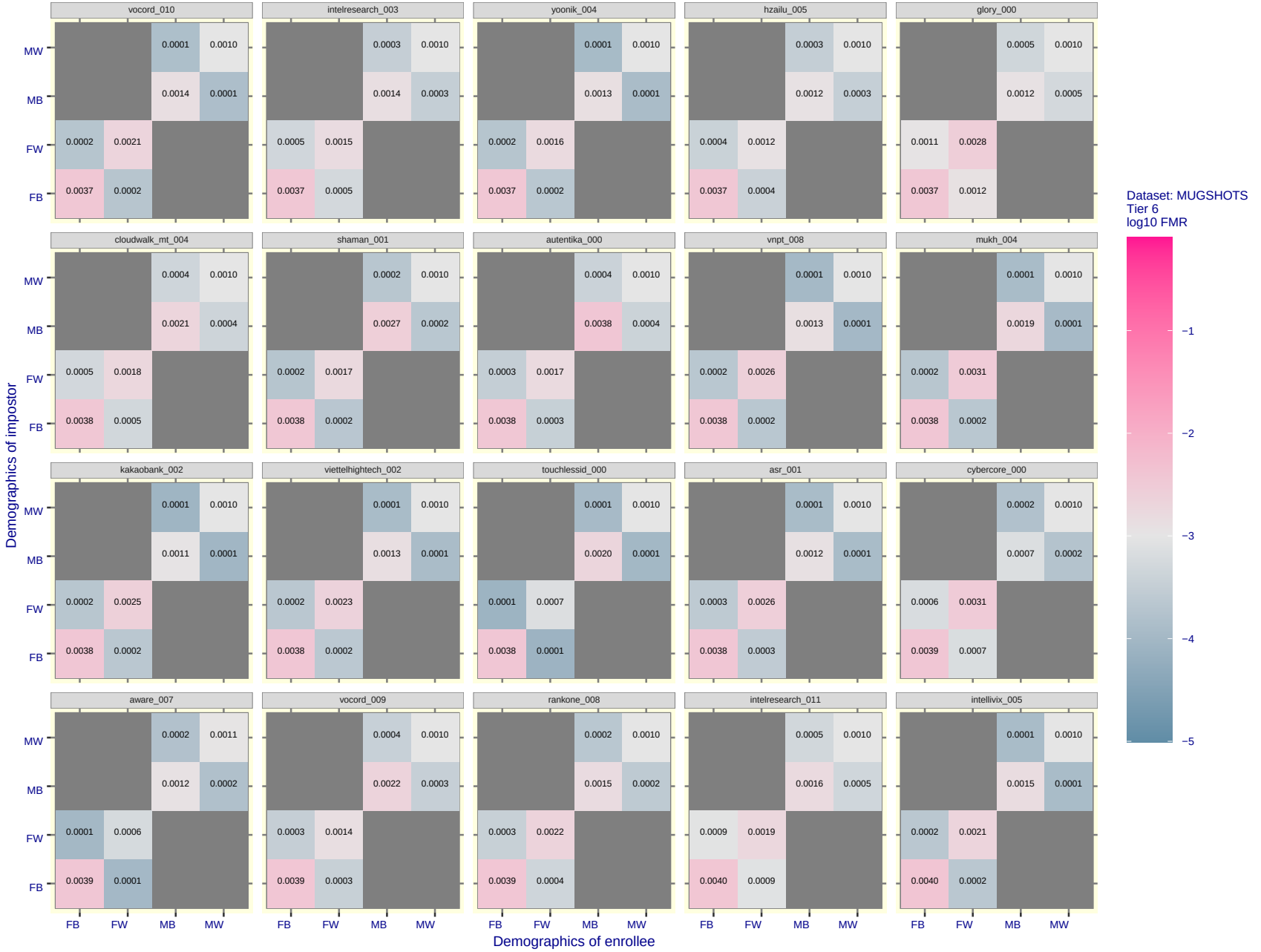

Figure 320: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

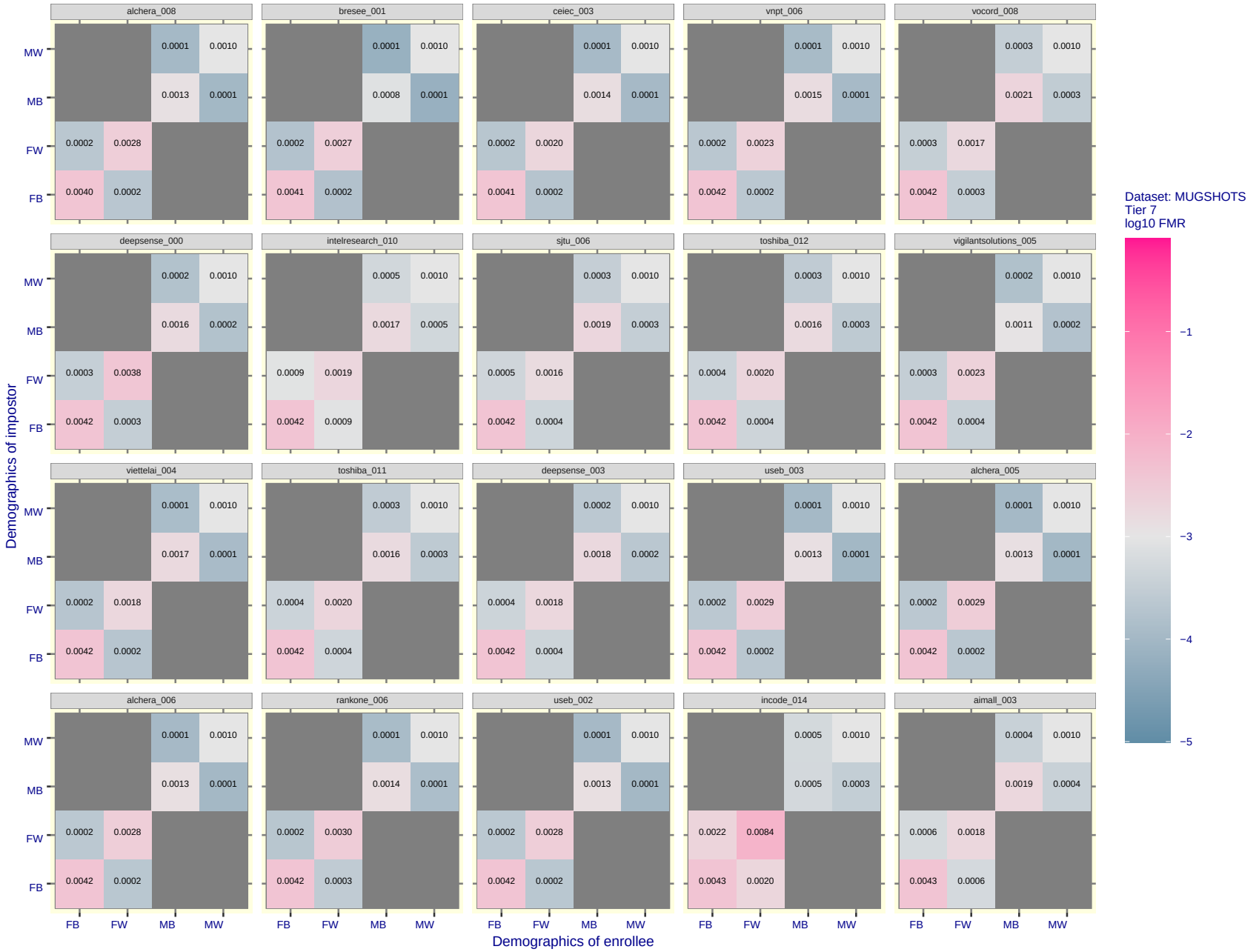

Figure 321: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

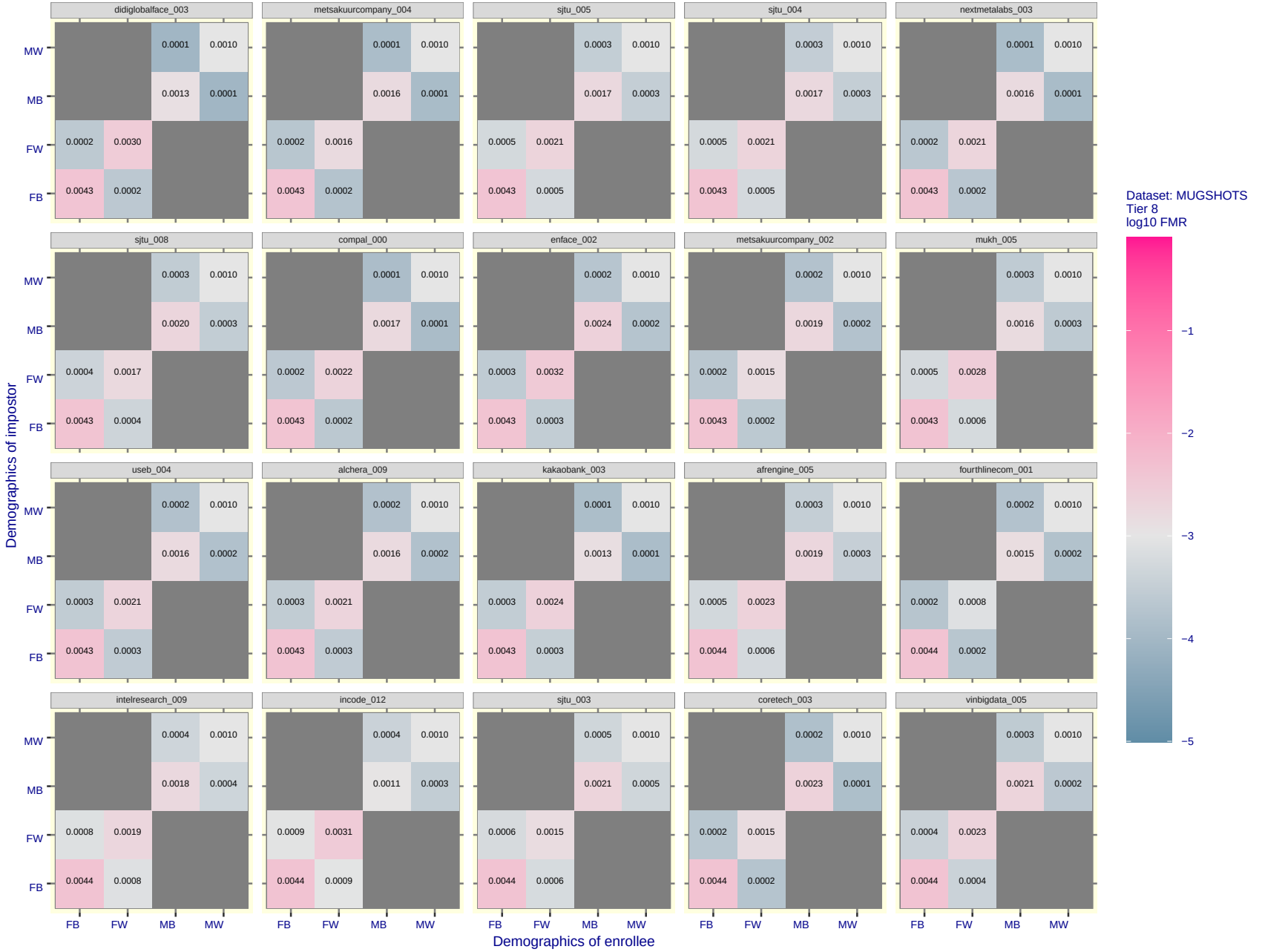

Figure 322: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

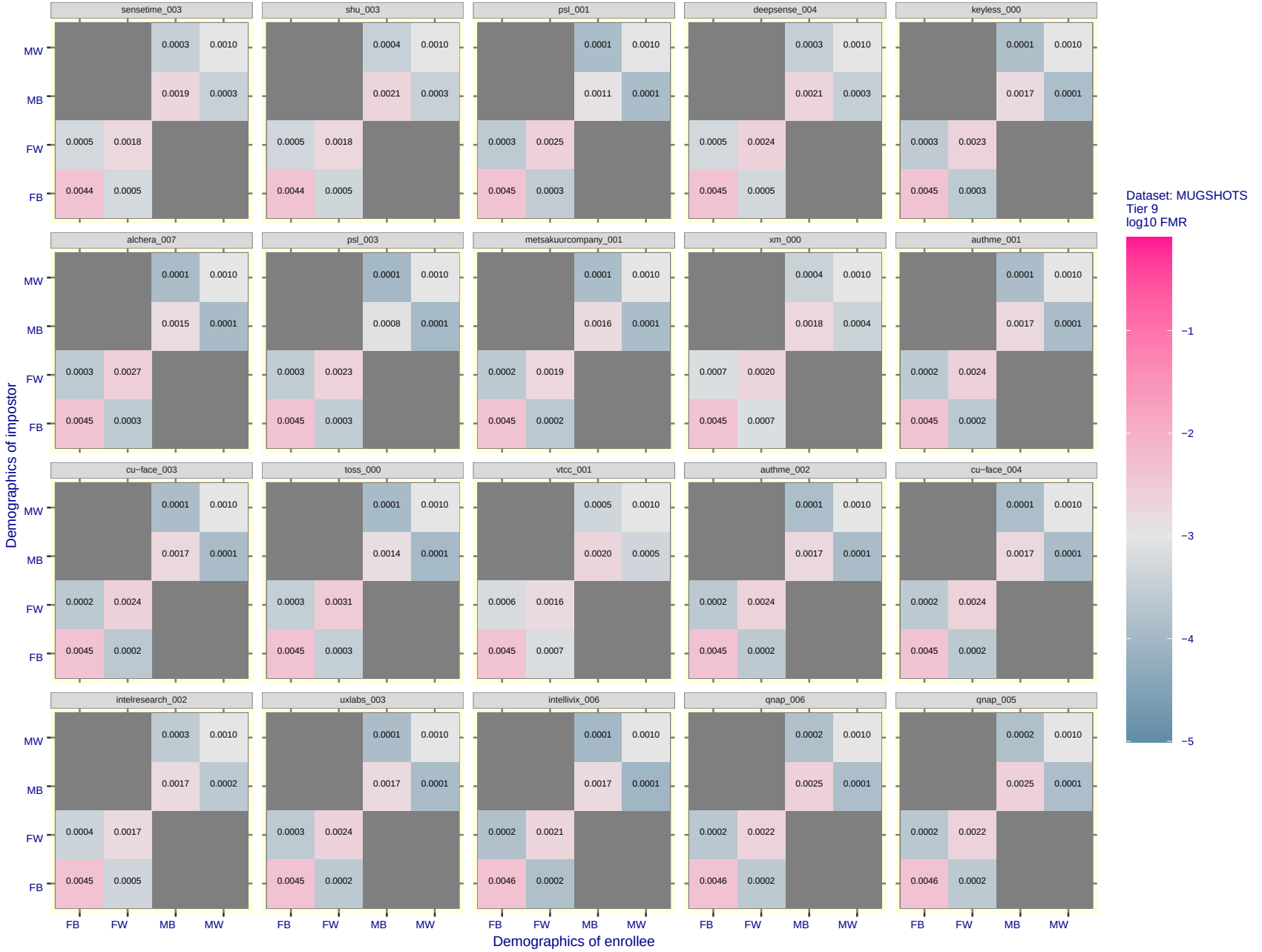

Figure 323: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

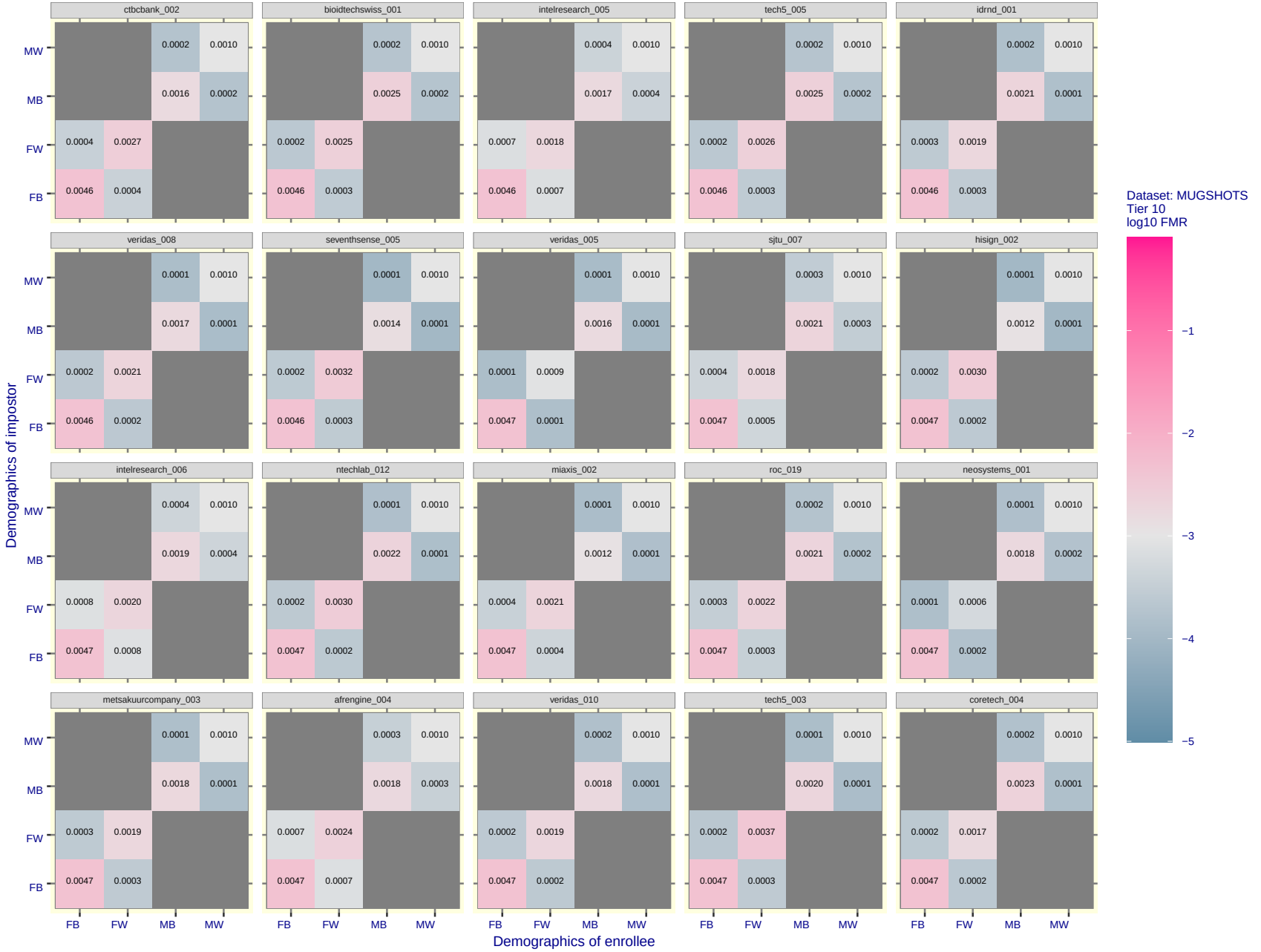

Figure 324: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

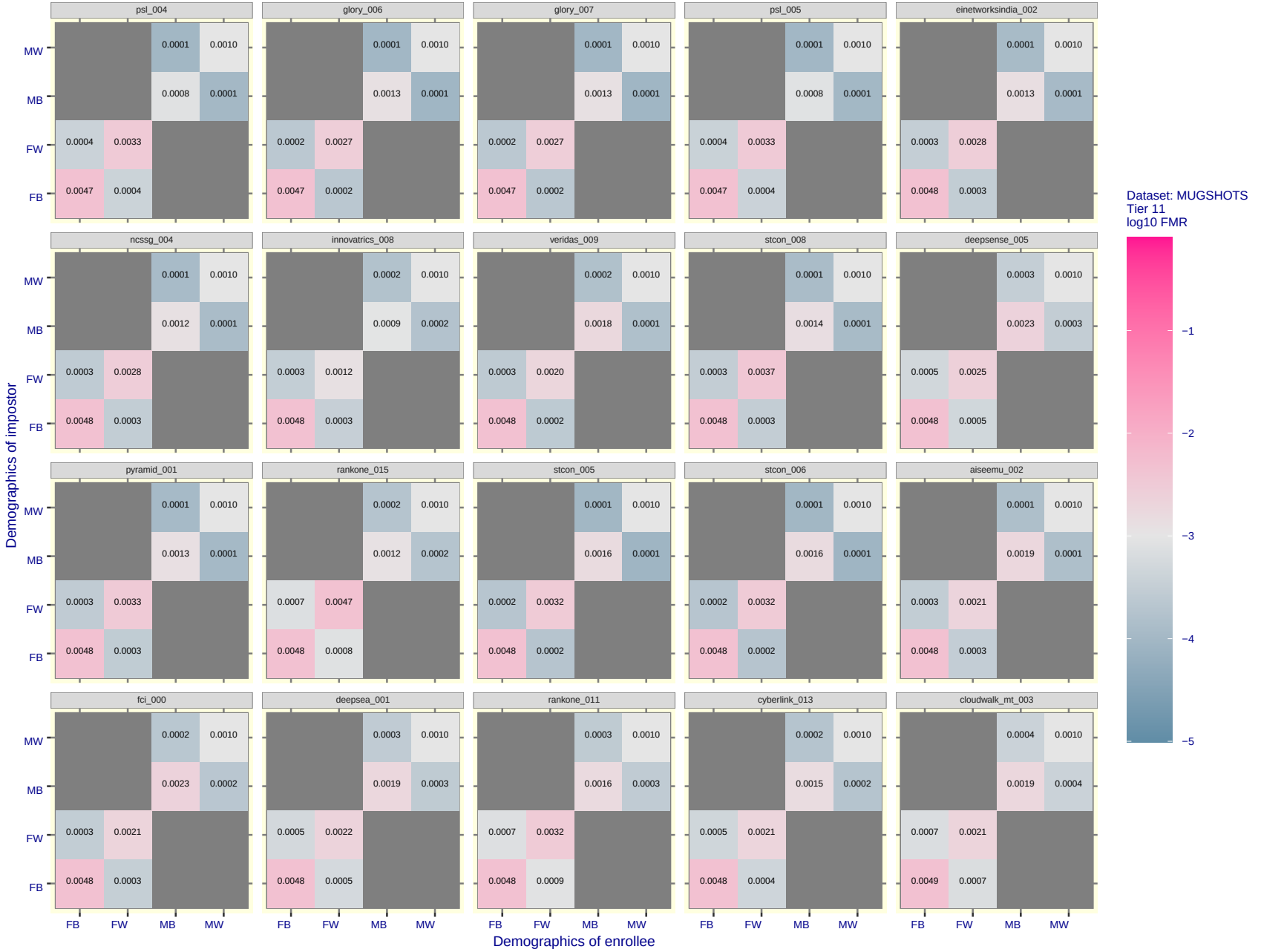

Figure 325: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

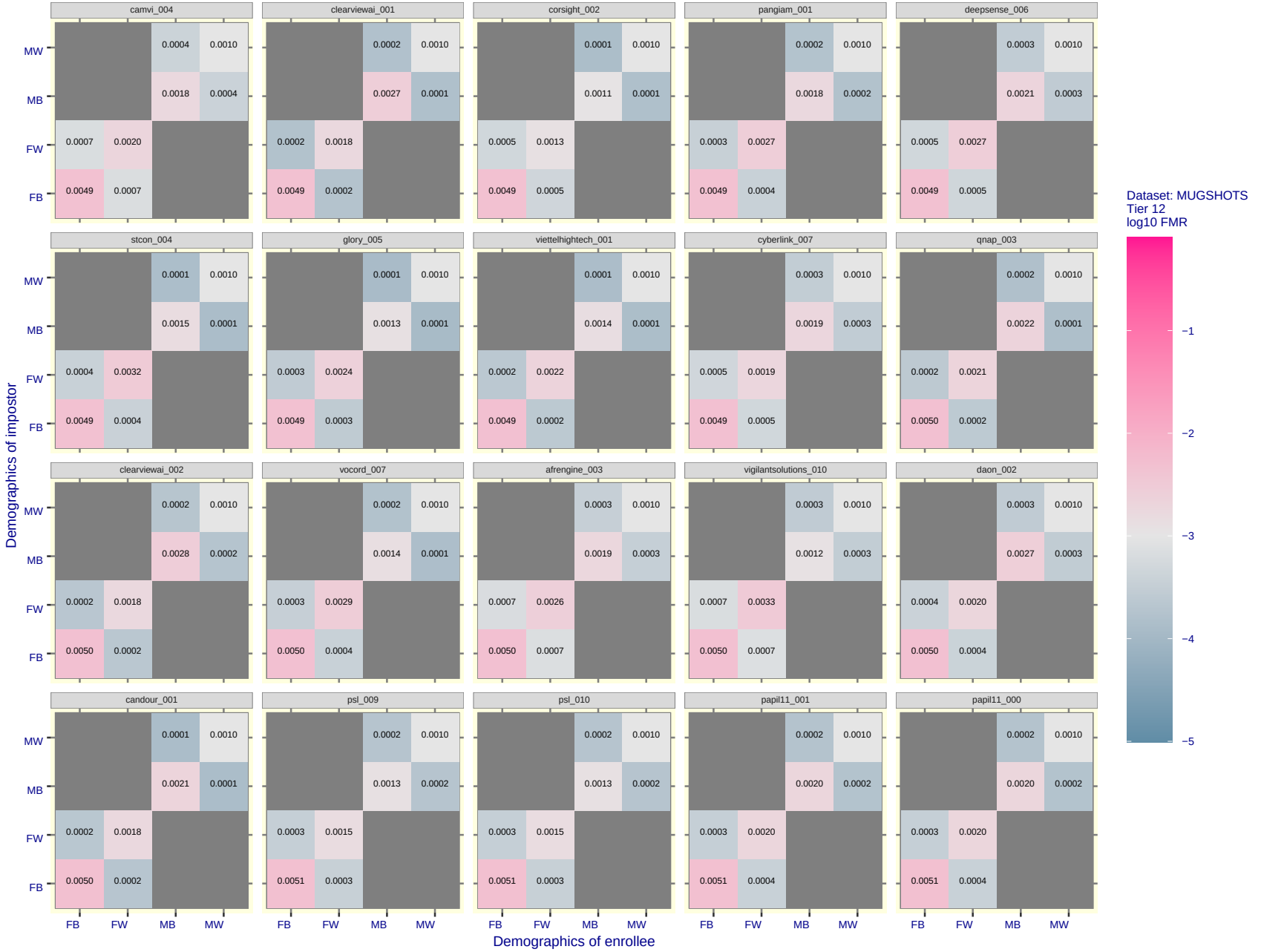

Figure 326: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

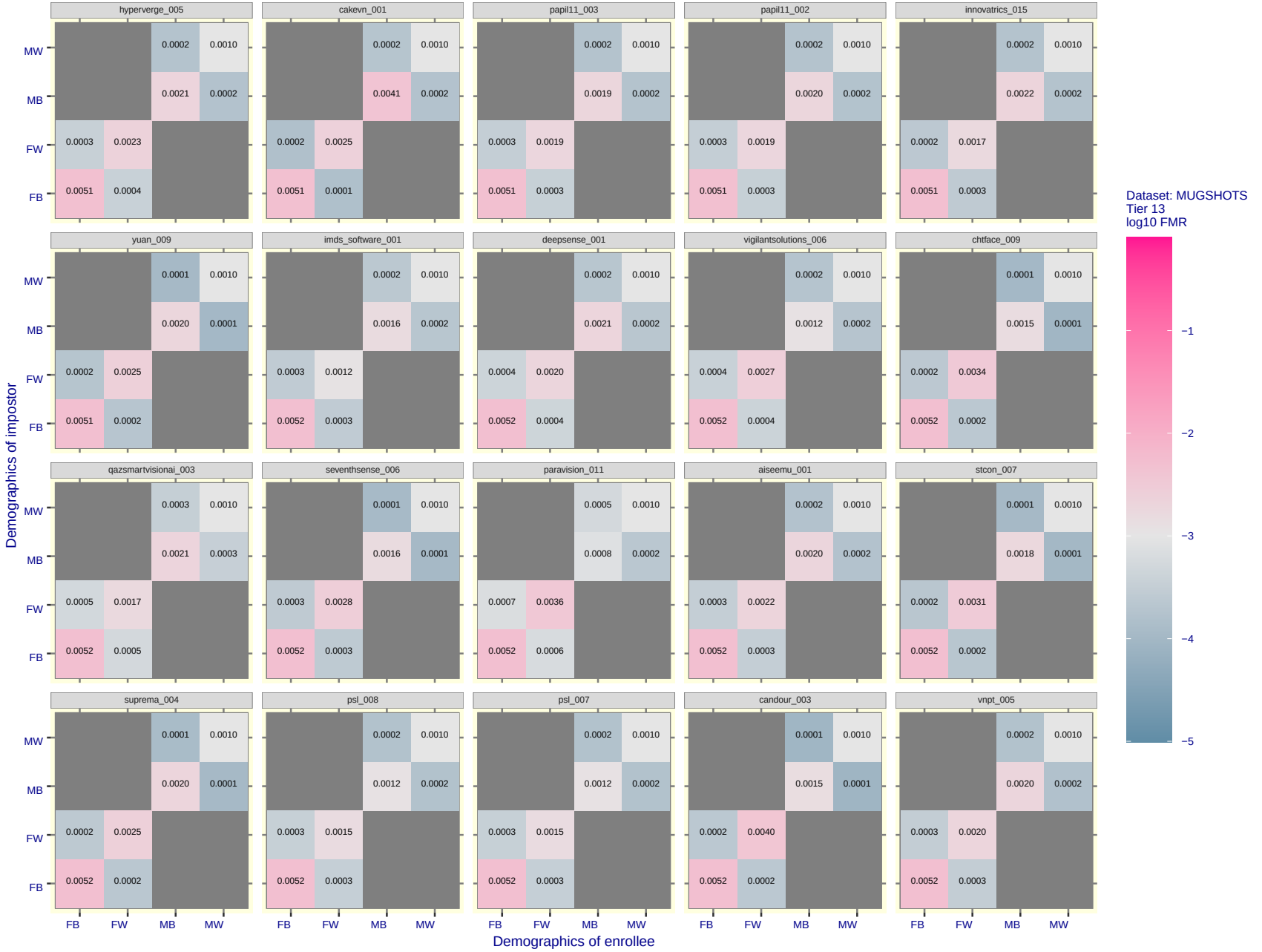

Figure 327: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

2026/01/23 11:36:01

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

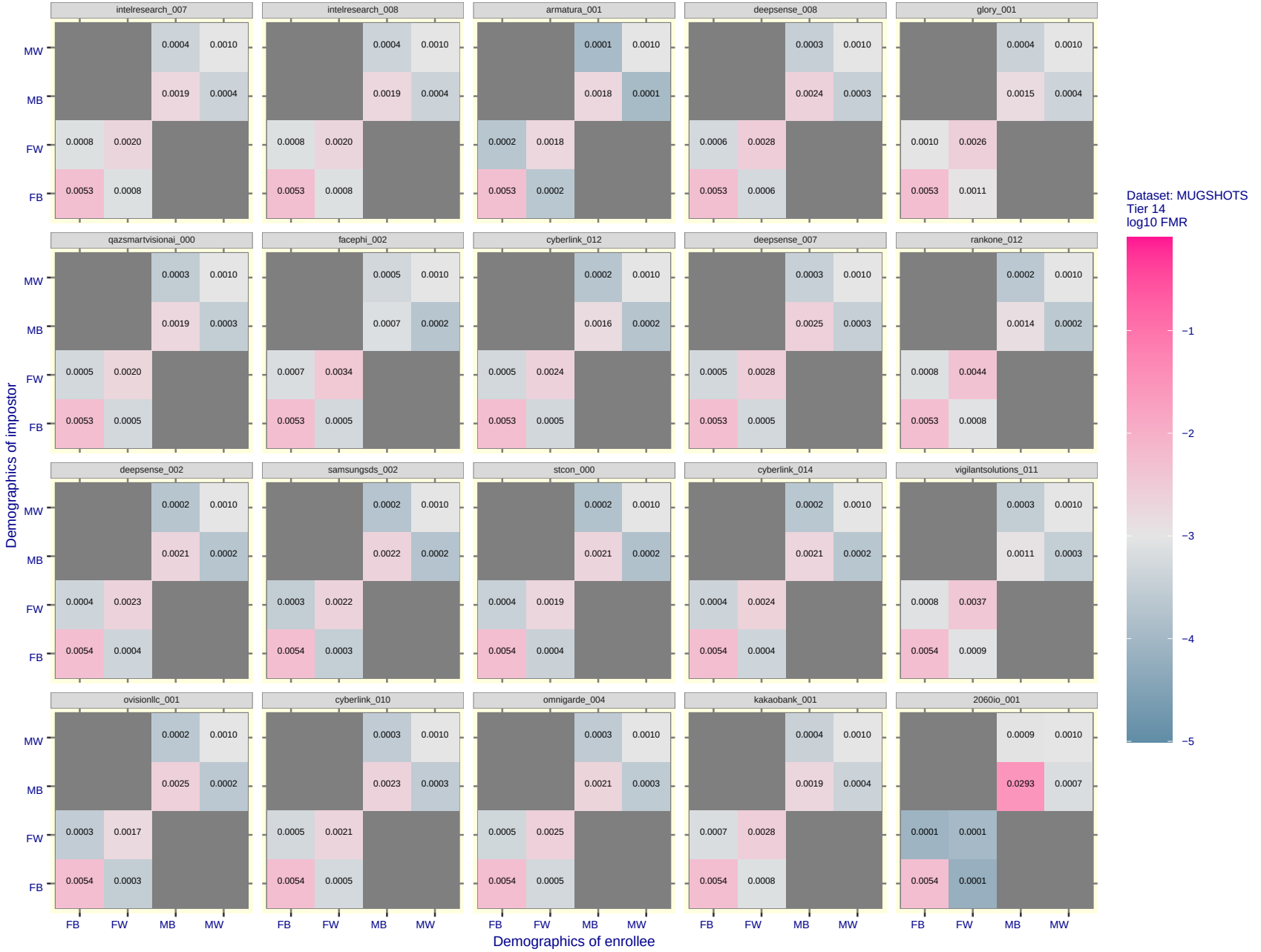

Figure 328: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

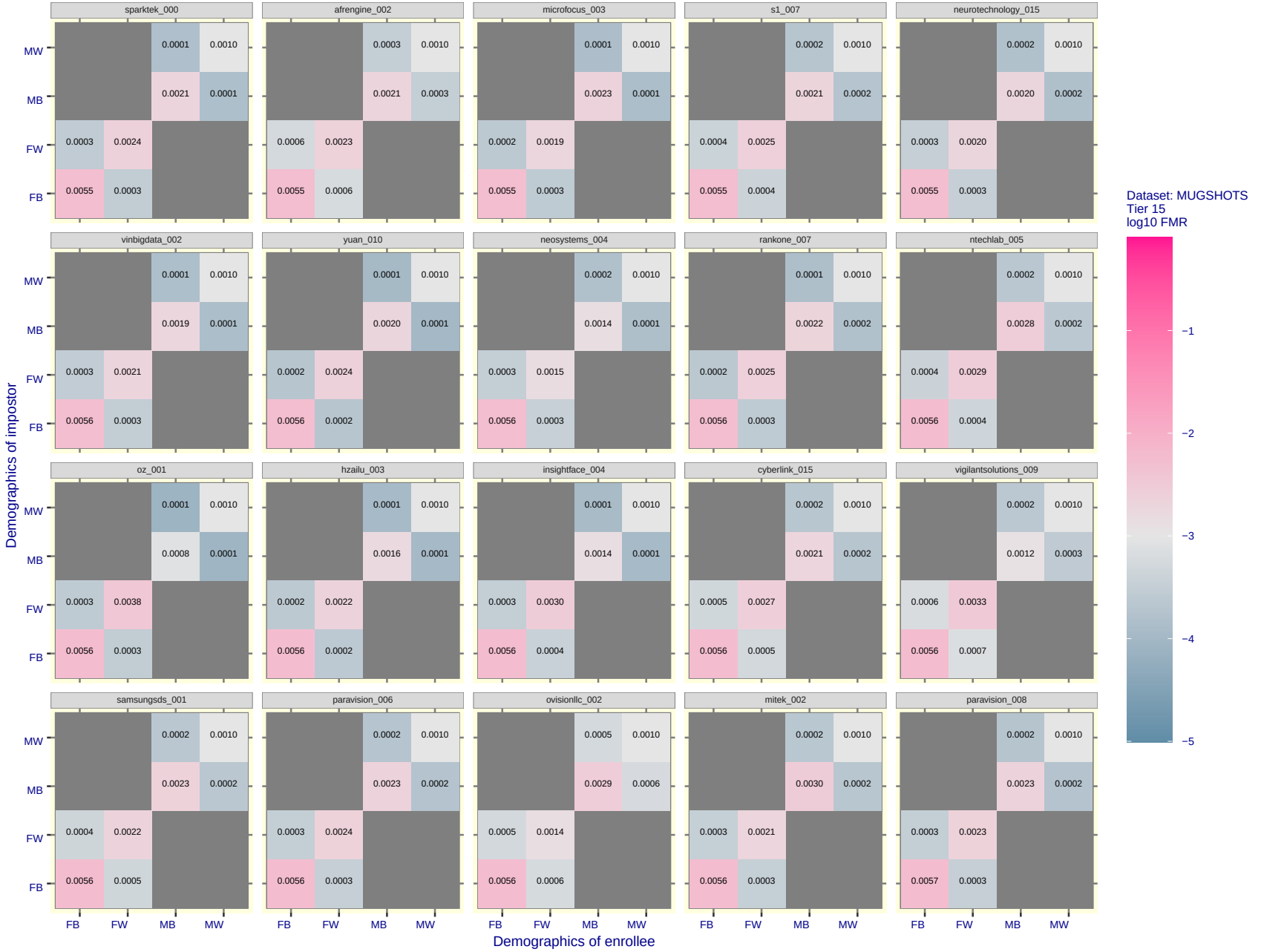

Figure 329: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

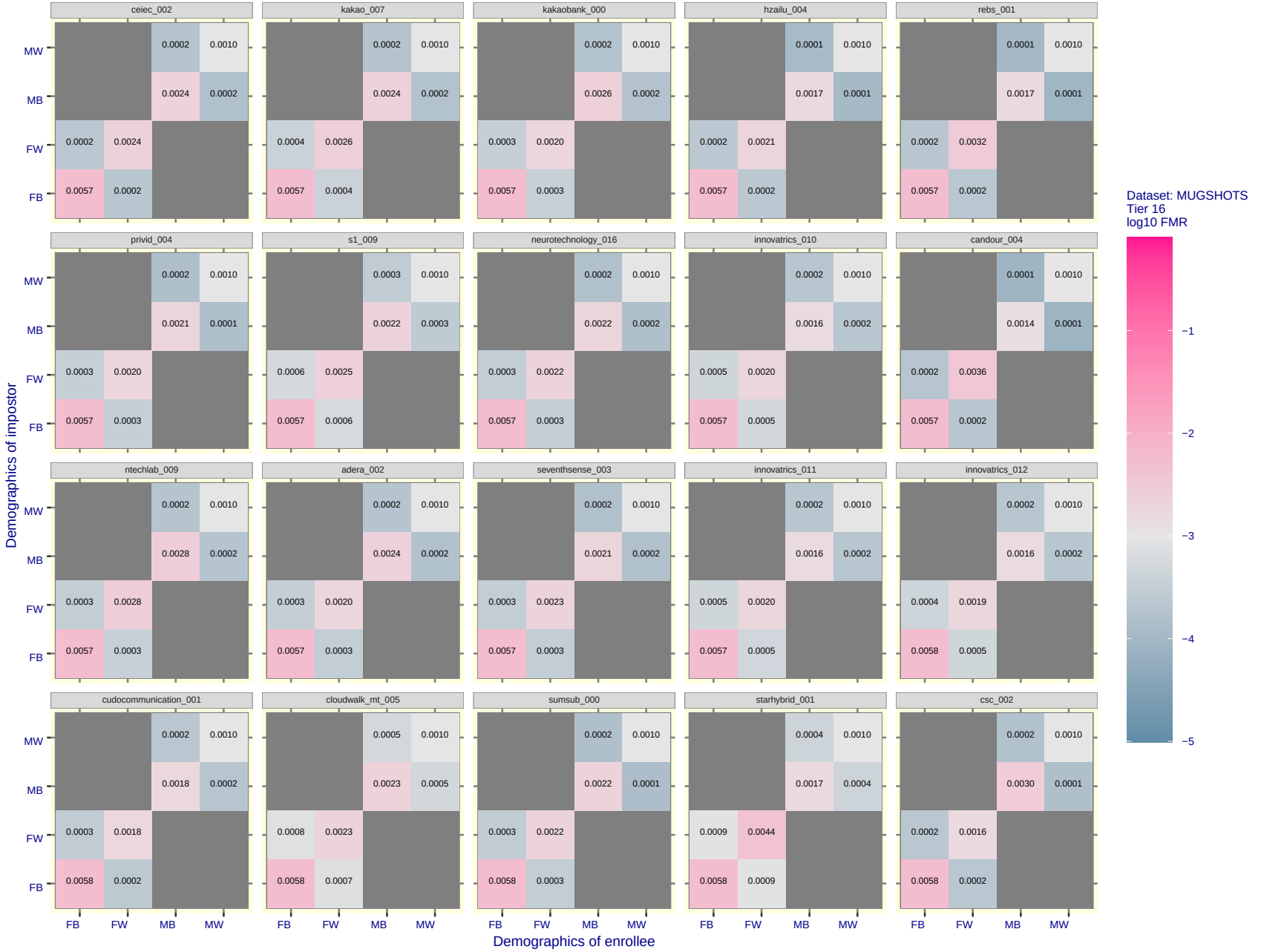

Figure 330: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

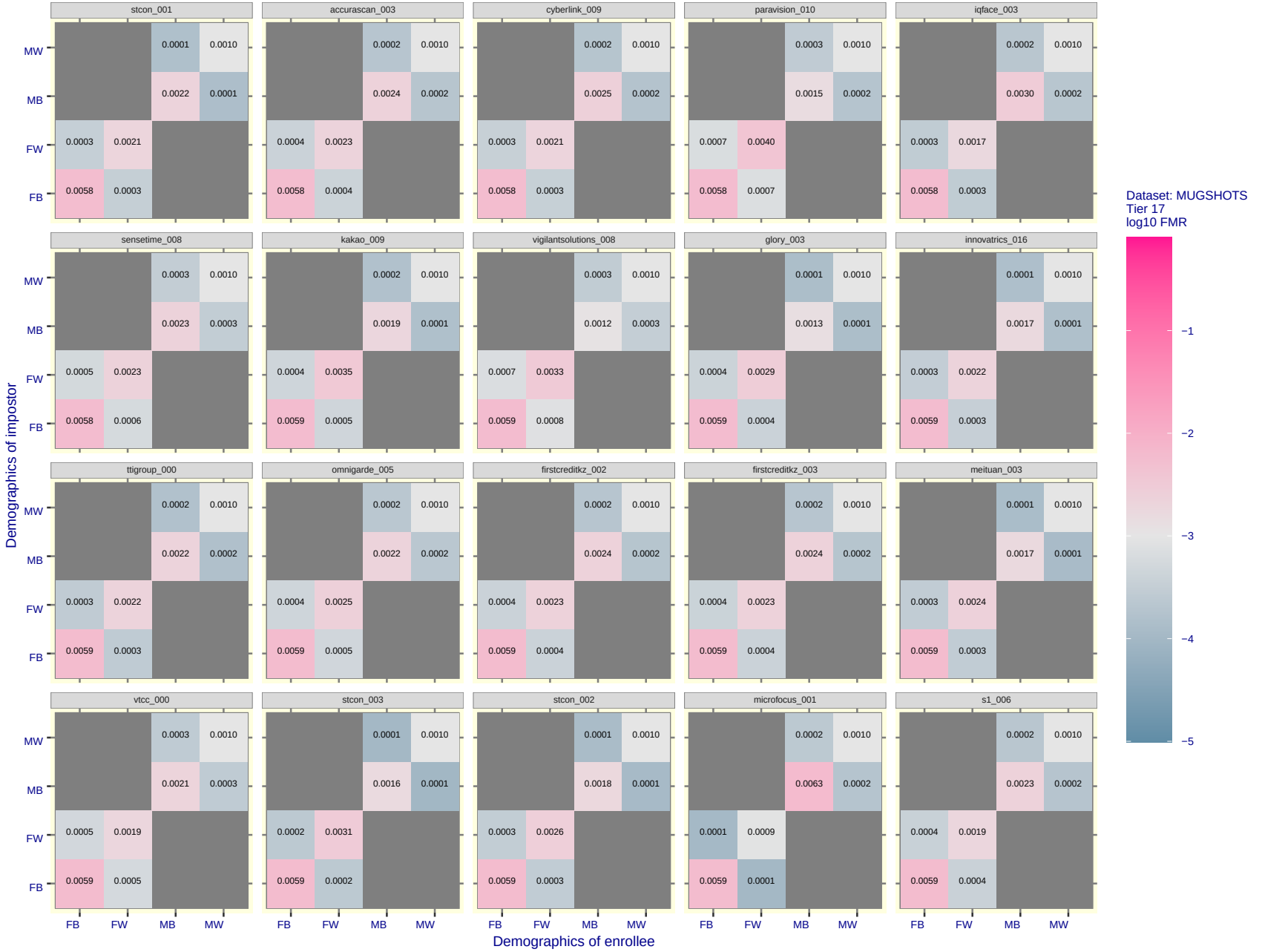

Figure 331: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

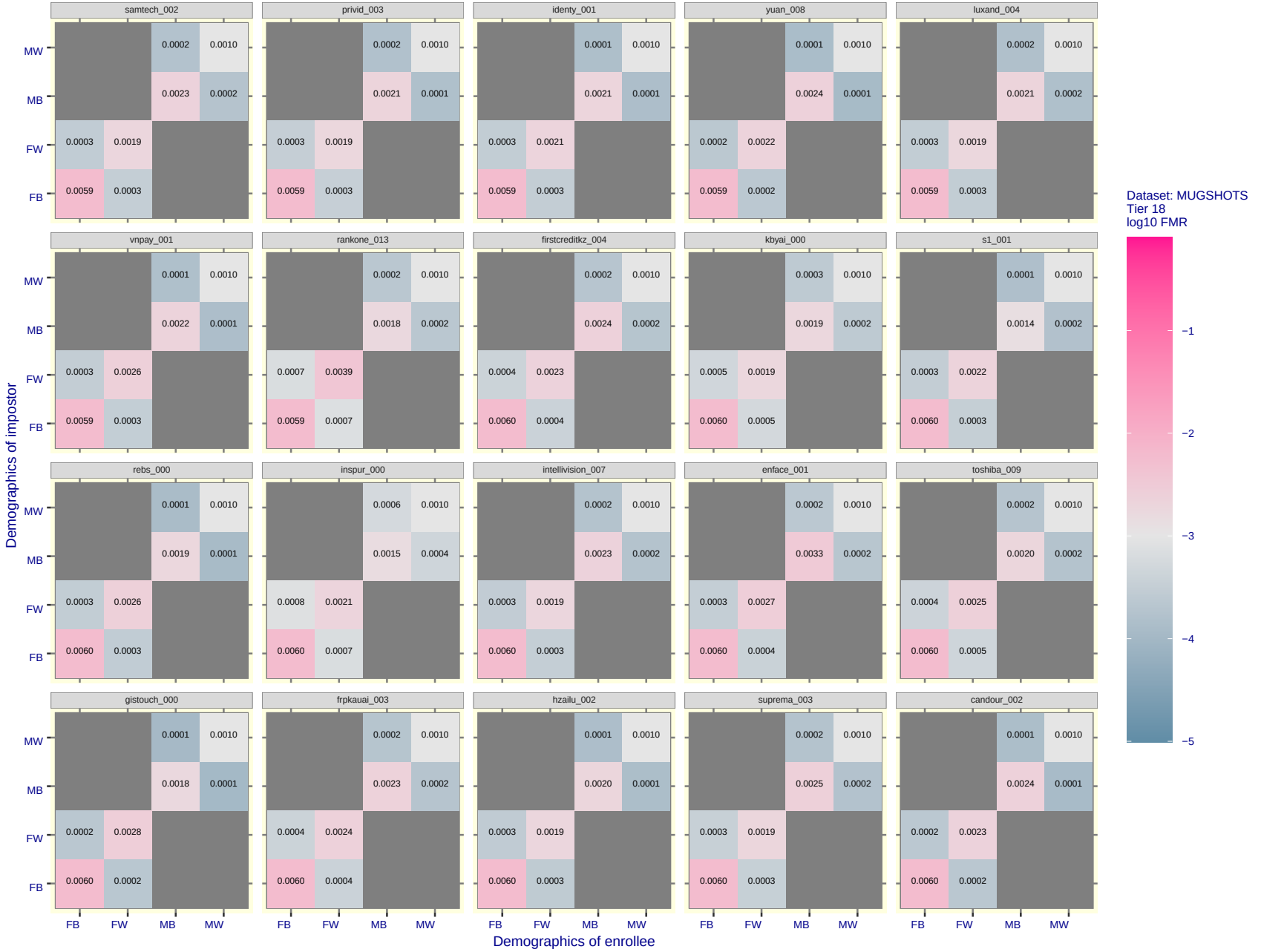

Figure 332: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

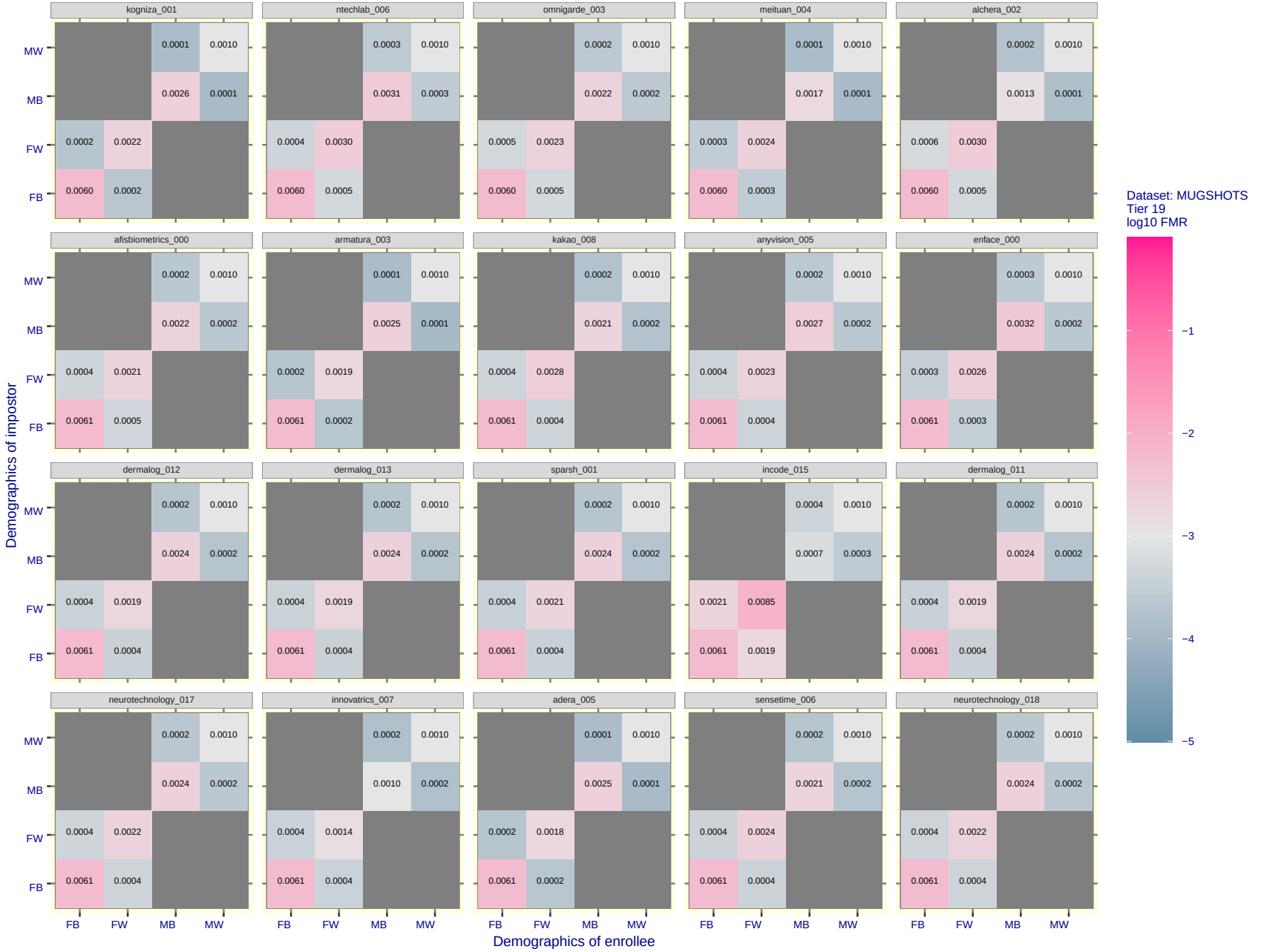

Figure 333: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

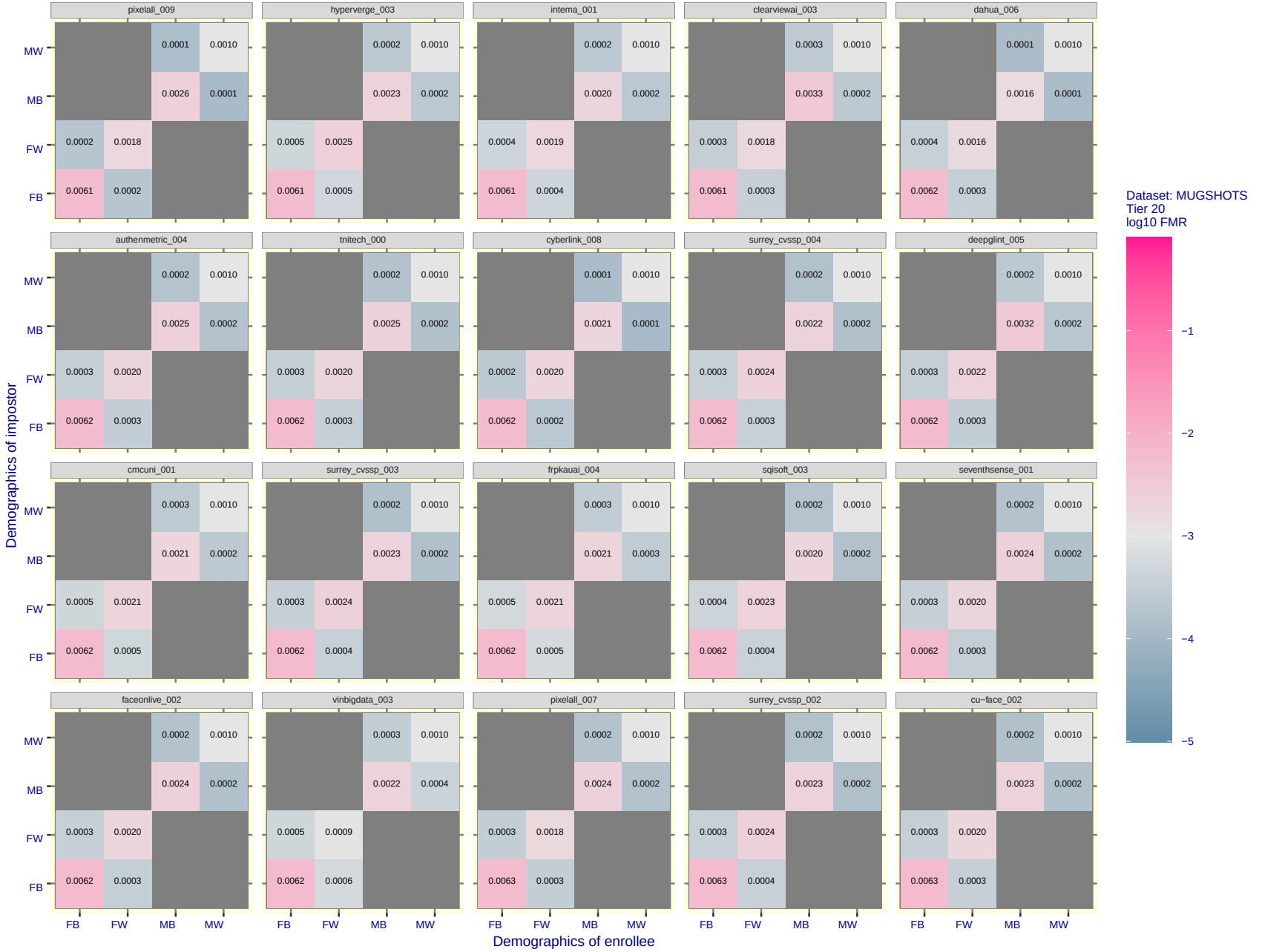

Figure 334: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

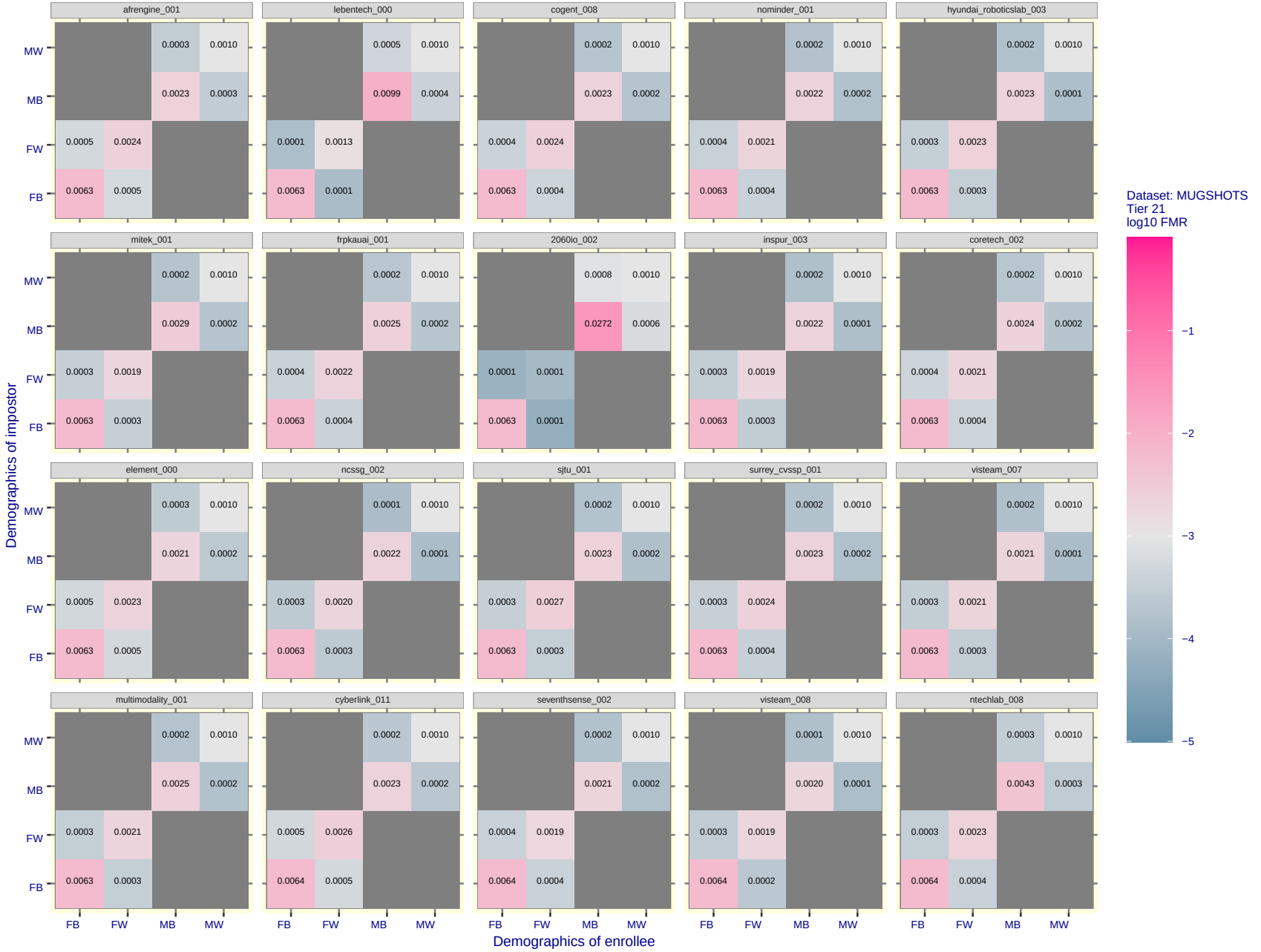

Figure 335: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

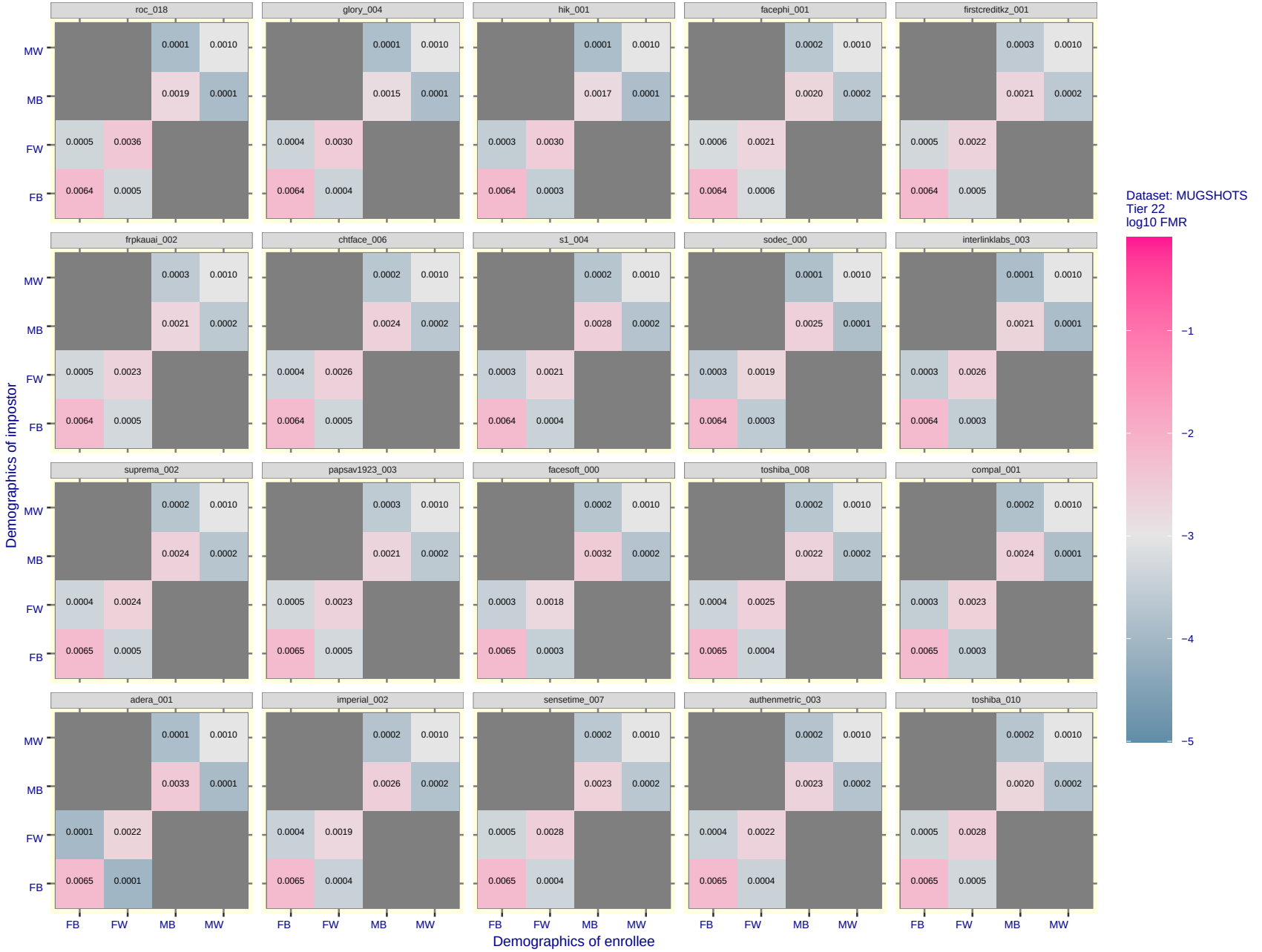

Figure 336: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

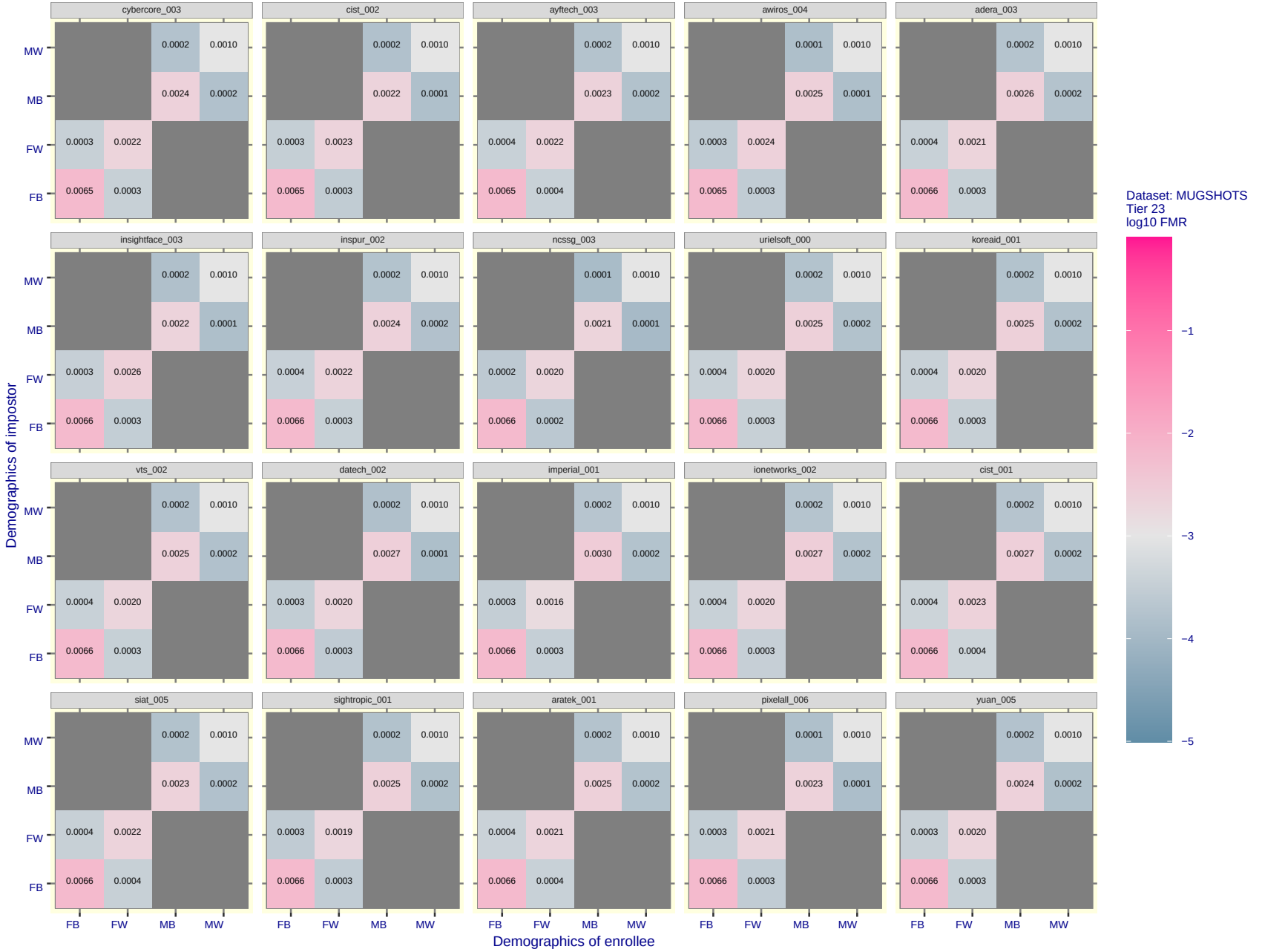

Figure 337: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

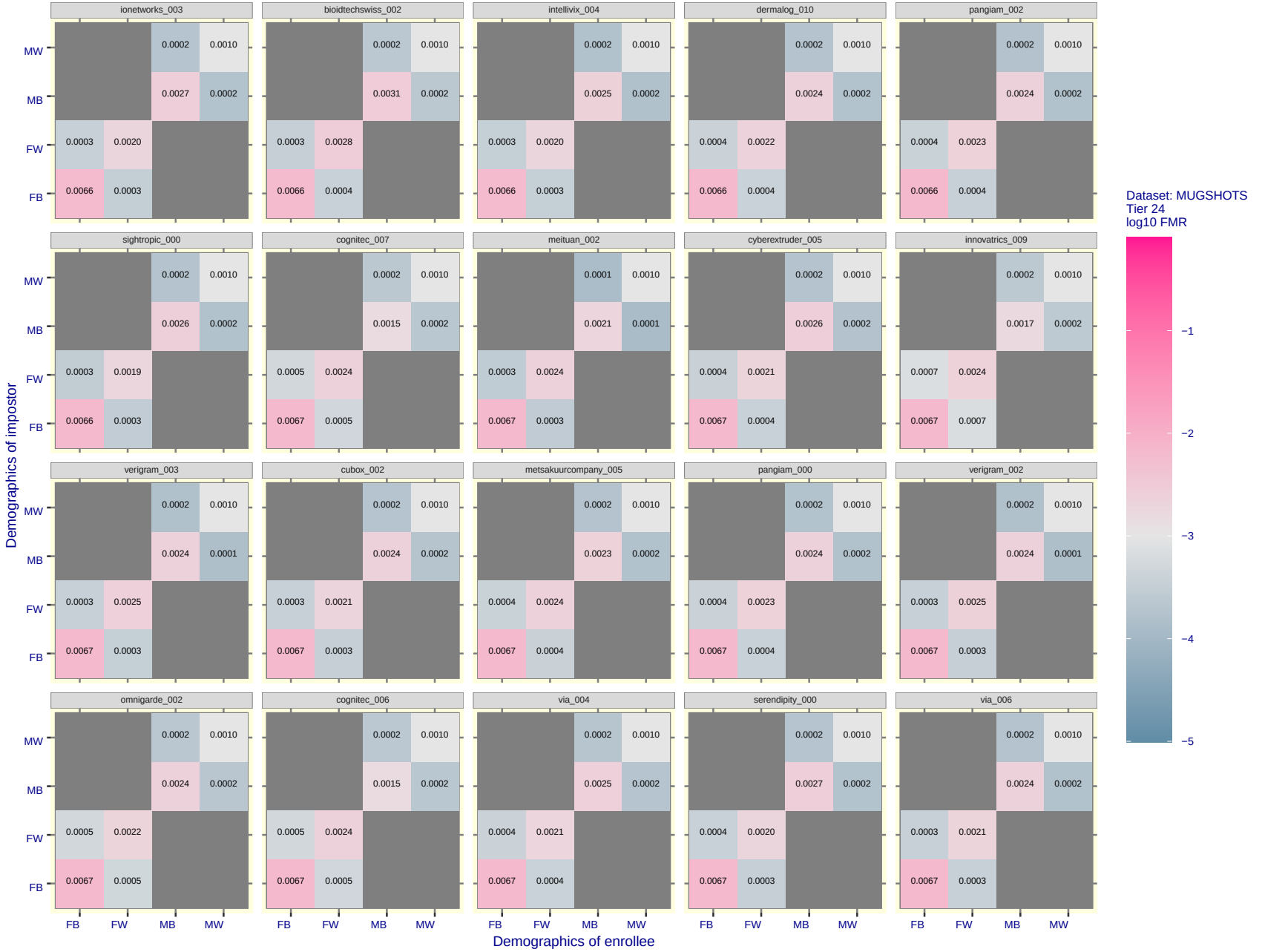

Figure 338: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

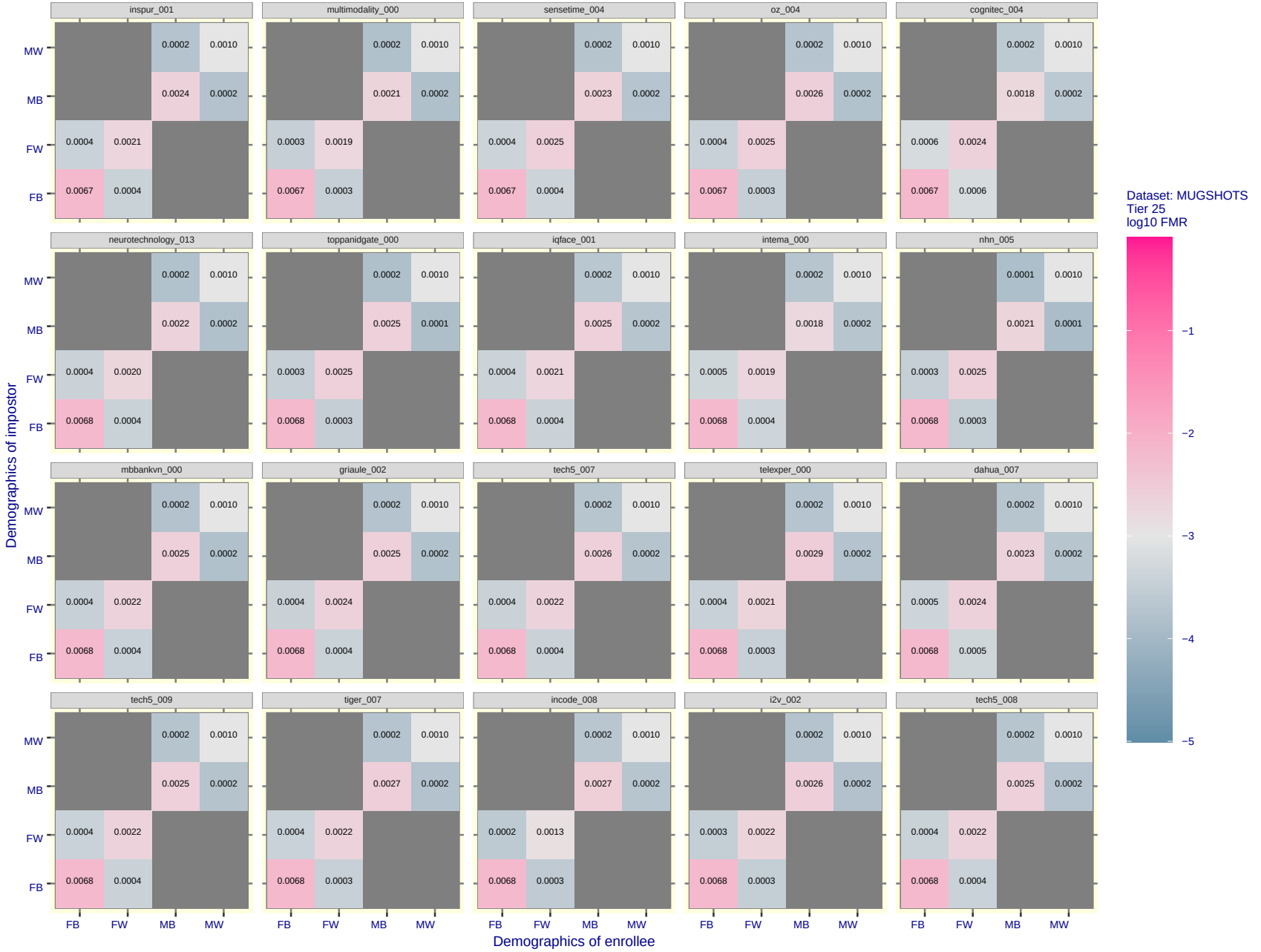

Figure 339: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

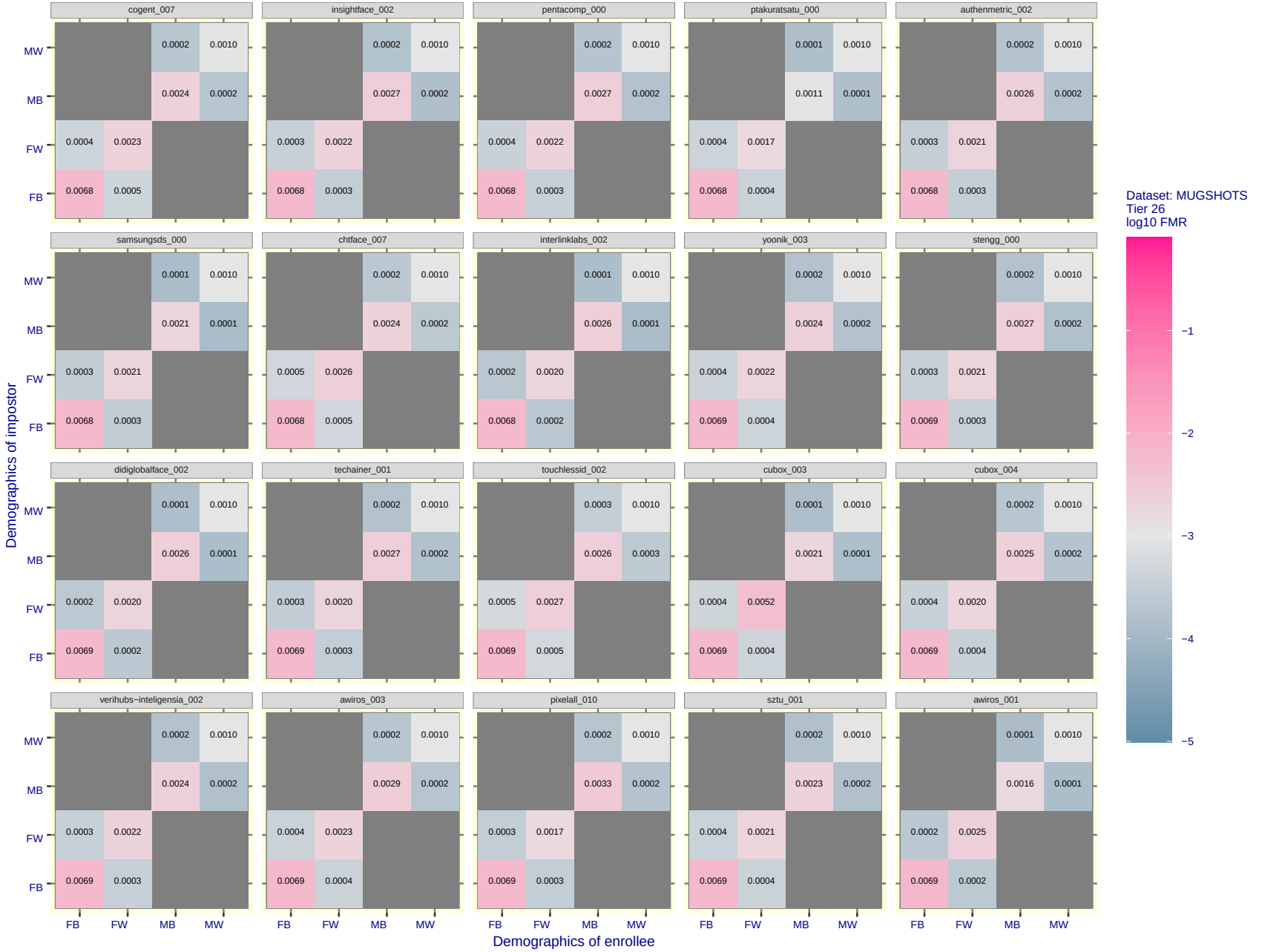

Figure 340: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

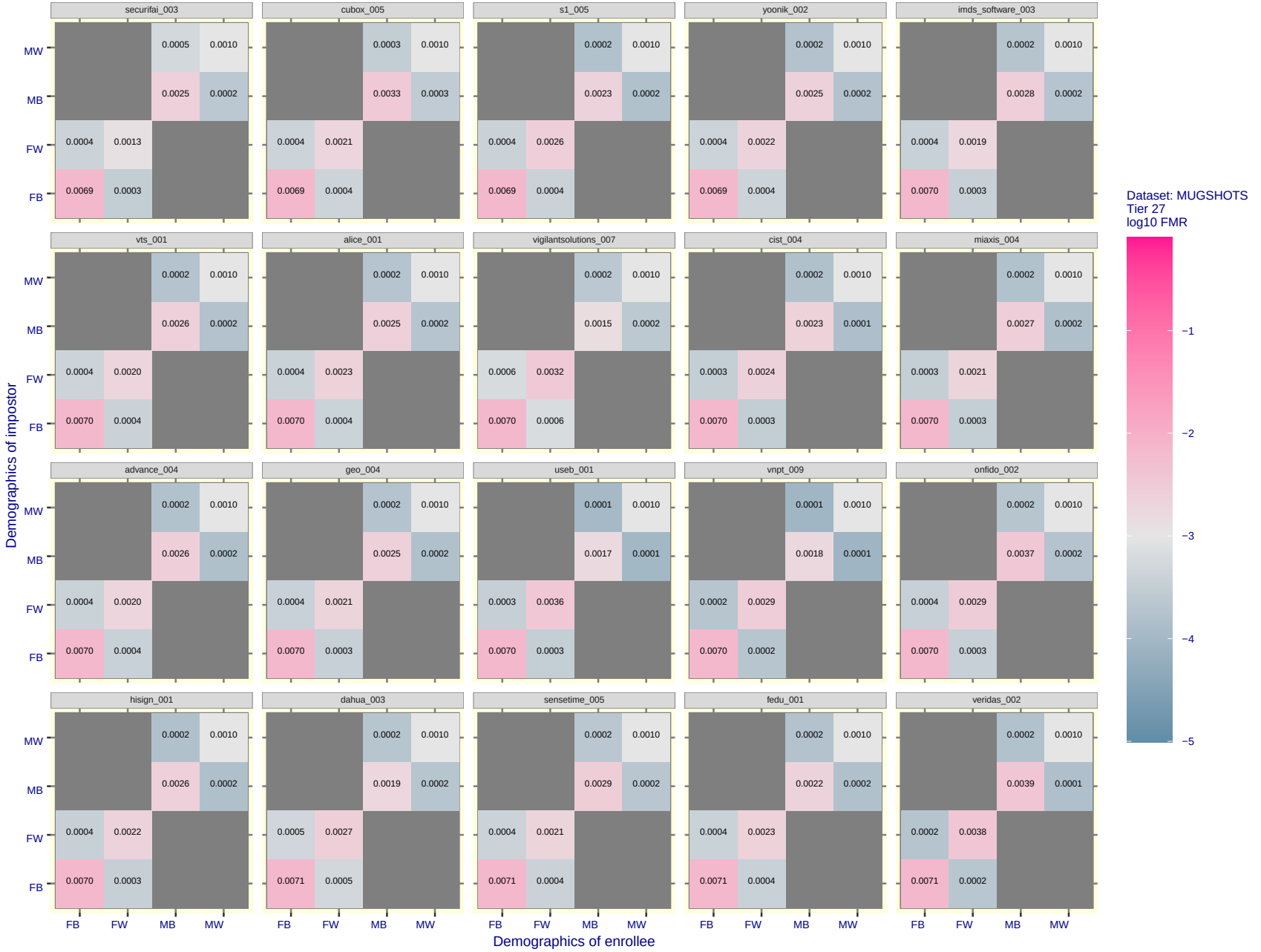

Figure 341: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

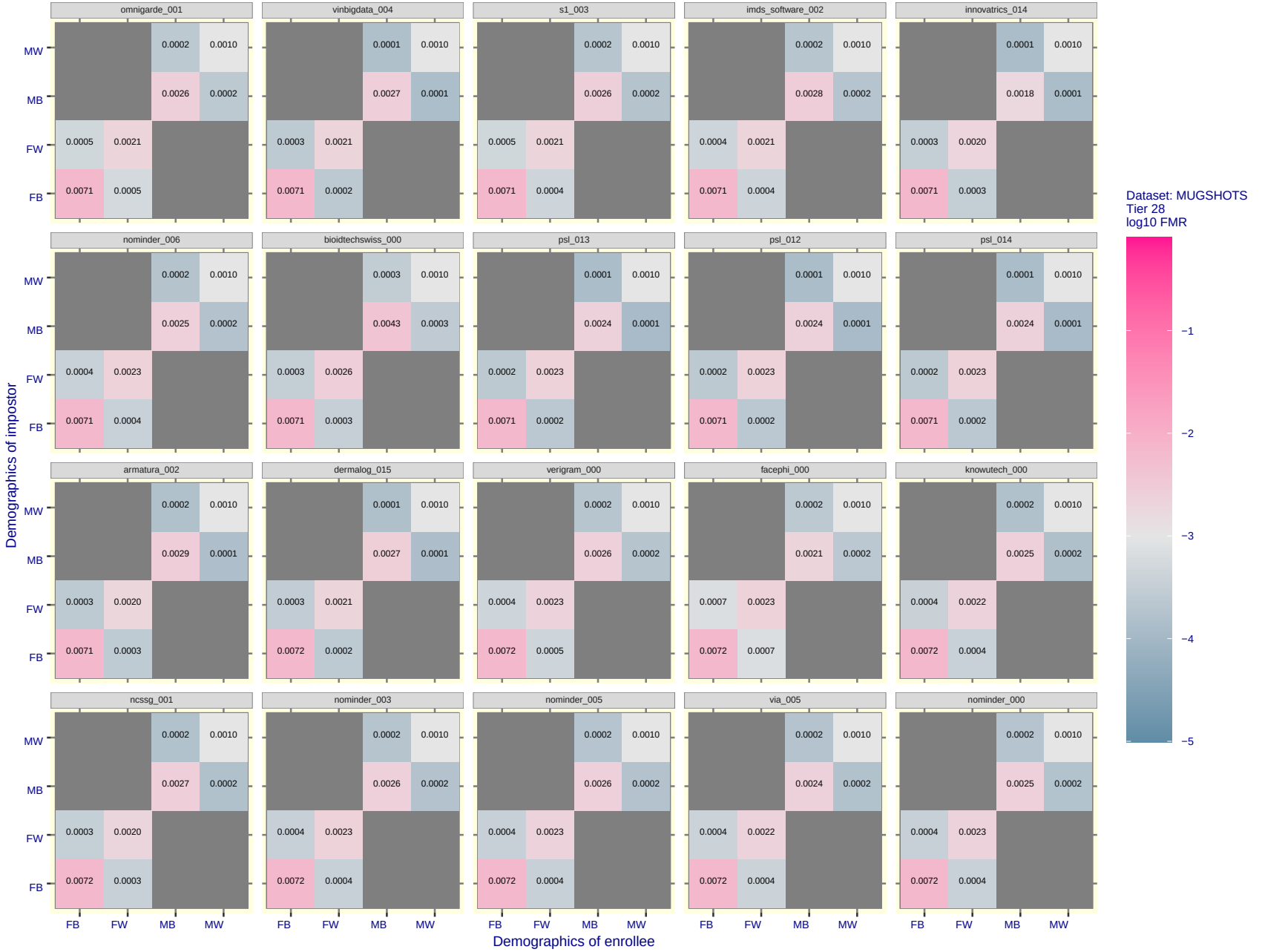

Figure 342: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

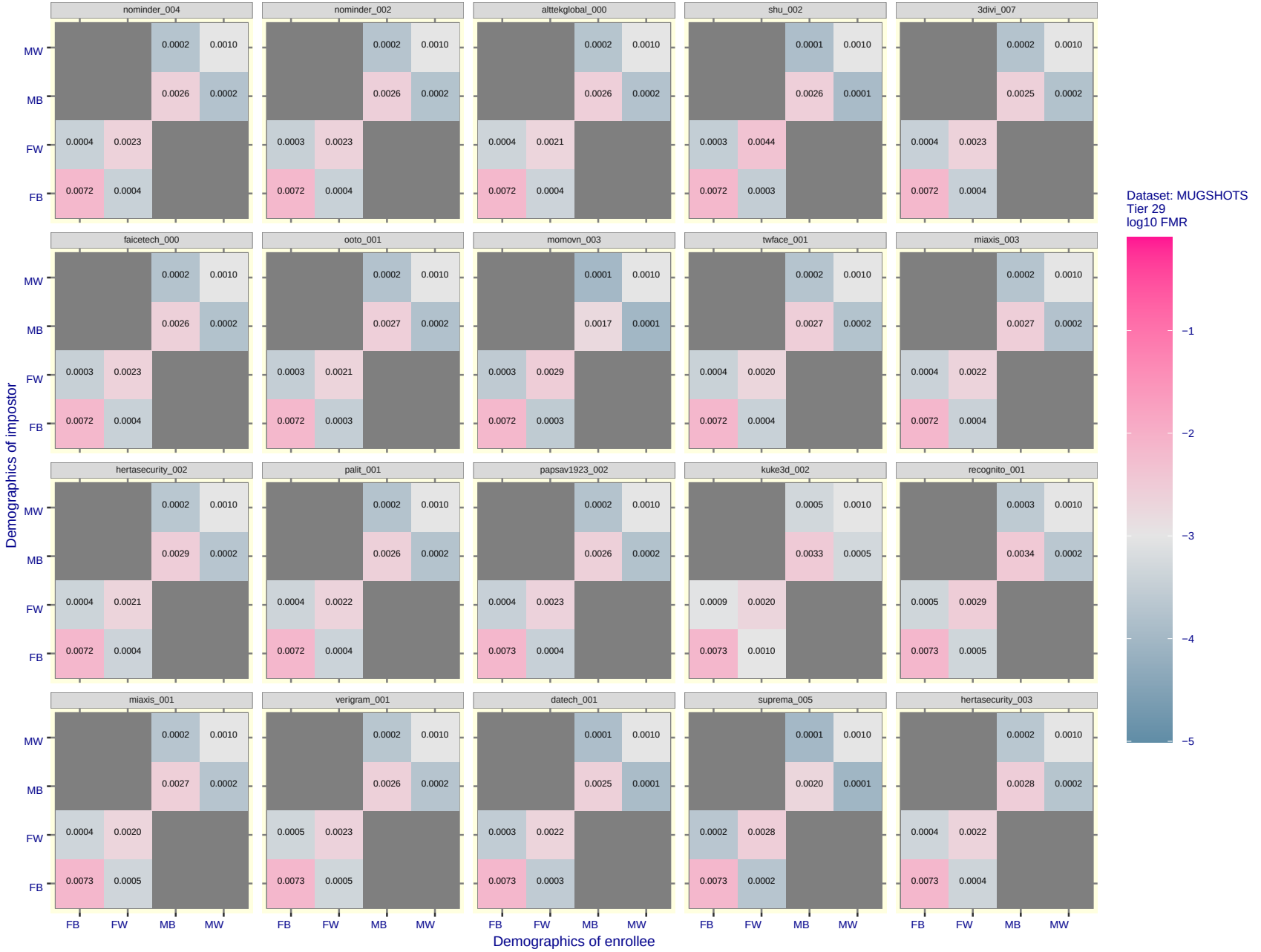

Figure 343: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

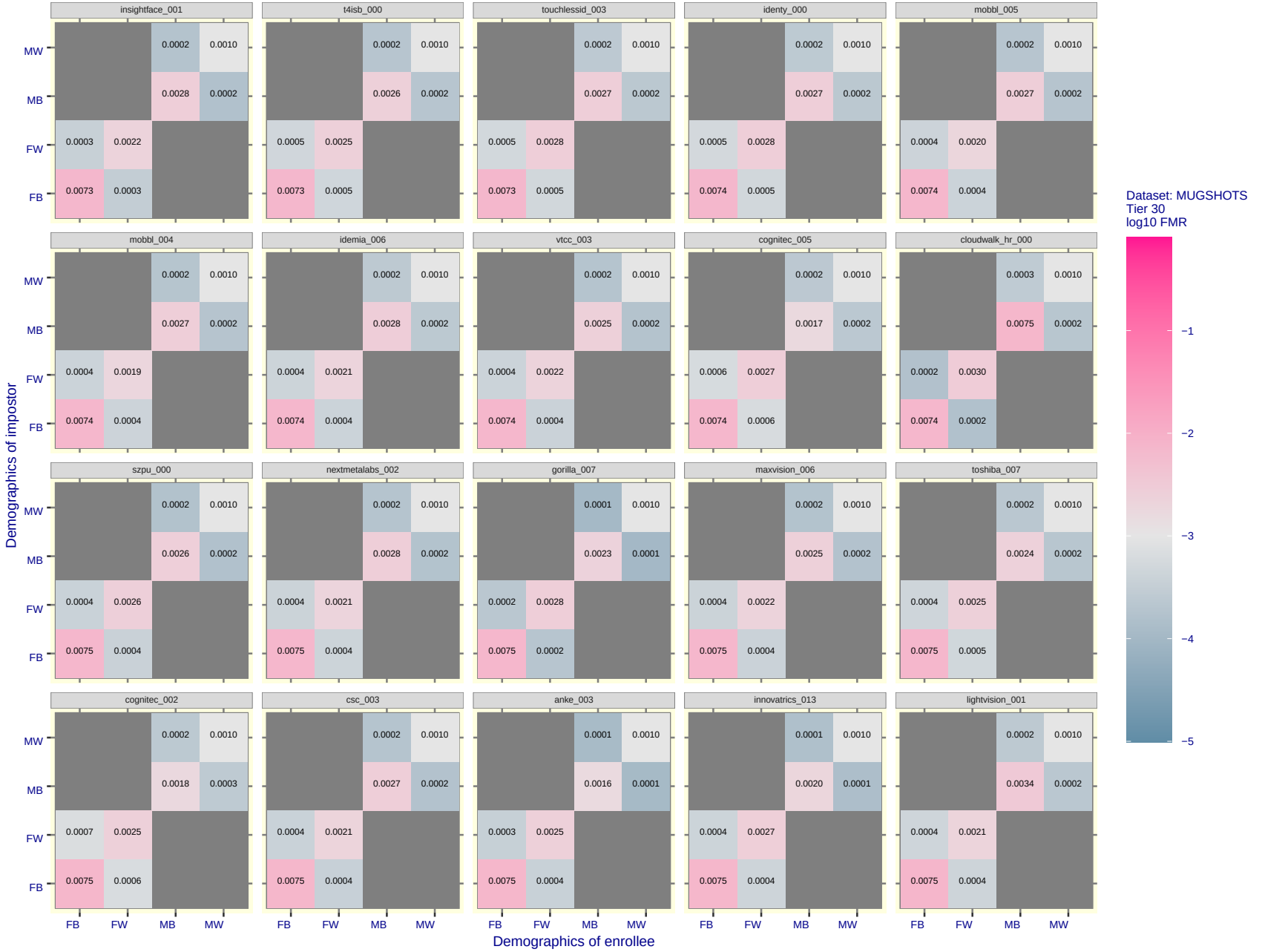

Figure 344: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

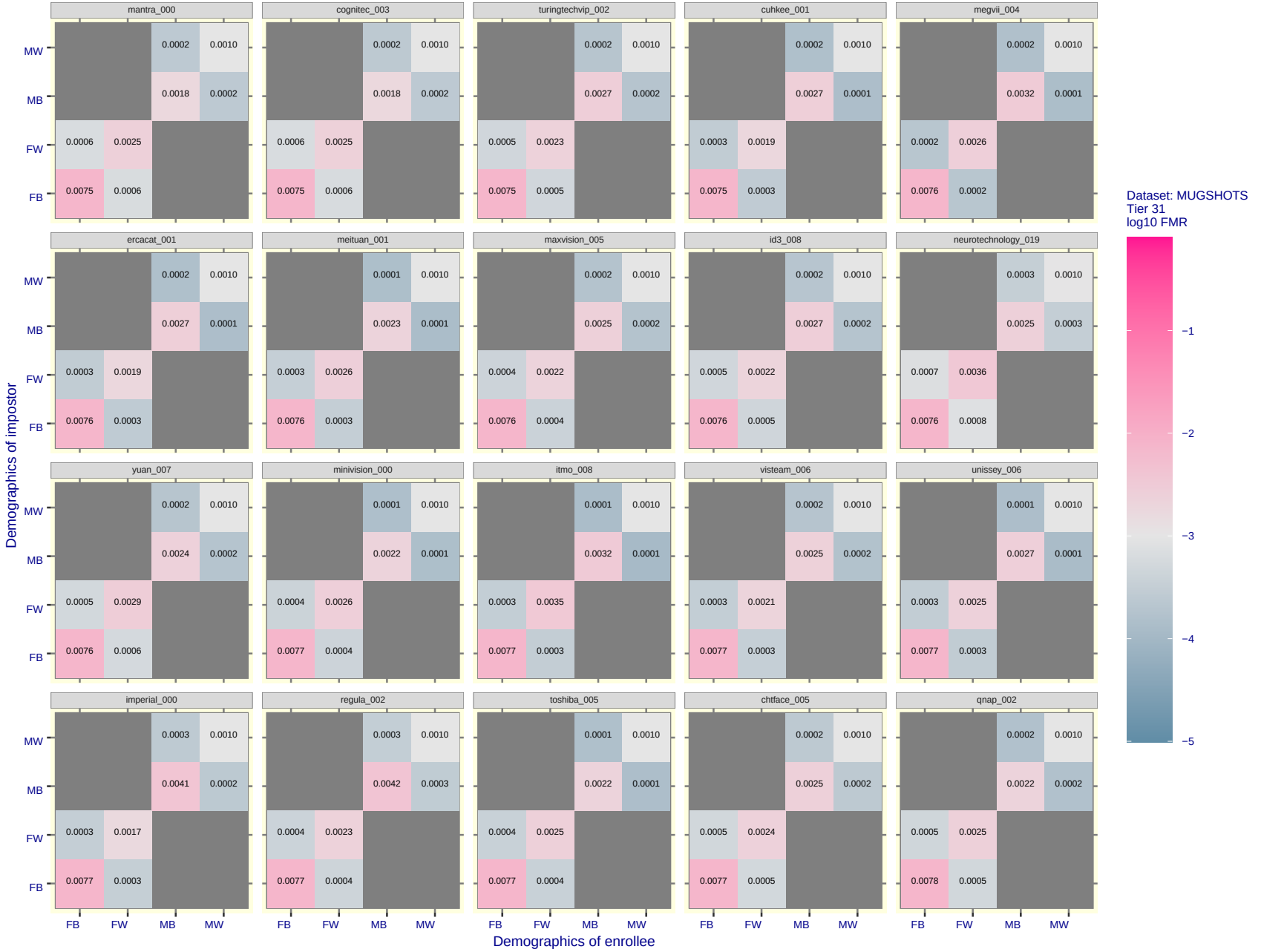

Figure 345: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

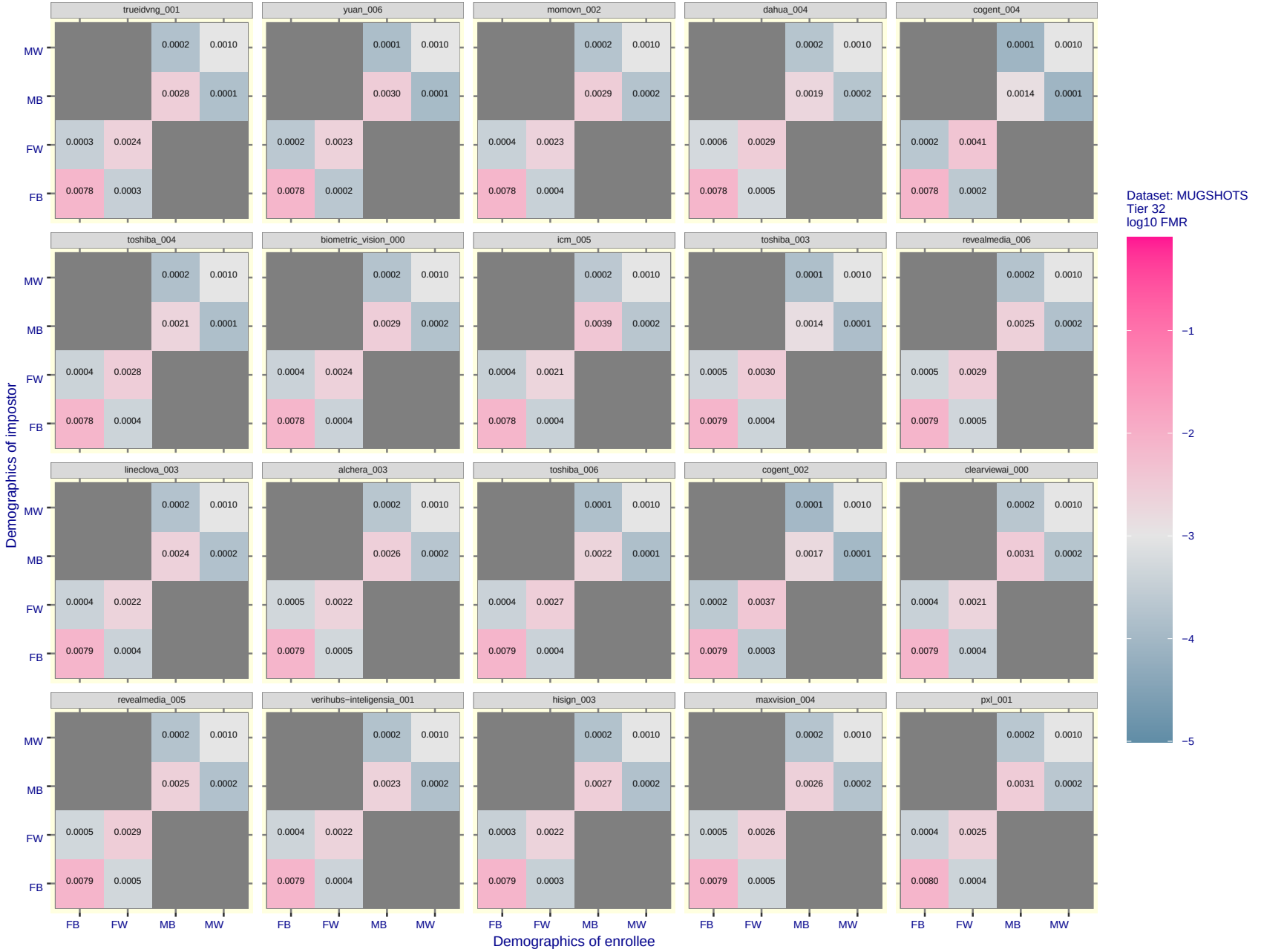

Figure 346: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

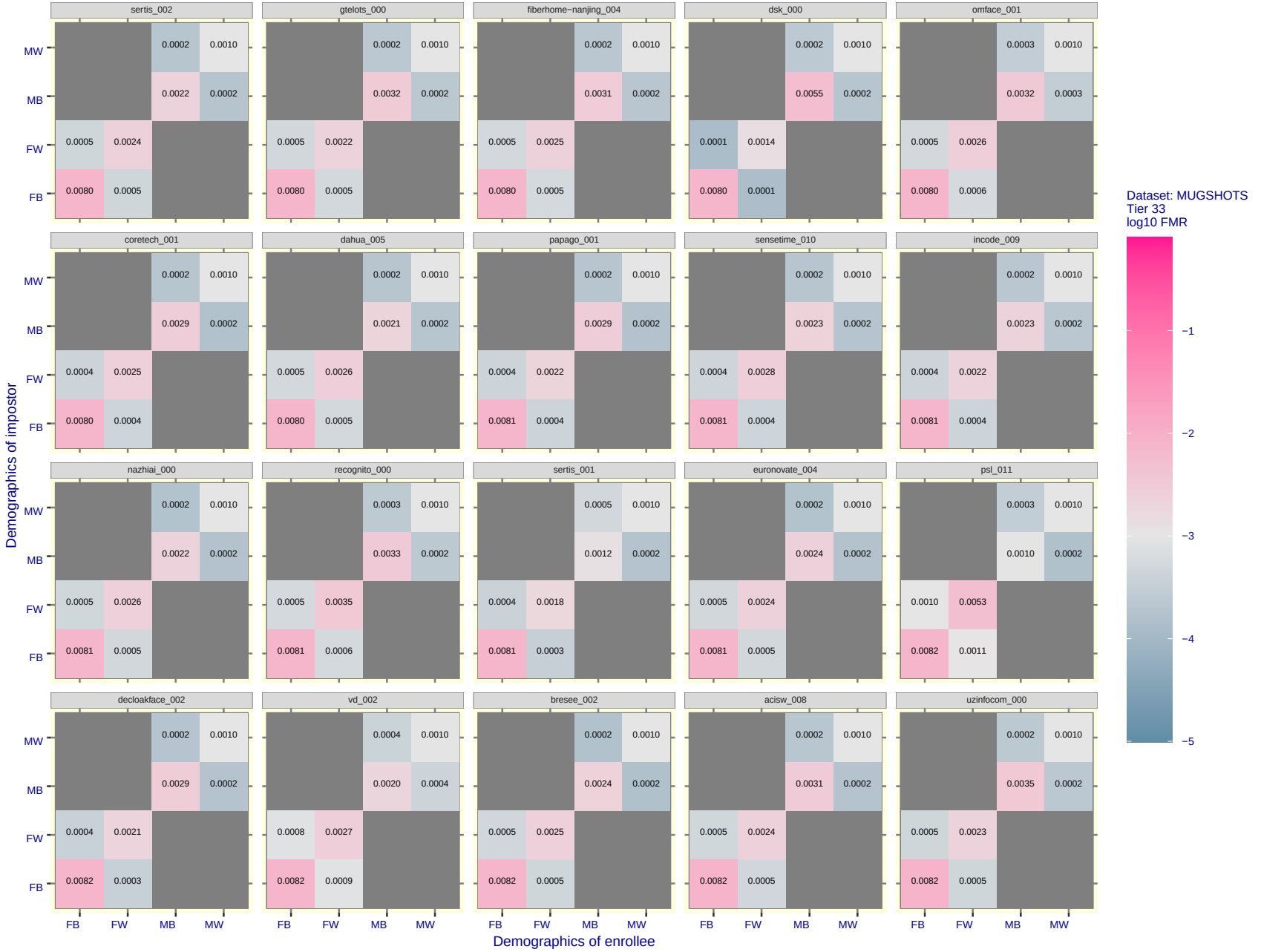

Figure 347: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

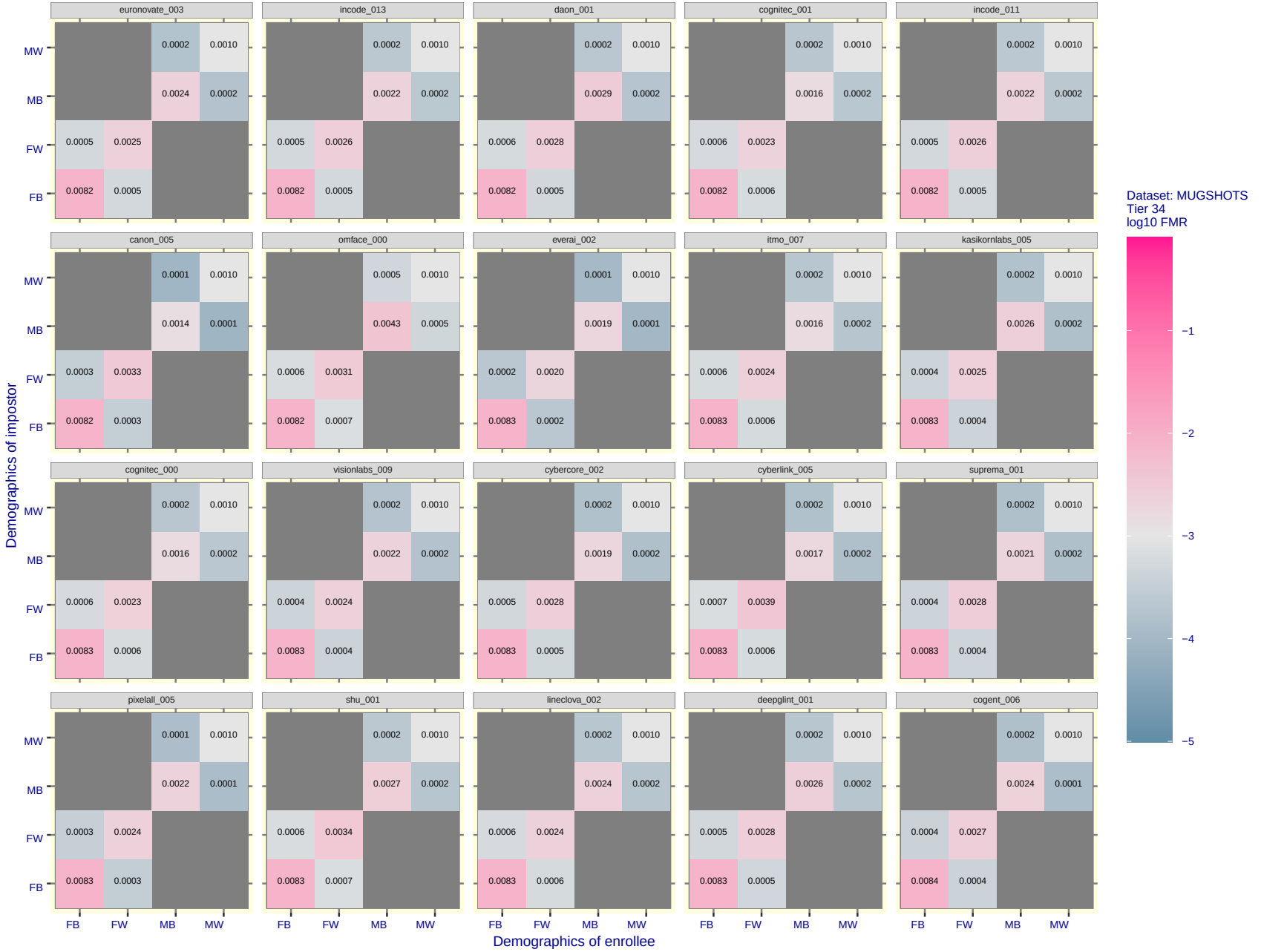

Figure 348: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

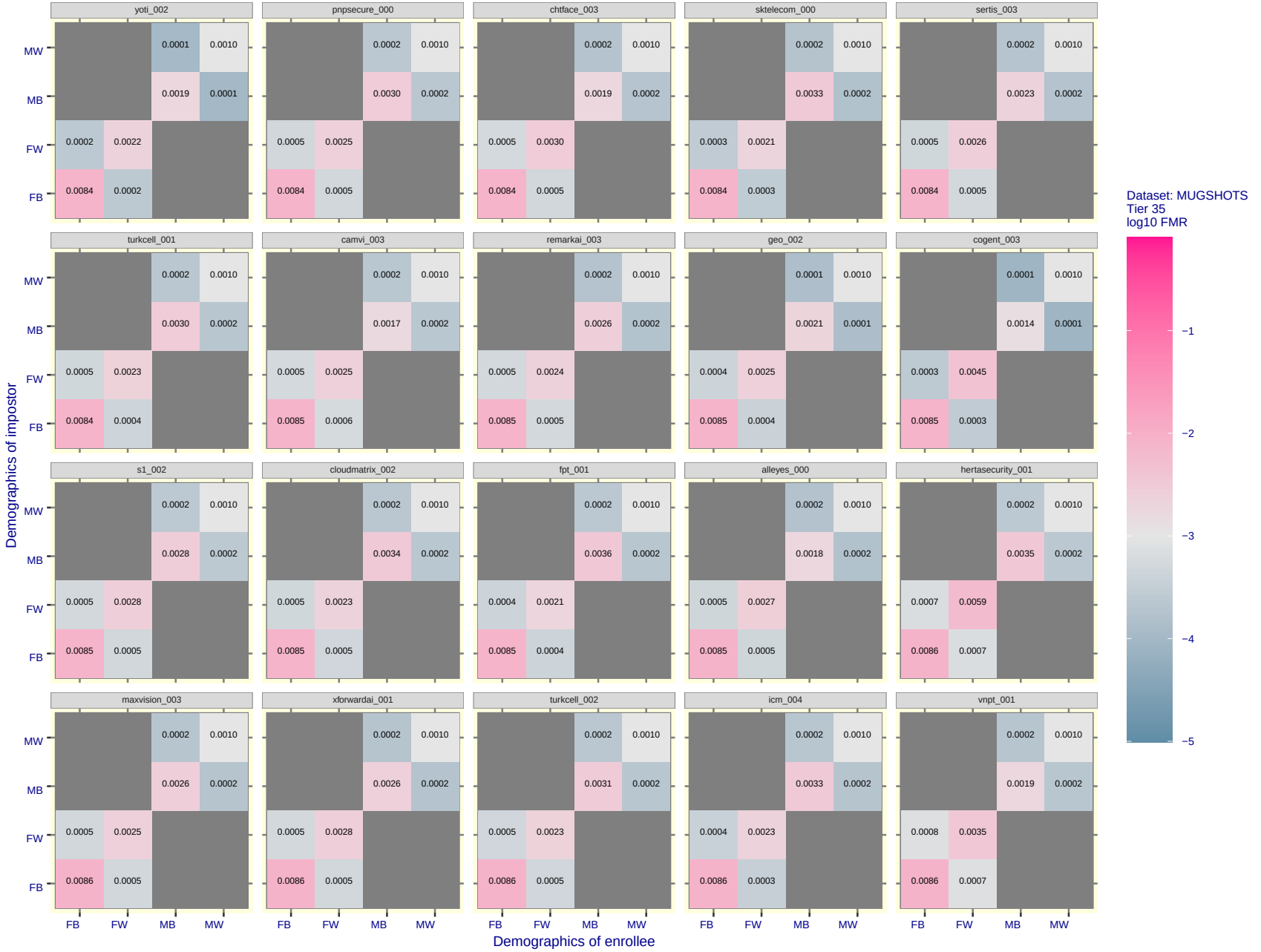

Figure 349: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

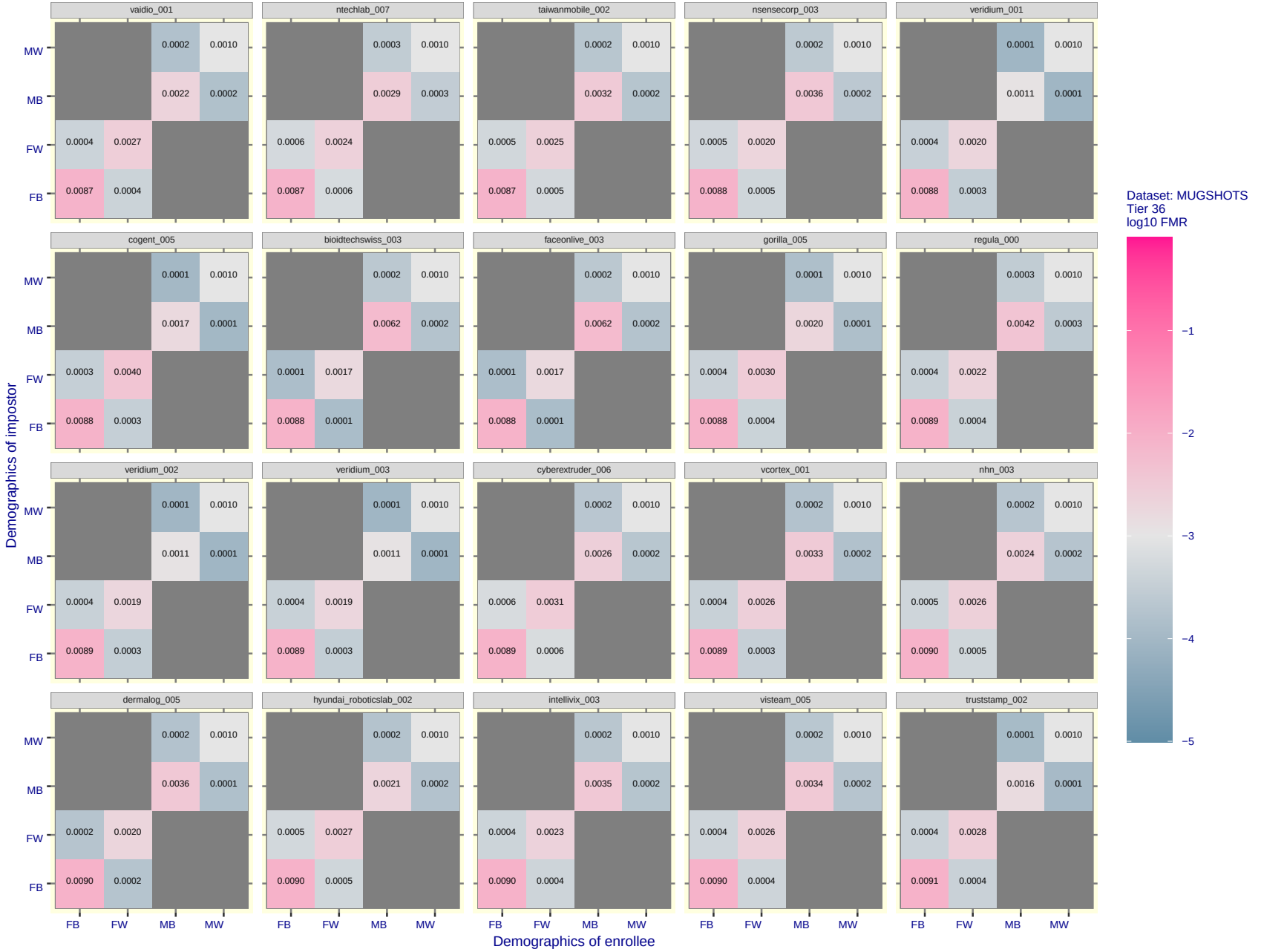

Figure 350: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

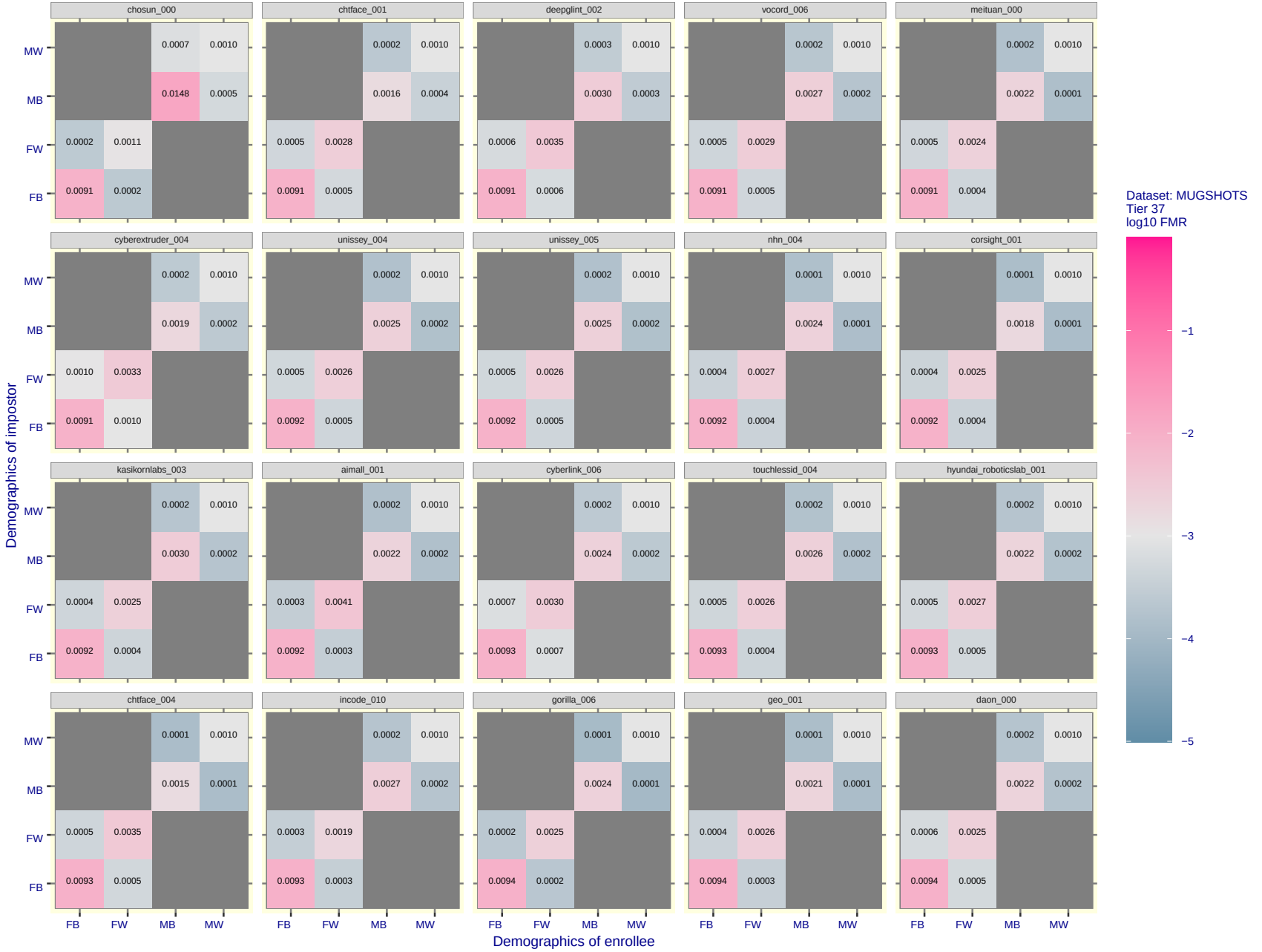

Figure 351: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

FNMR(T) "False non-match rate"
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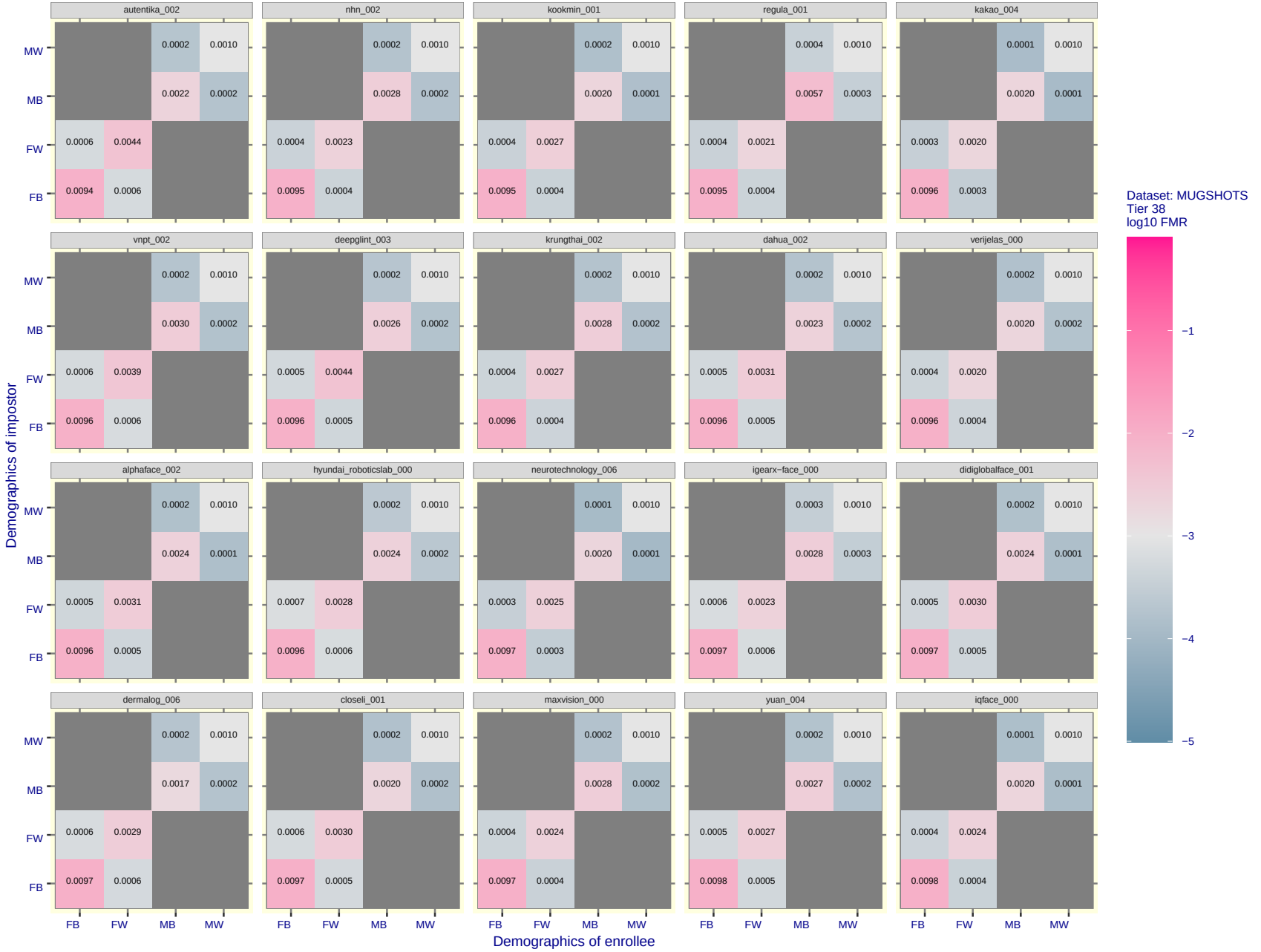

Figure 352: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

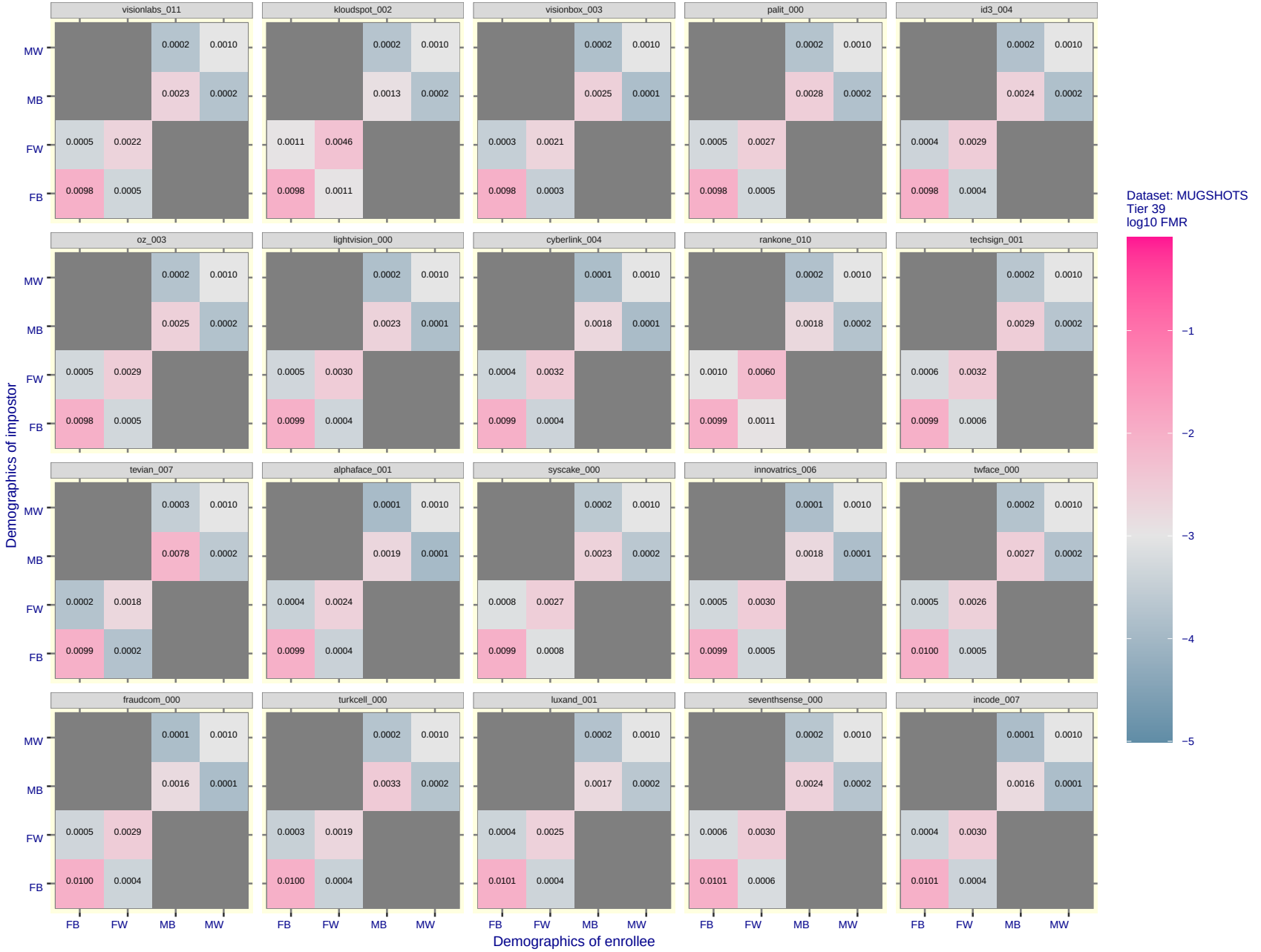

Figure 353: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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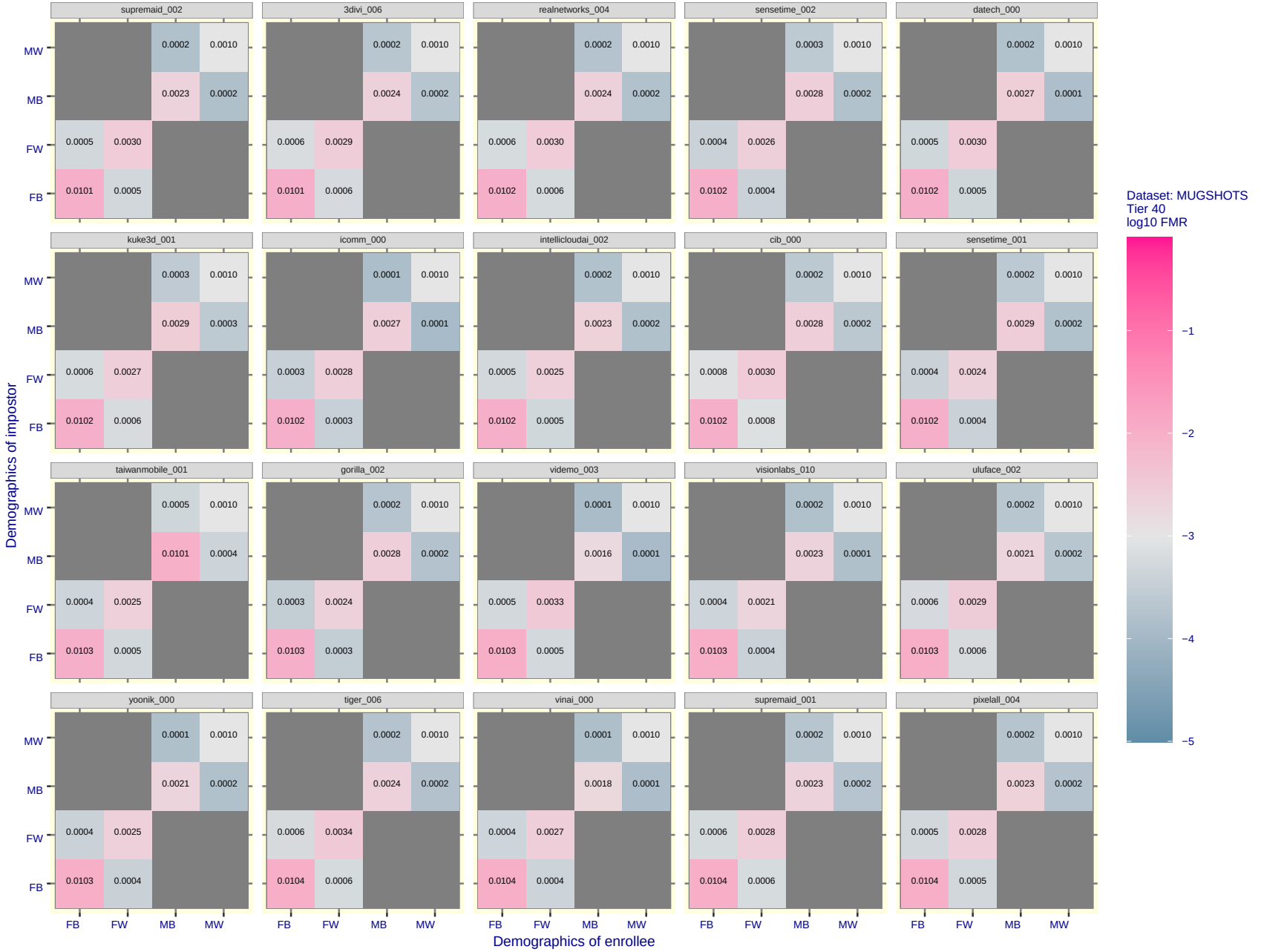

Figure 354: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

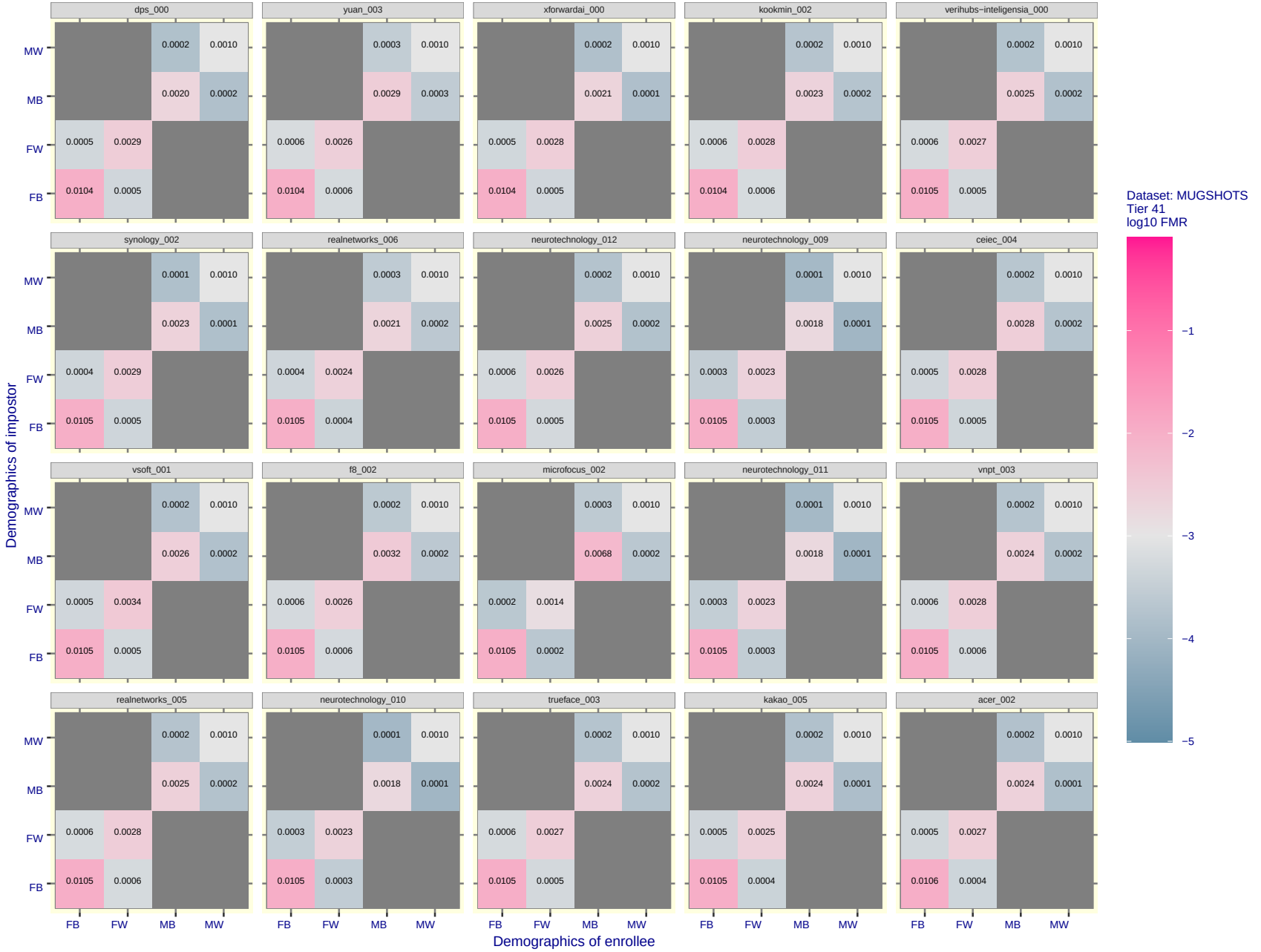

Figure 355: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

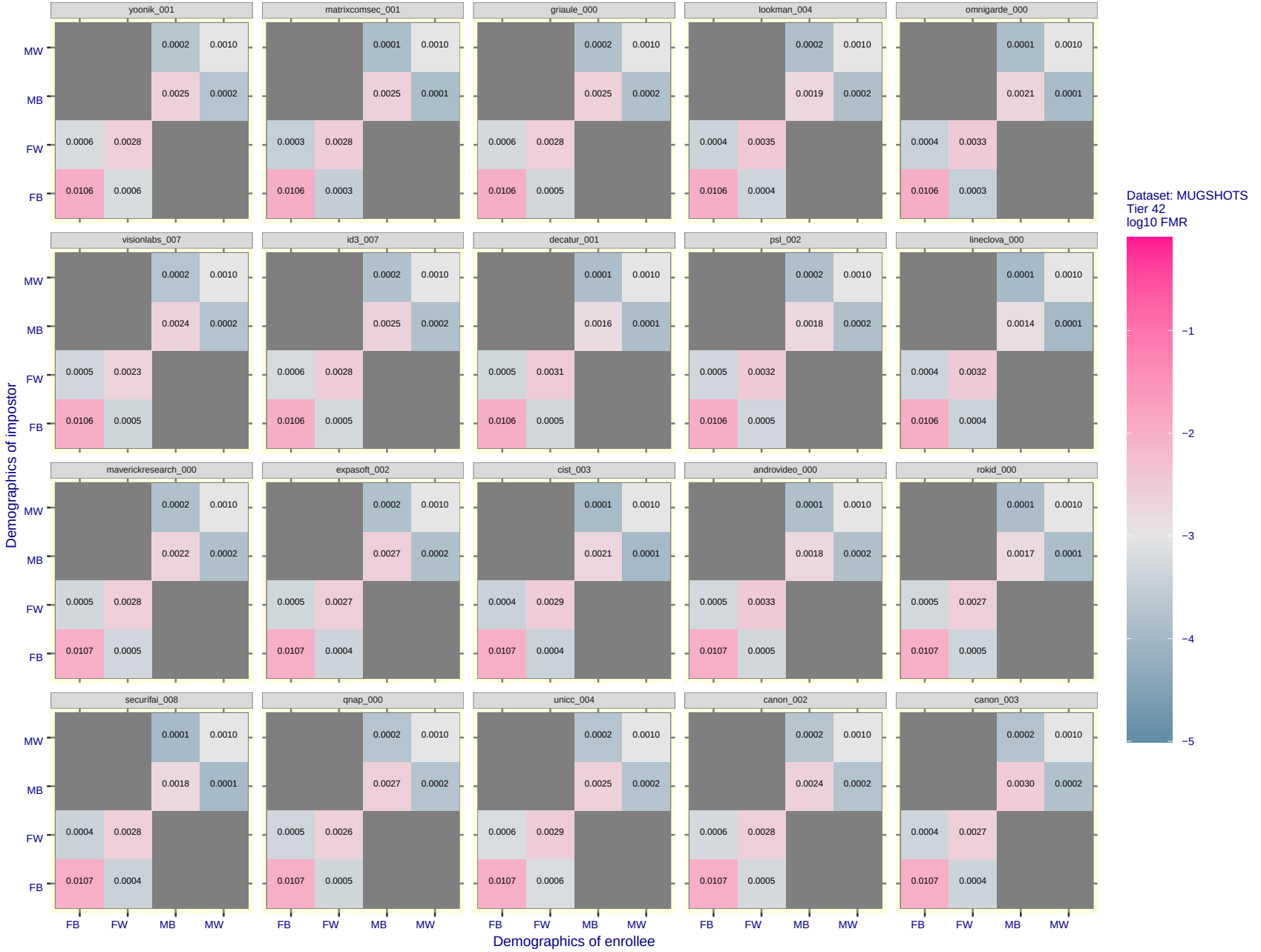

Figure 356: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

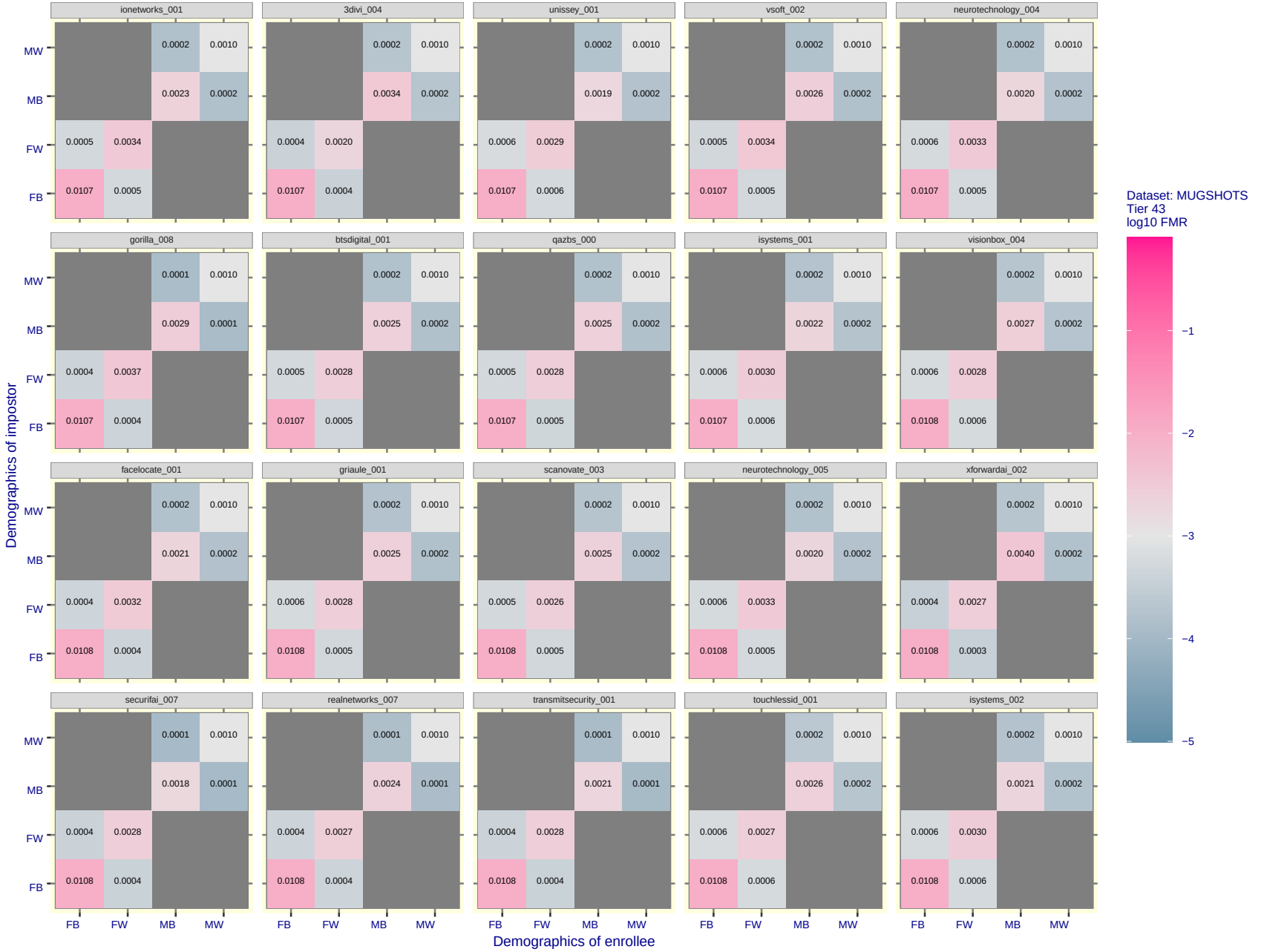

Figure 357: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

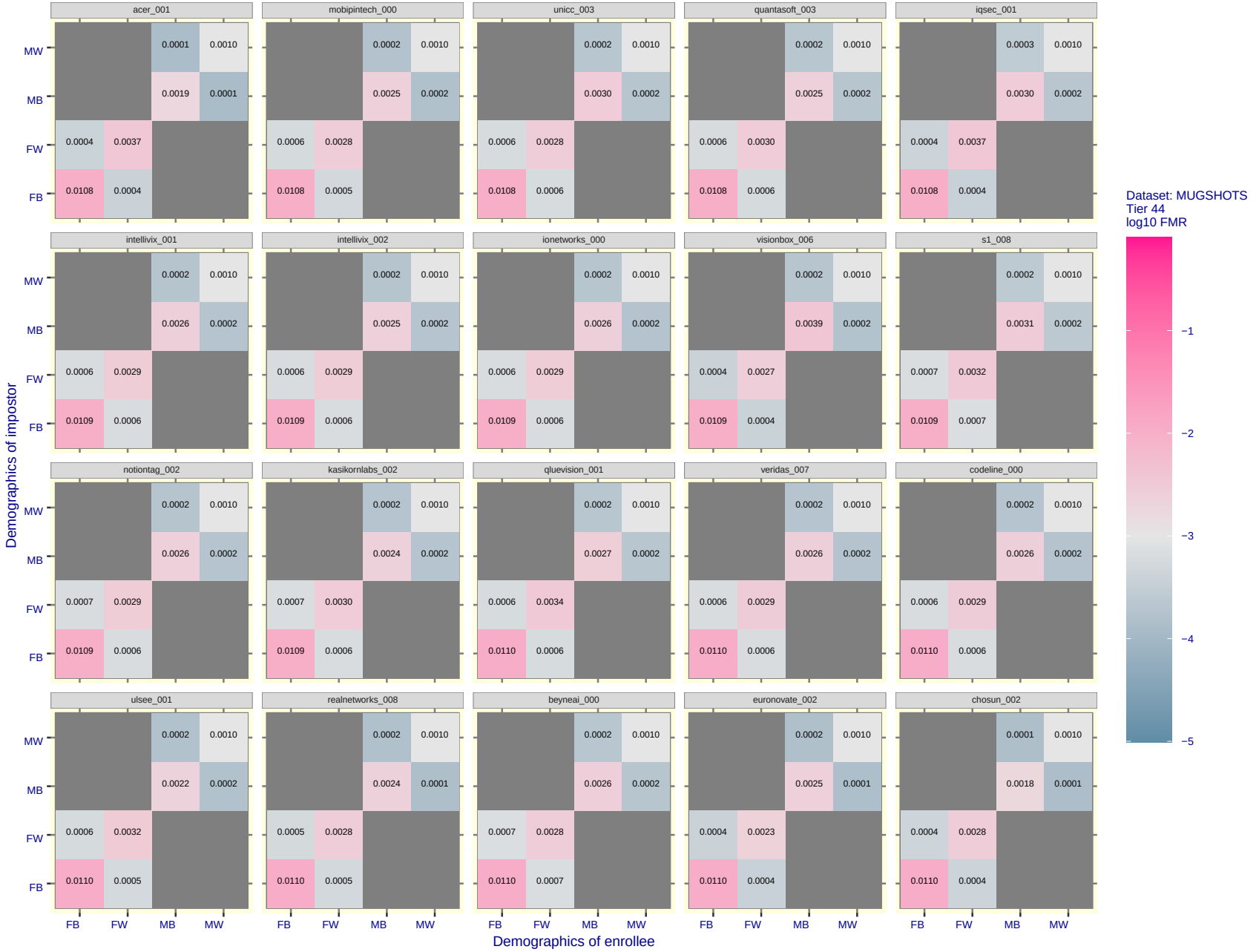

Figure 358: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

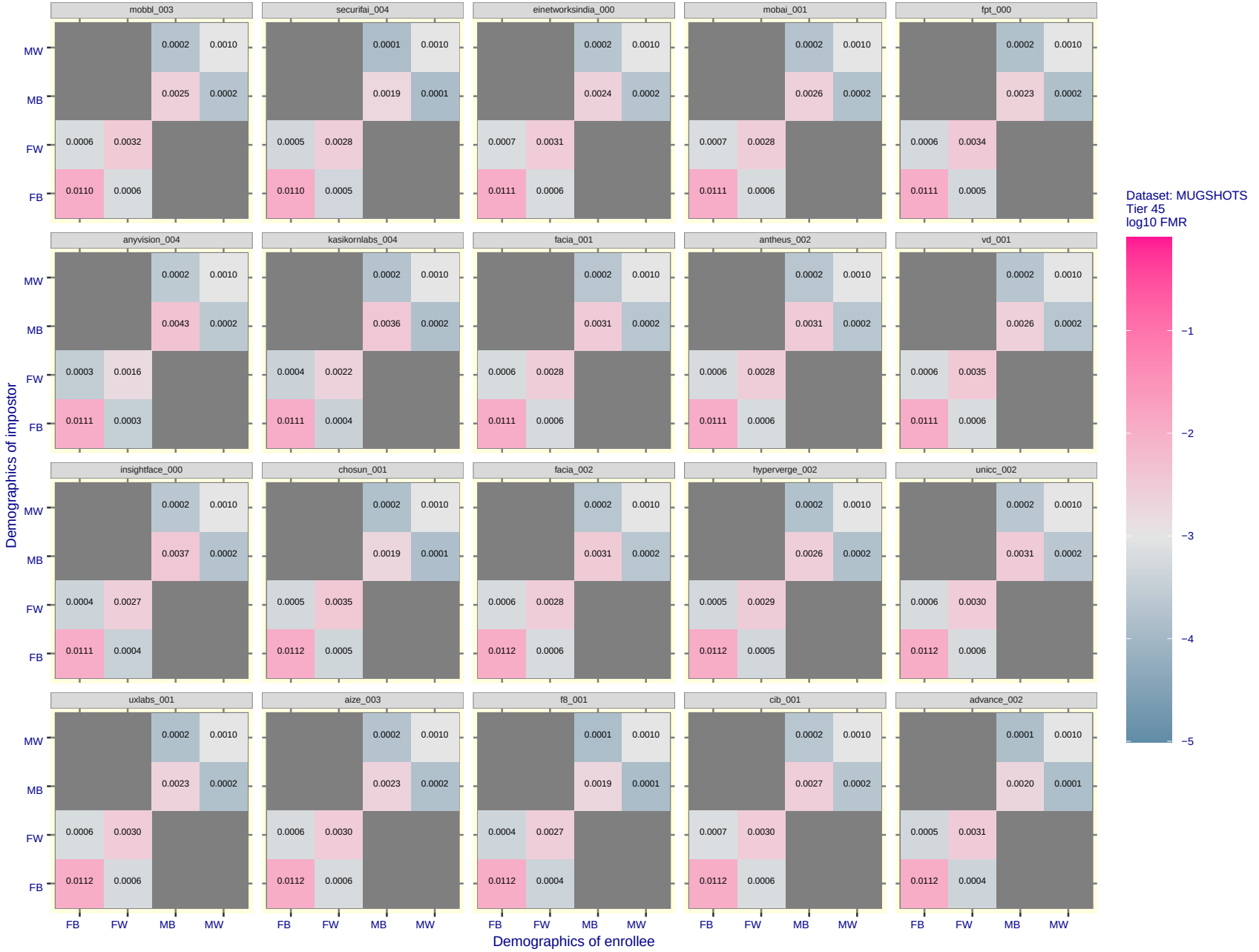

Figure 359: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

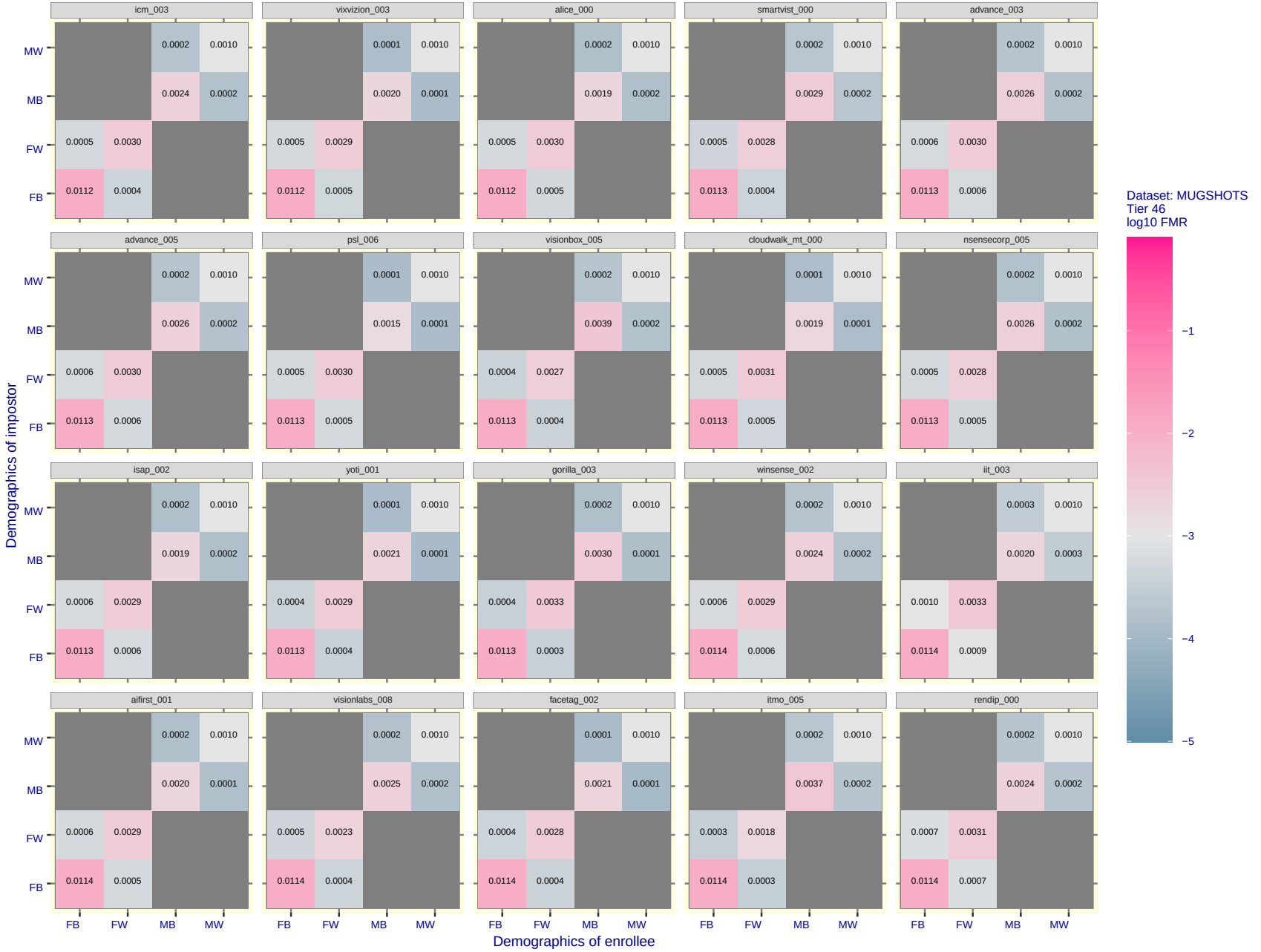

Figure 360: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

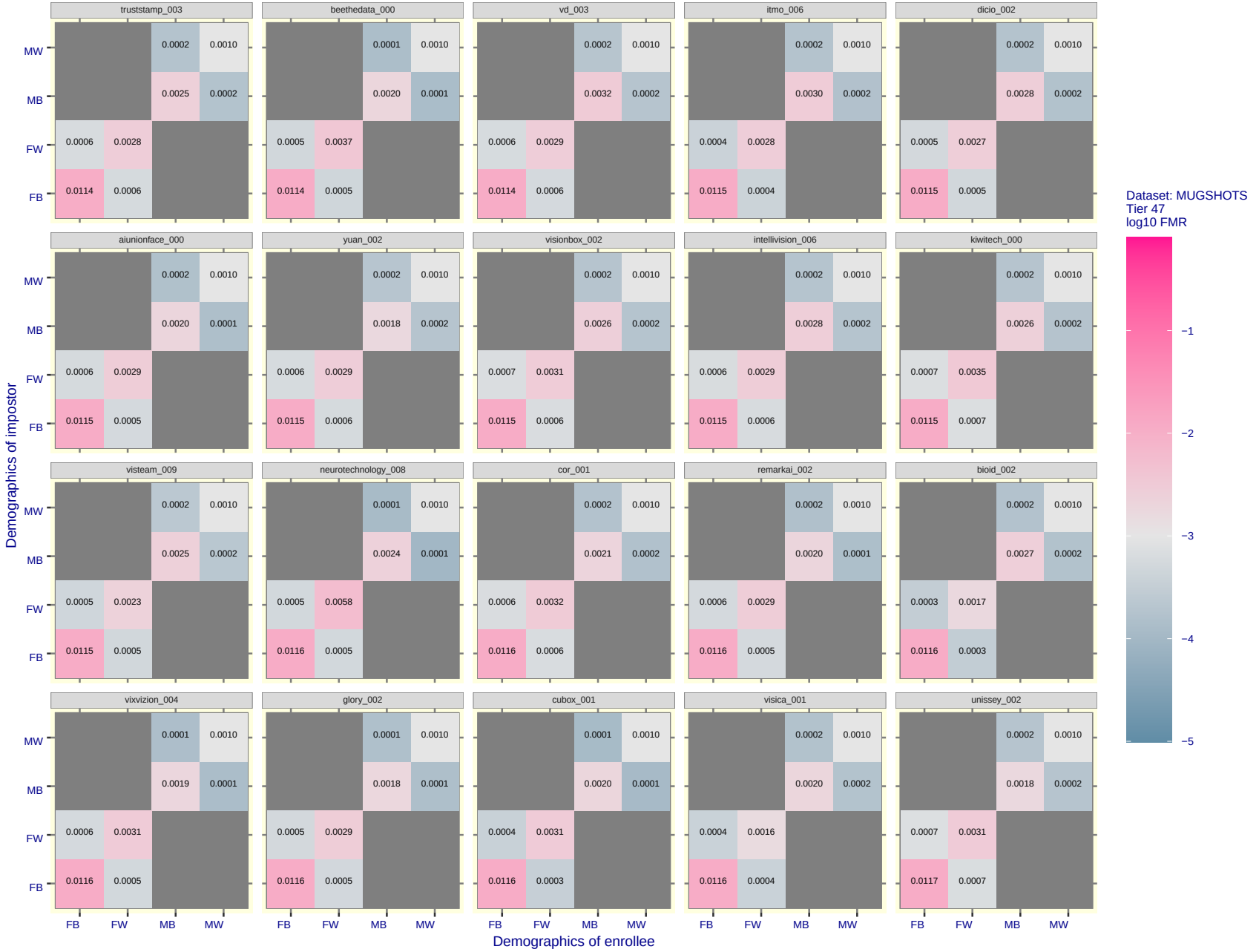

Figure 361: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

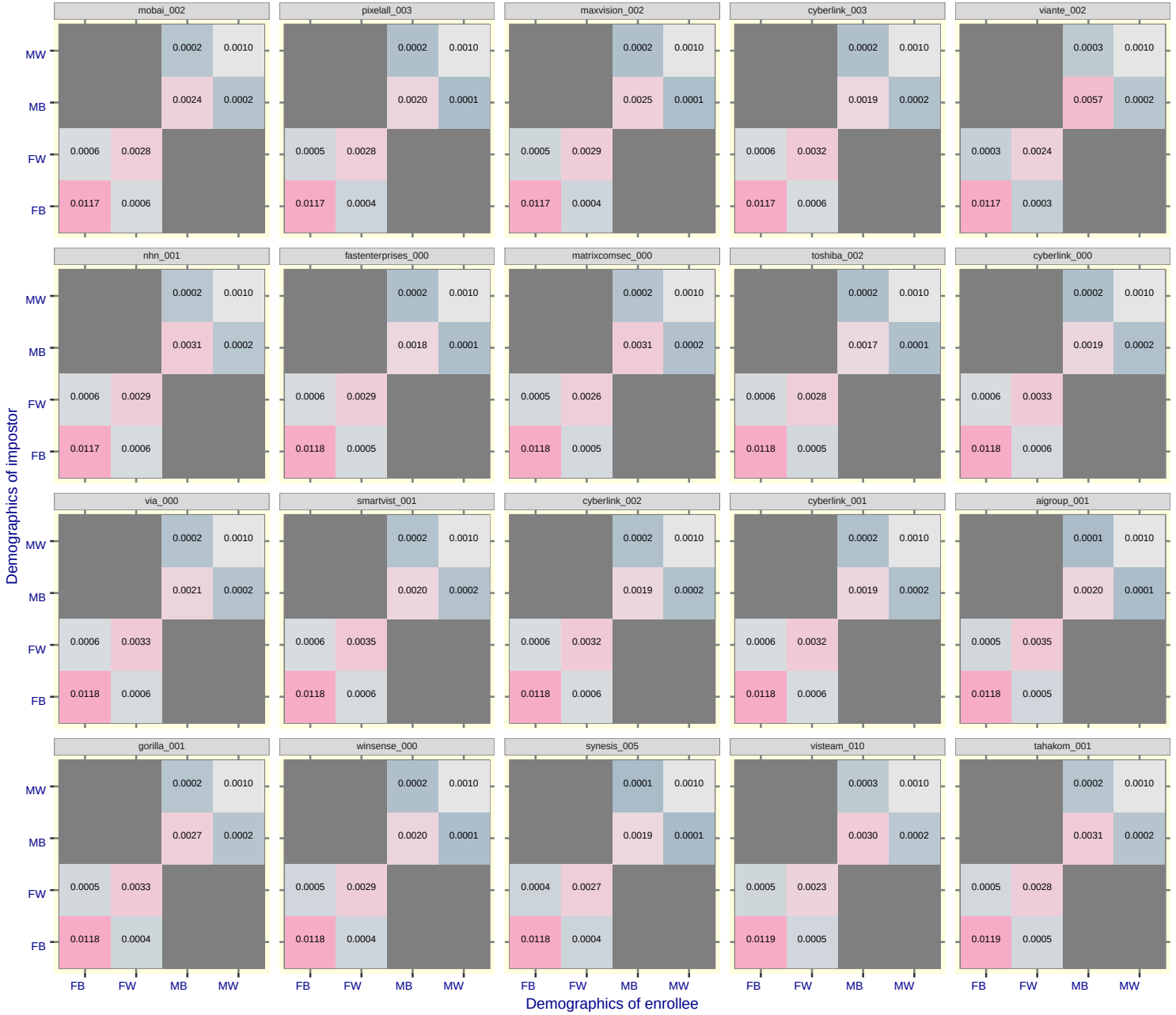

Figure 362: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

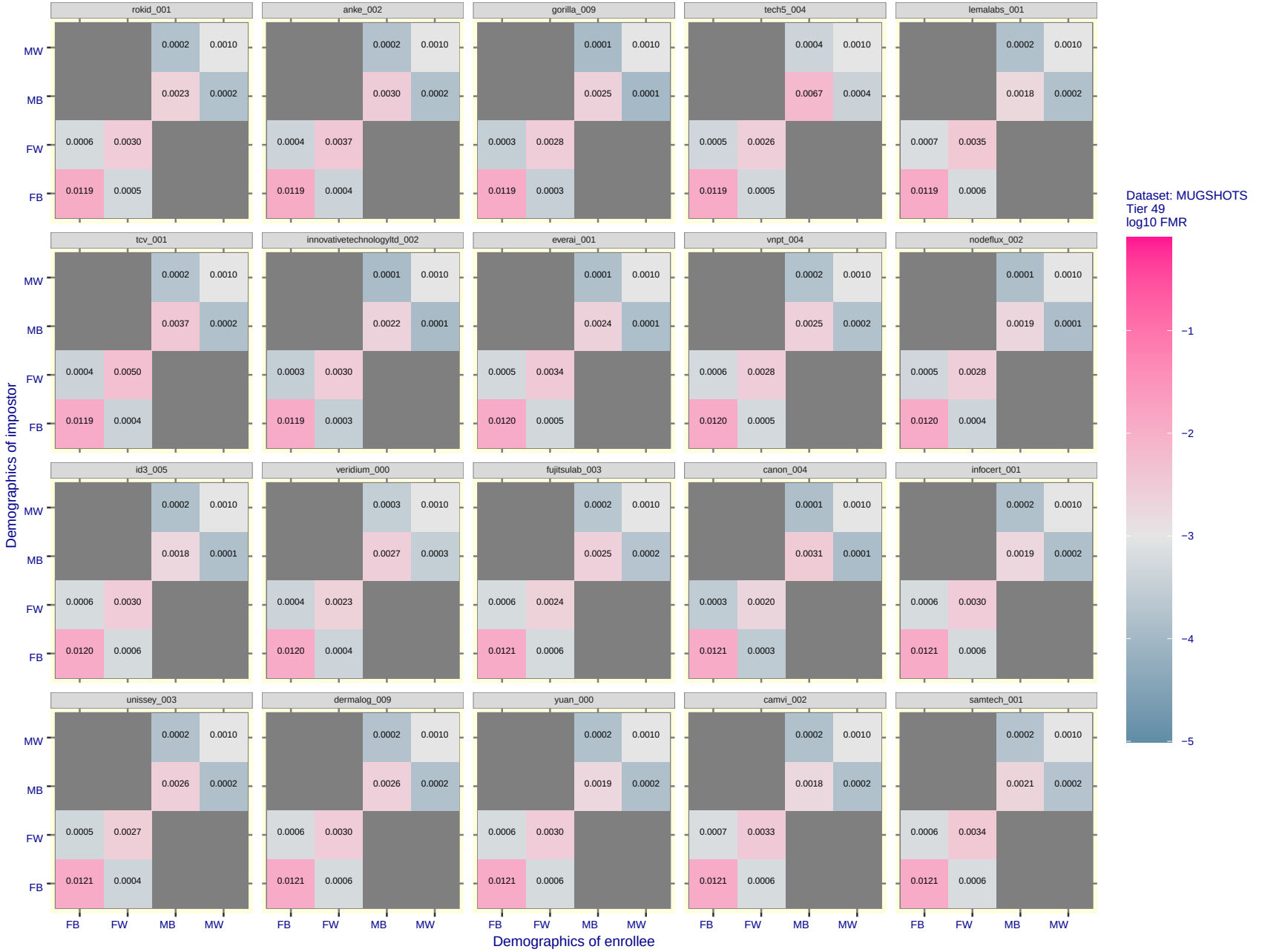

Figure 363: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

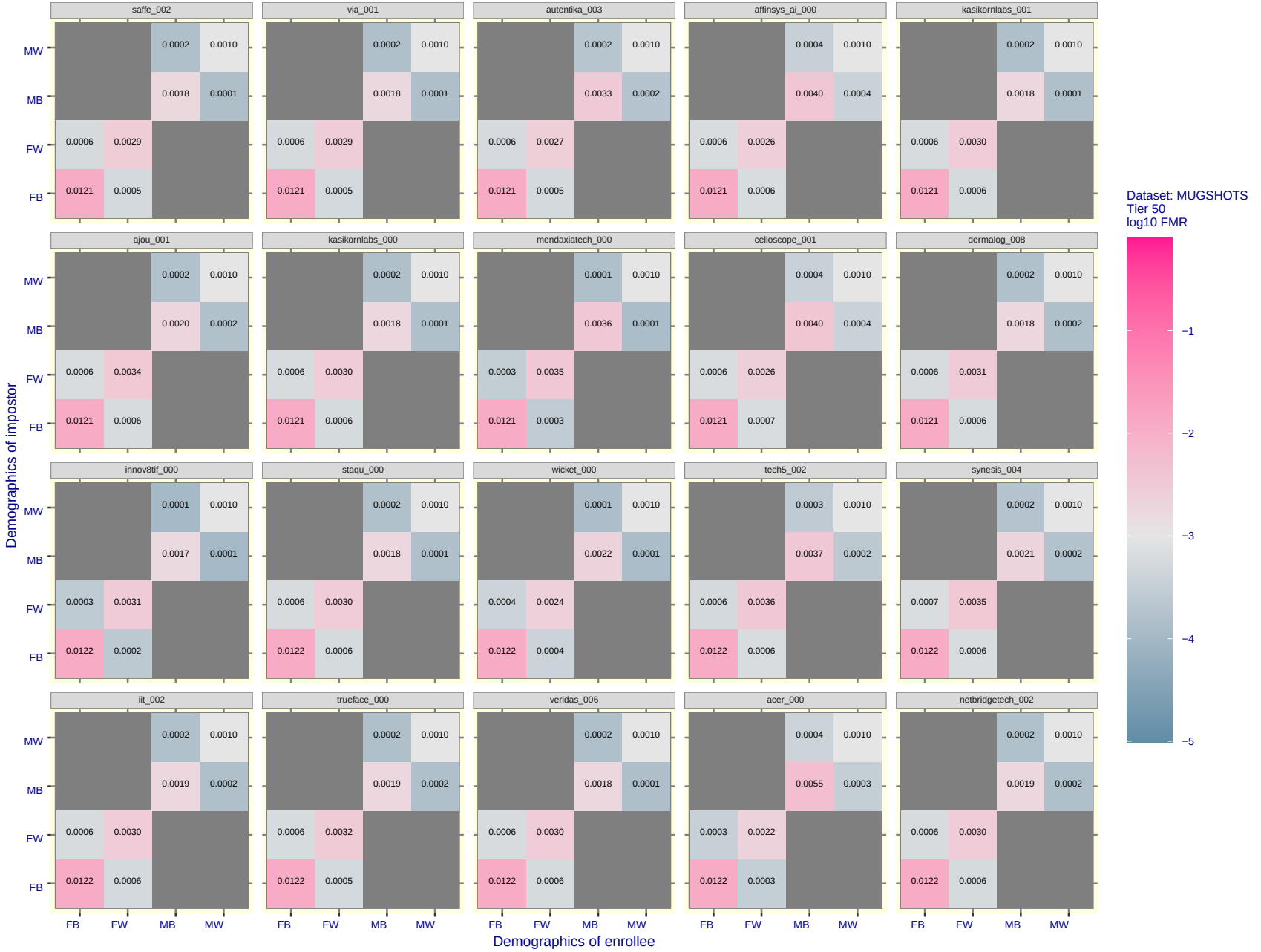

Figure 364: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

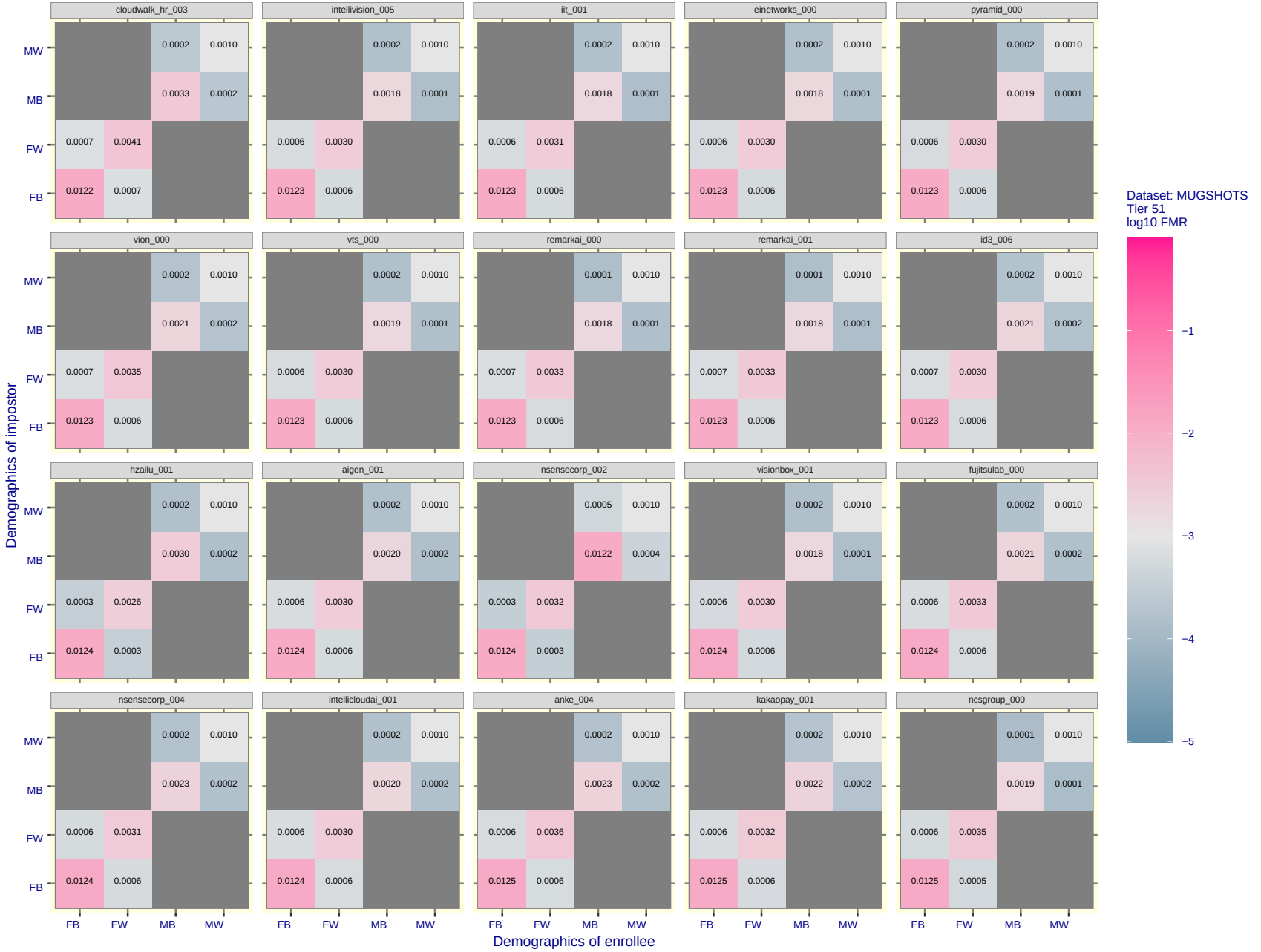

Figure 365: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

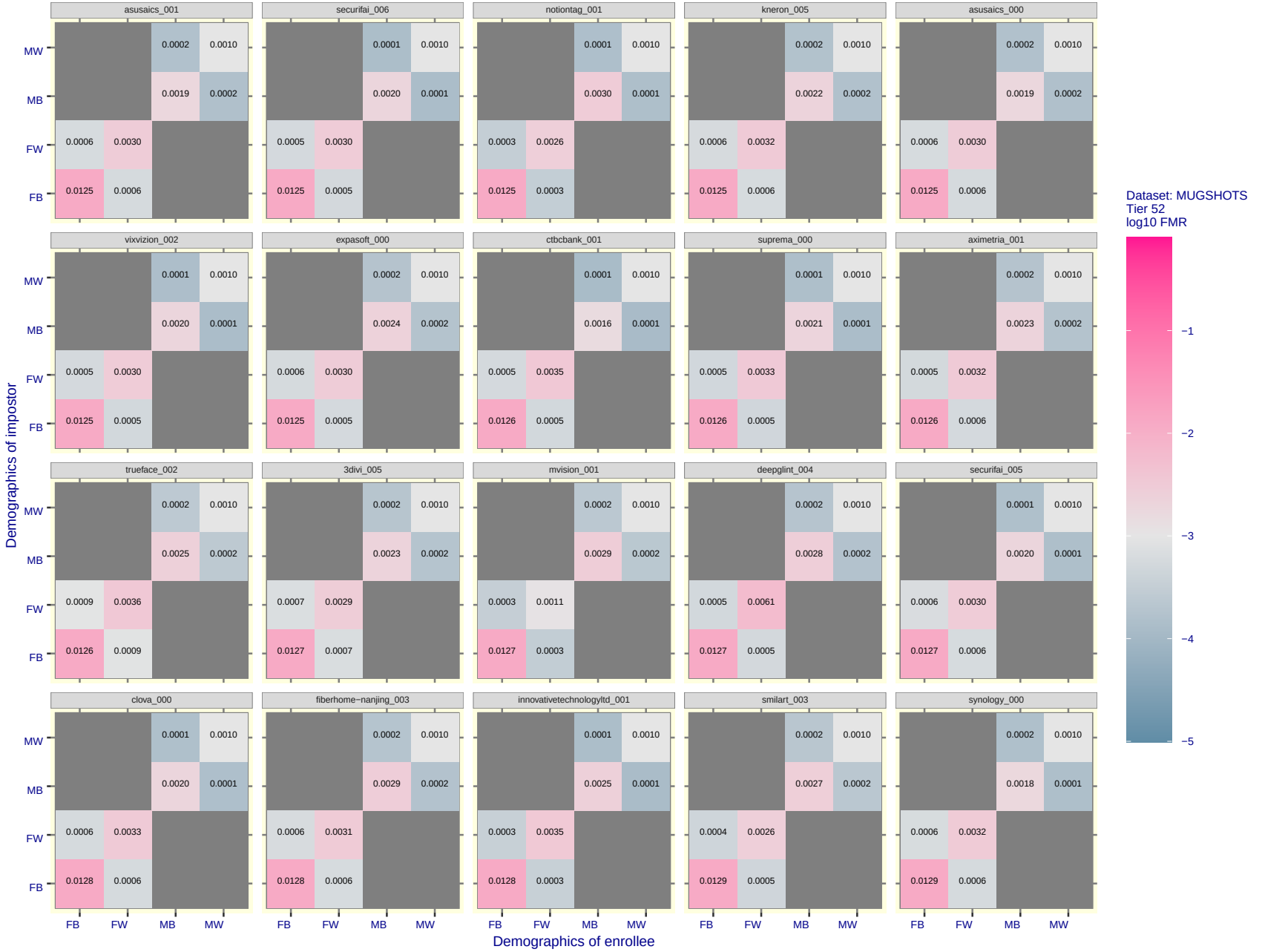

Figure 366: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

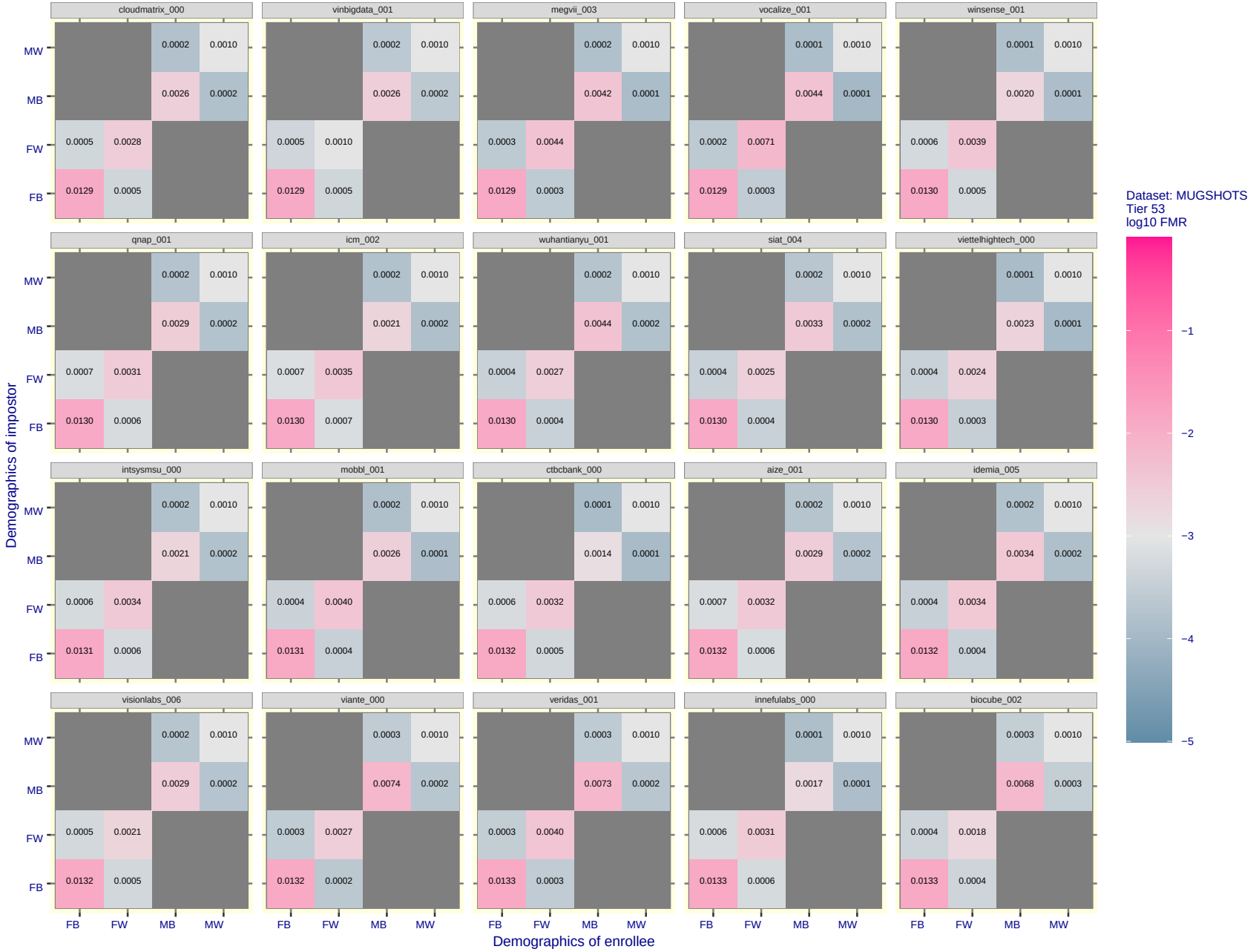

Figure 367: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

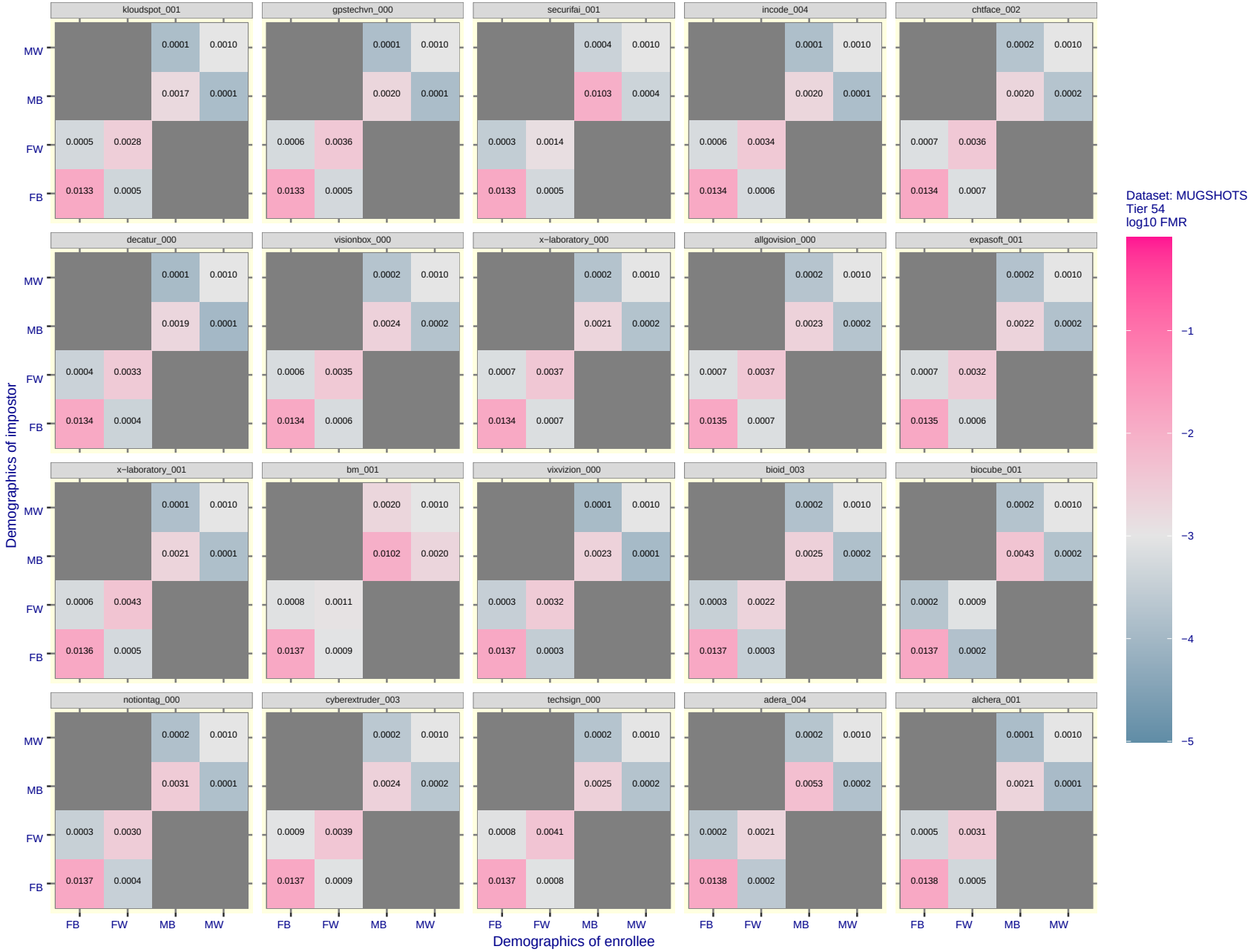

Figure 368: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

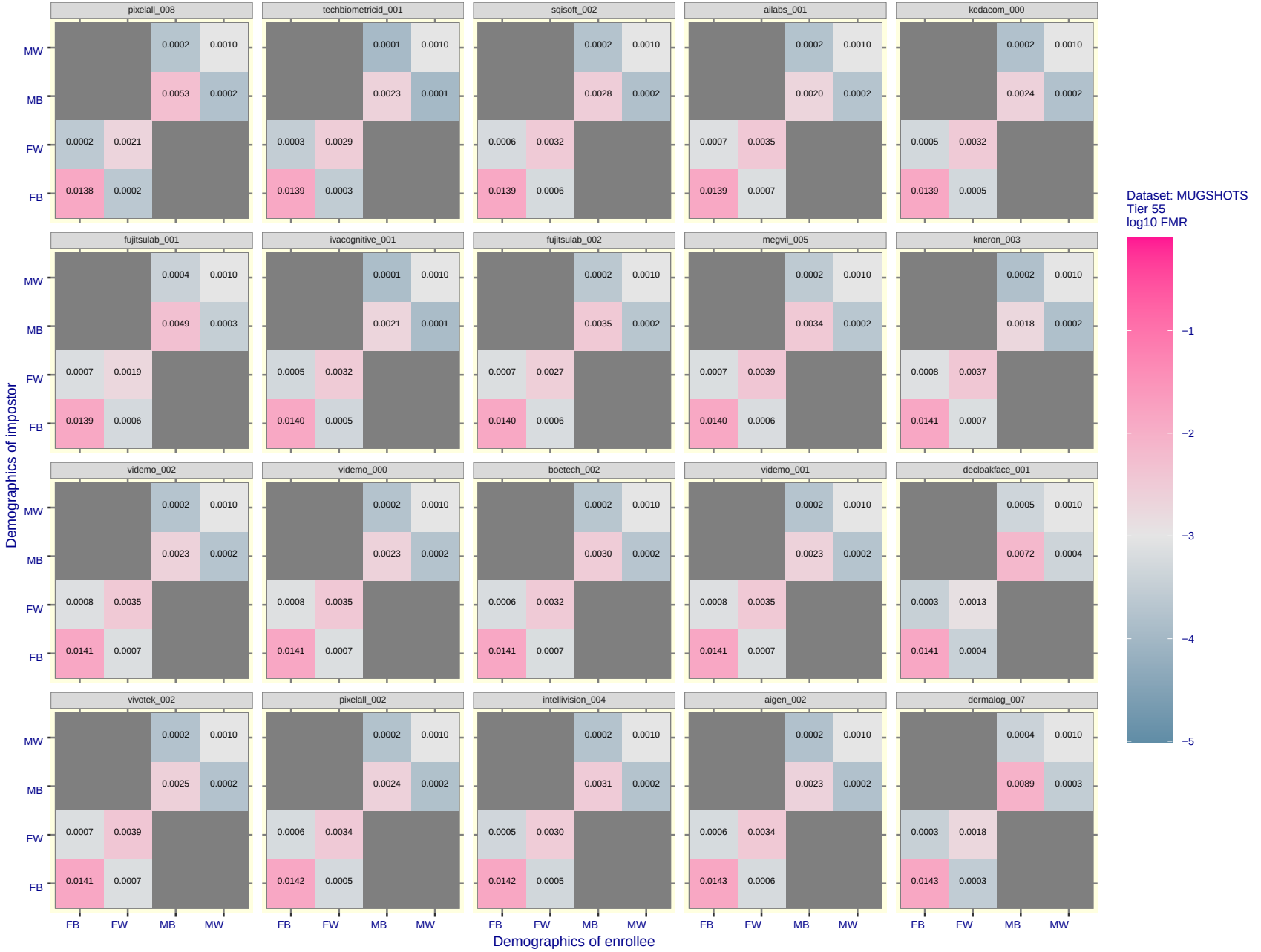

Figure 369: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

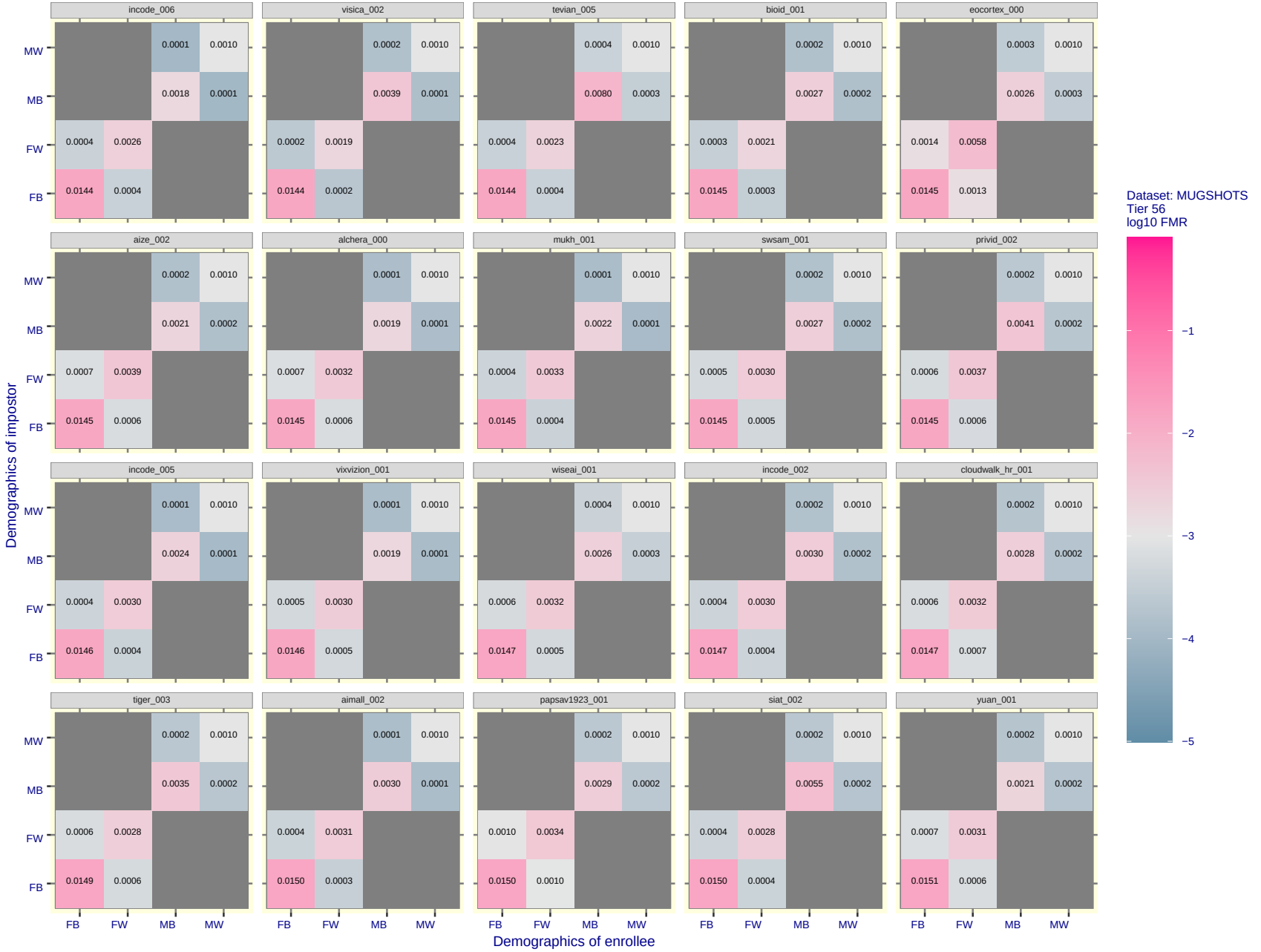

Figure 370: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

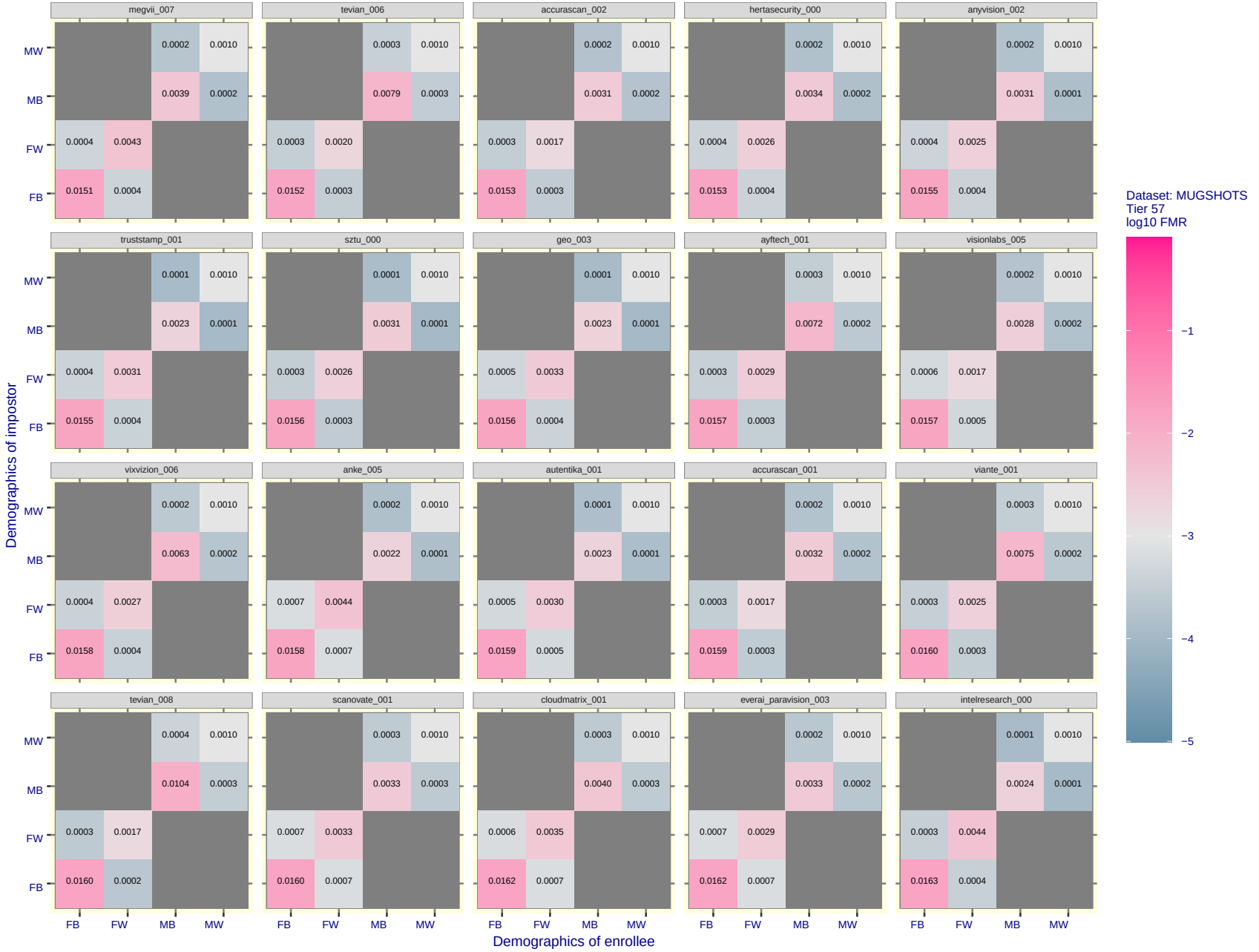

Figure 371: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

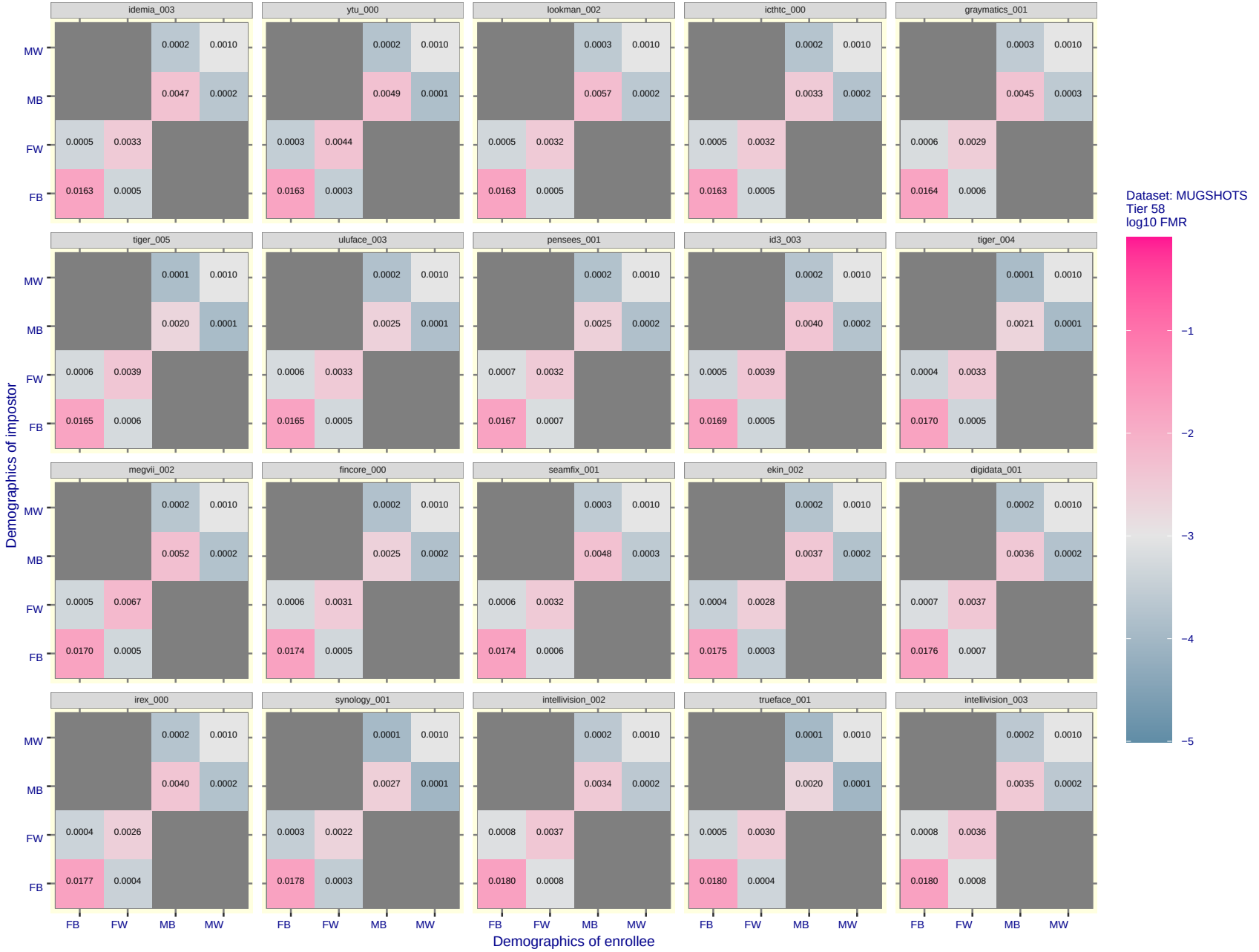

Figure 372: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

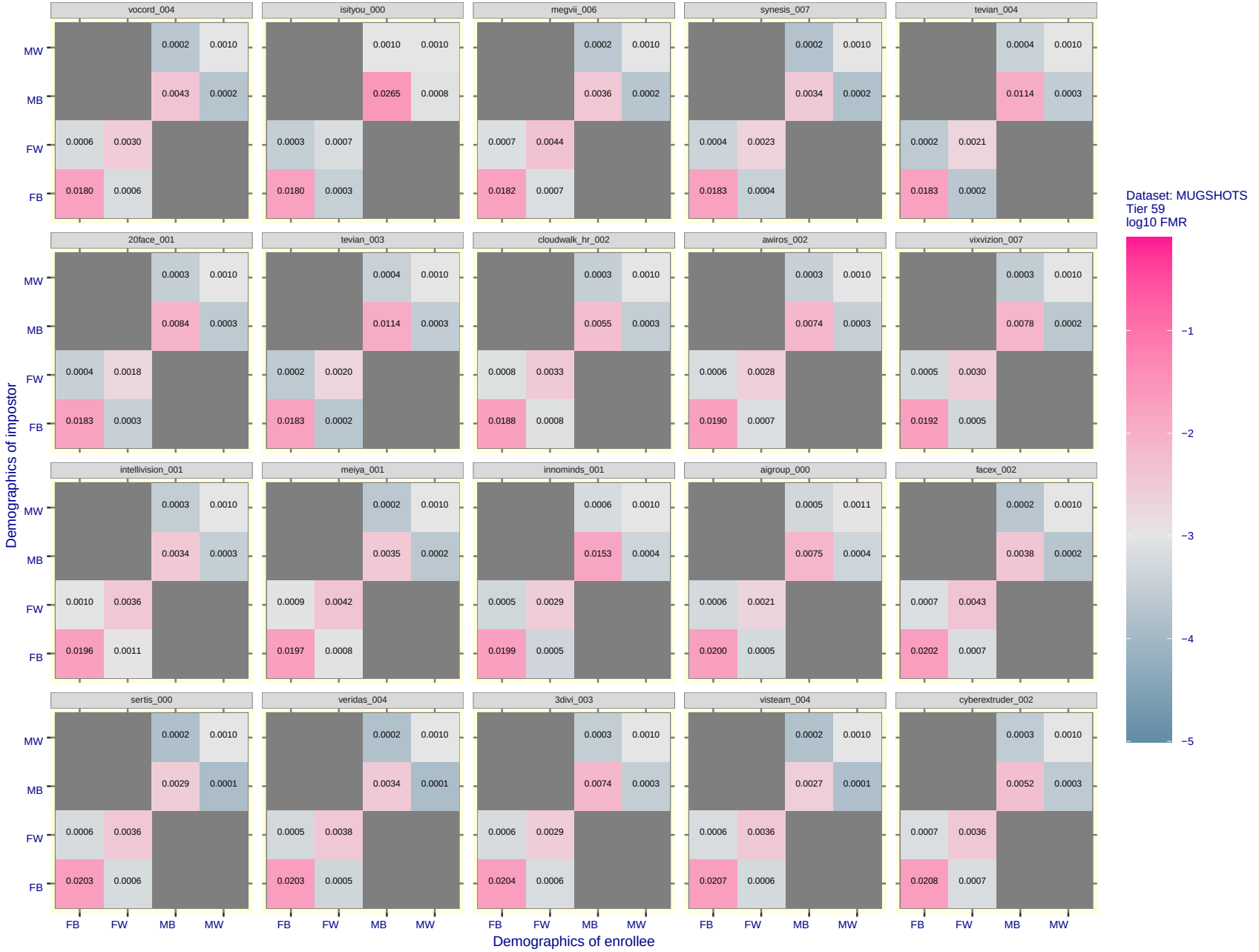

Figure 373: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

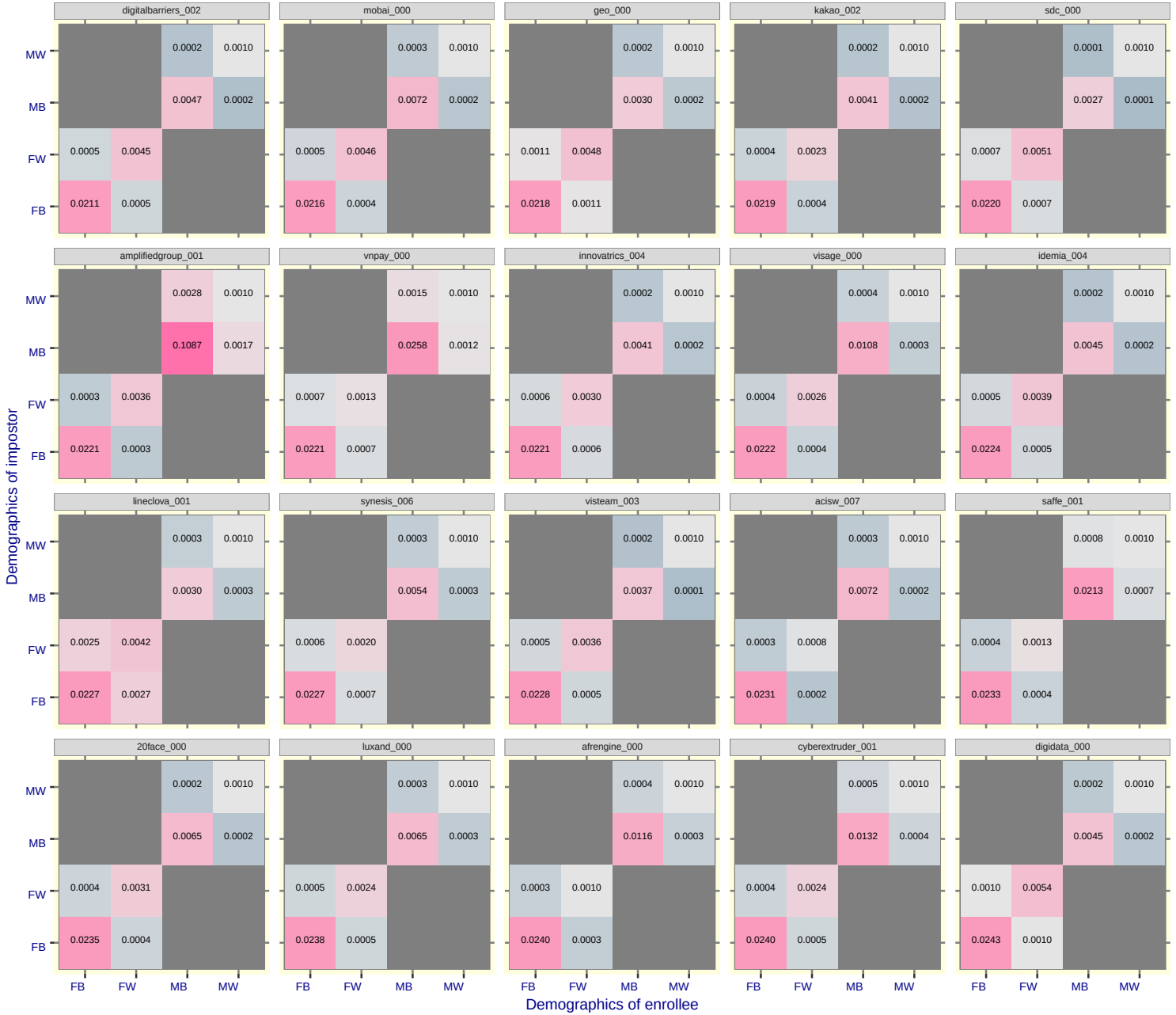

Figure 374: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

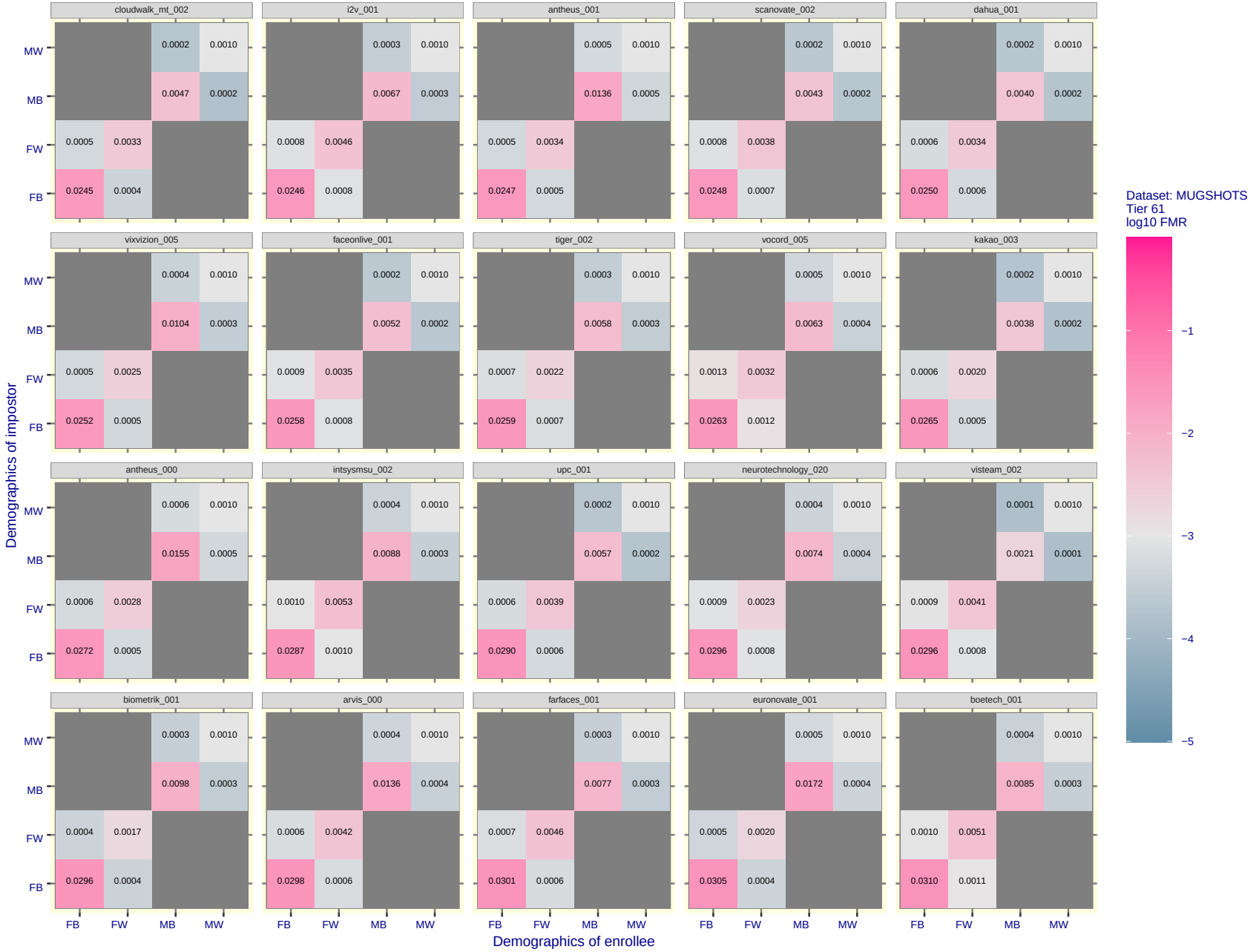

Figure 375: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

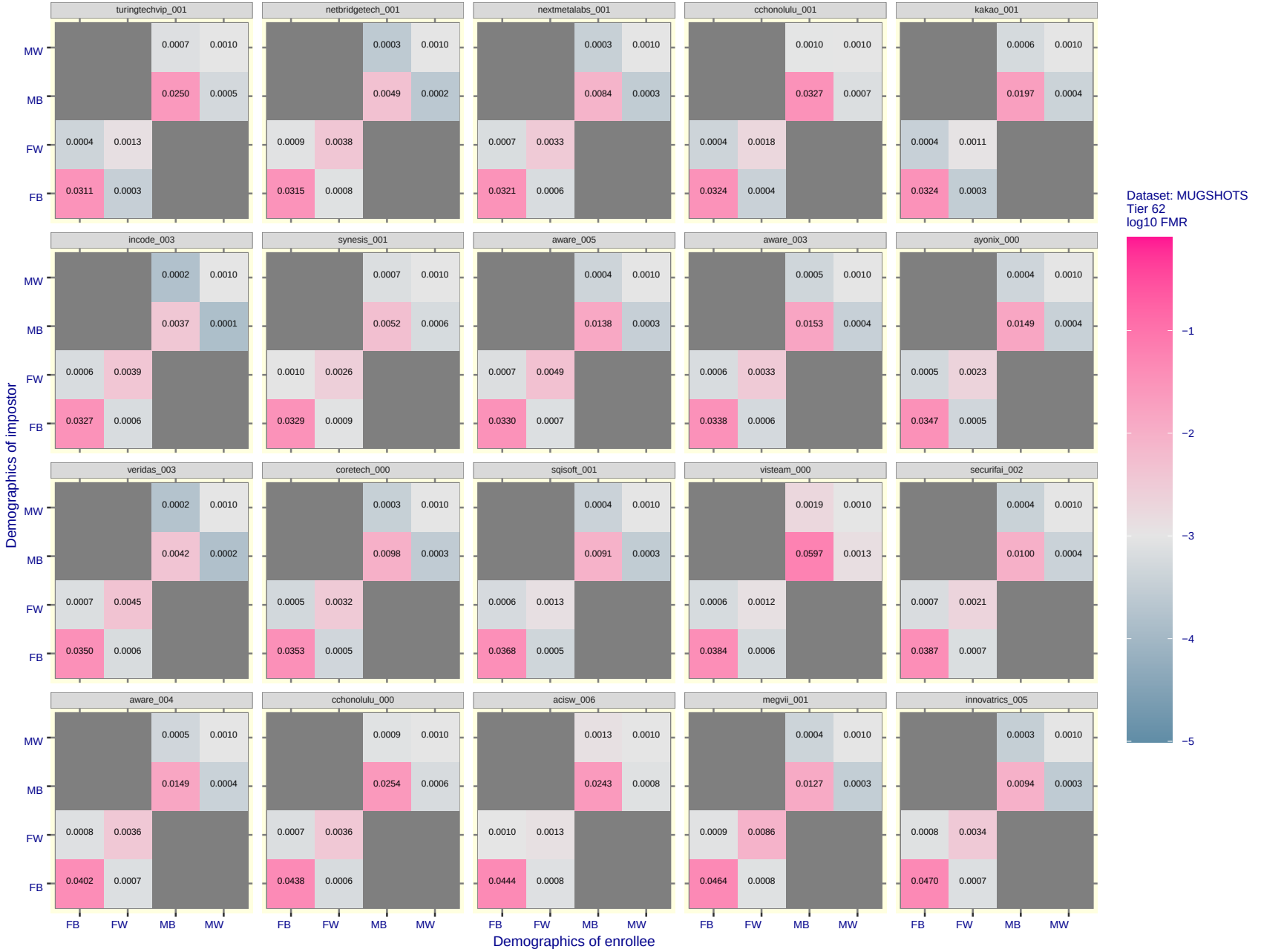

Figure 376: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

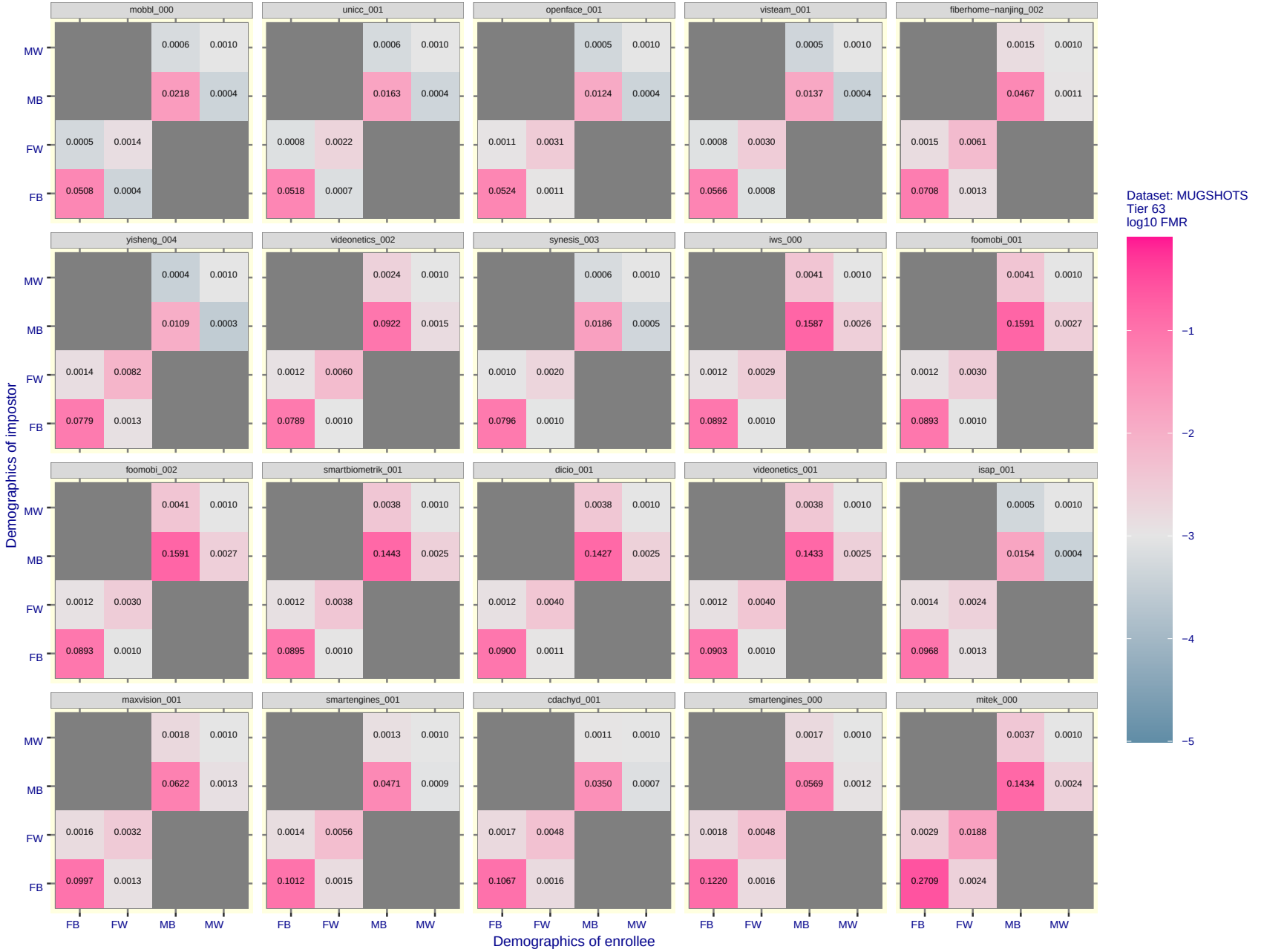

Figure 377: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

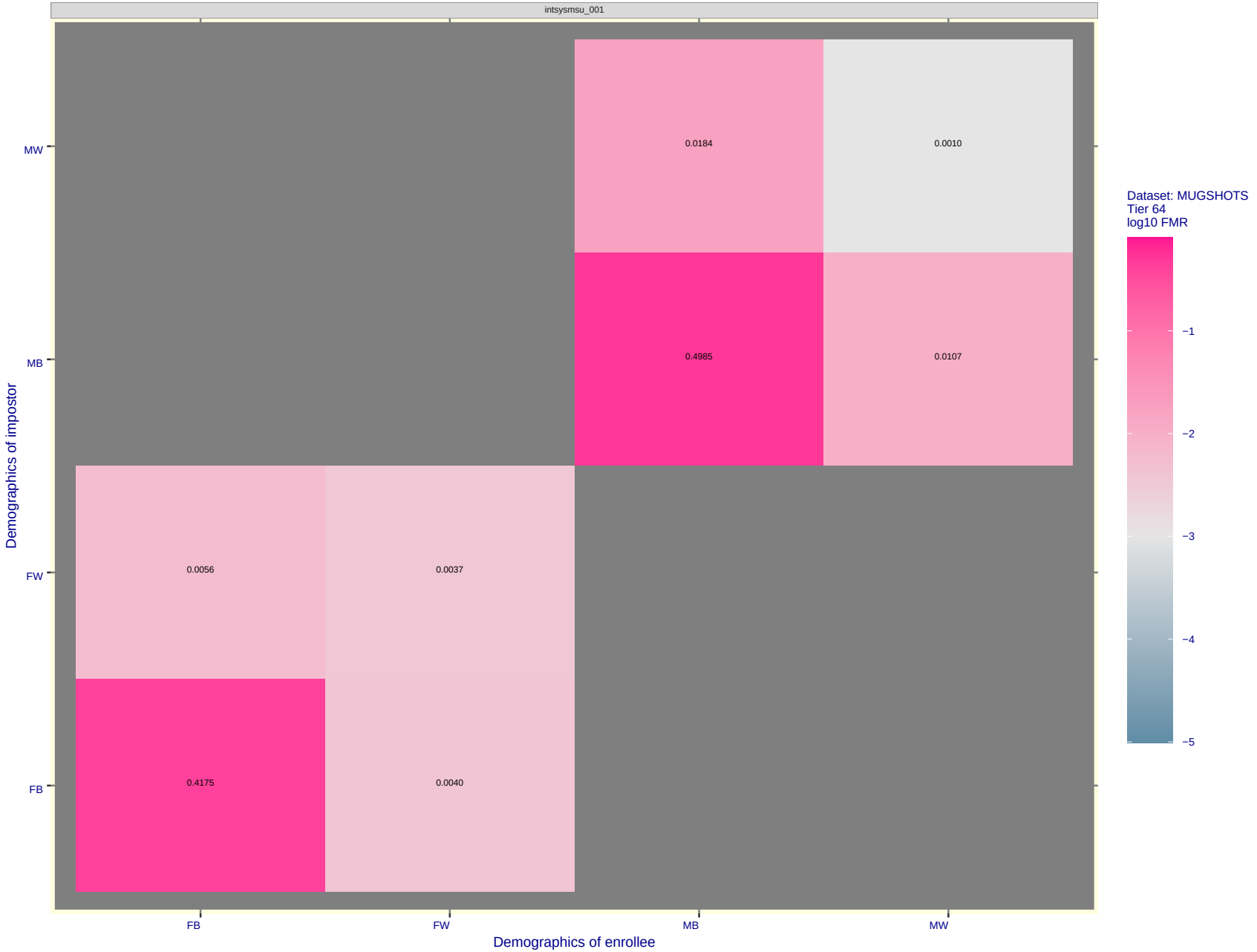

Figure 378: For the mugshot images, FMR *for same-sex impostor pairs of images annotated with codes for black female, black male, white female, white male. The threshold is set for each algorithm to give* FMR *= 0.001 for white males which is the demographic that usually gives the lowest* FMR*. This means the top right box is the same color in all panels. The panels are sorted over multiple pages in order of* FMR *on black females, which is the demographc that usually gives the highest* FMR*.*

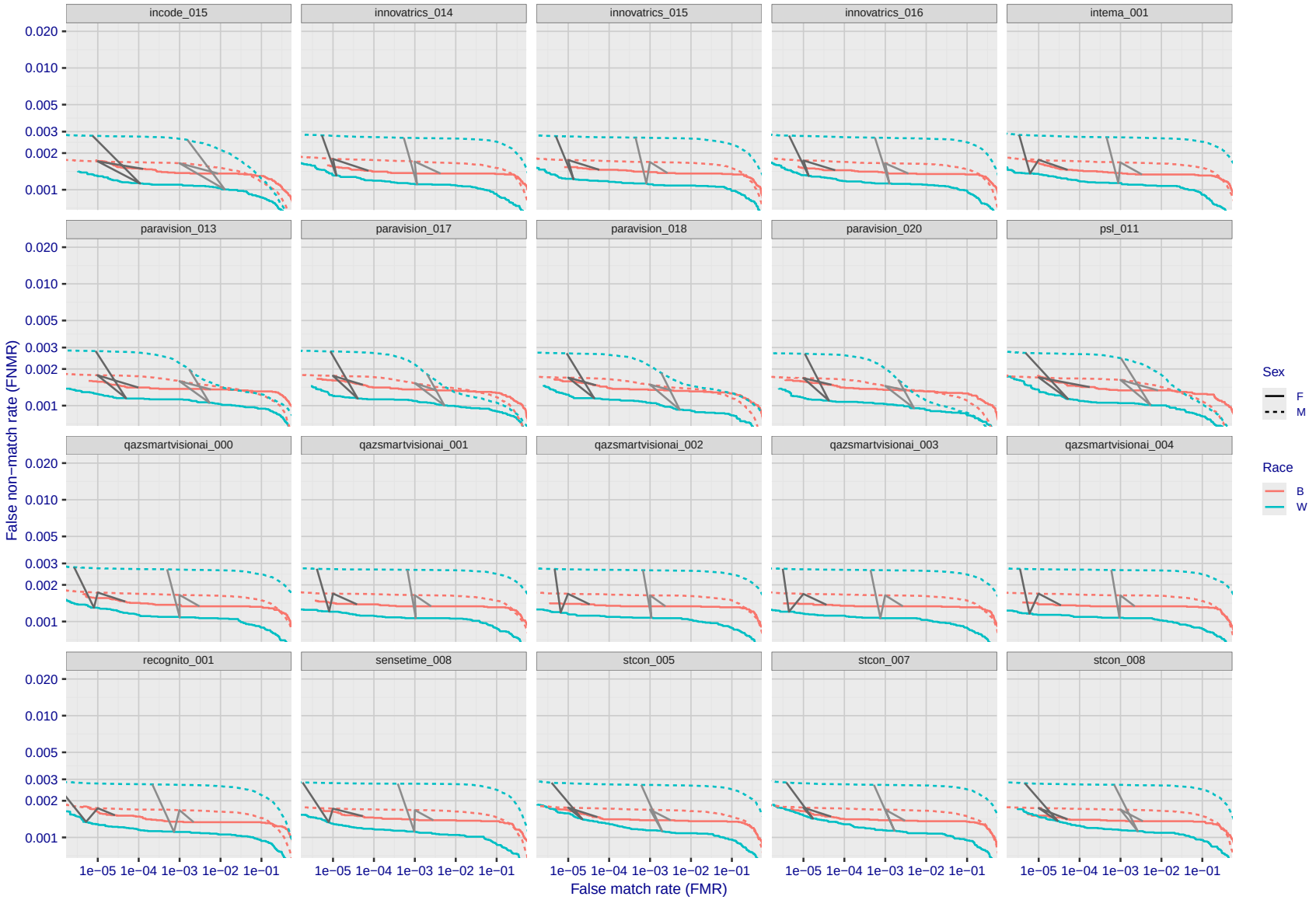

Figure 379: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

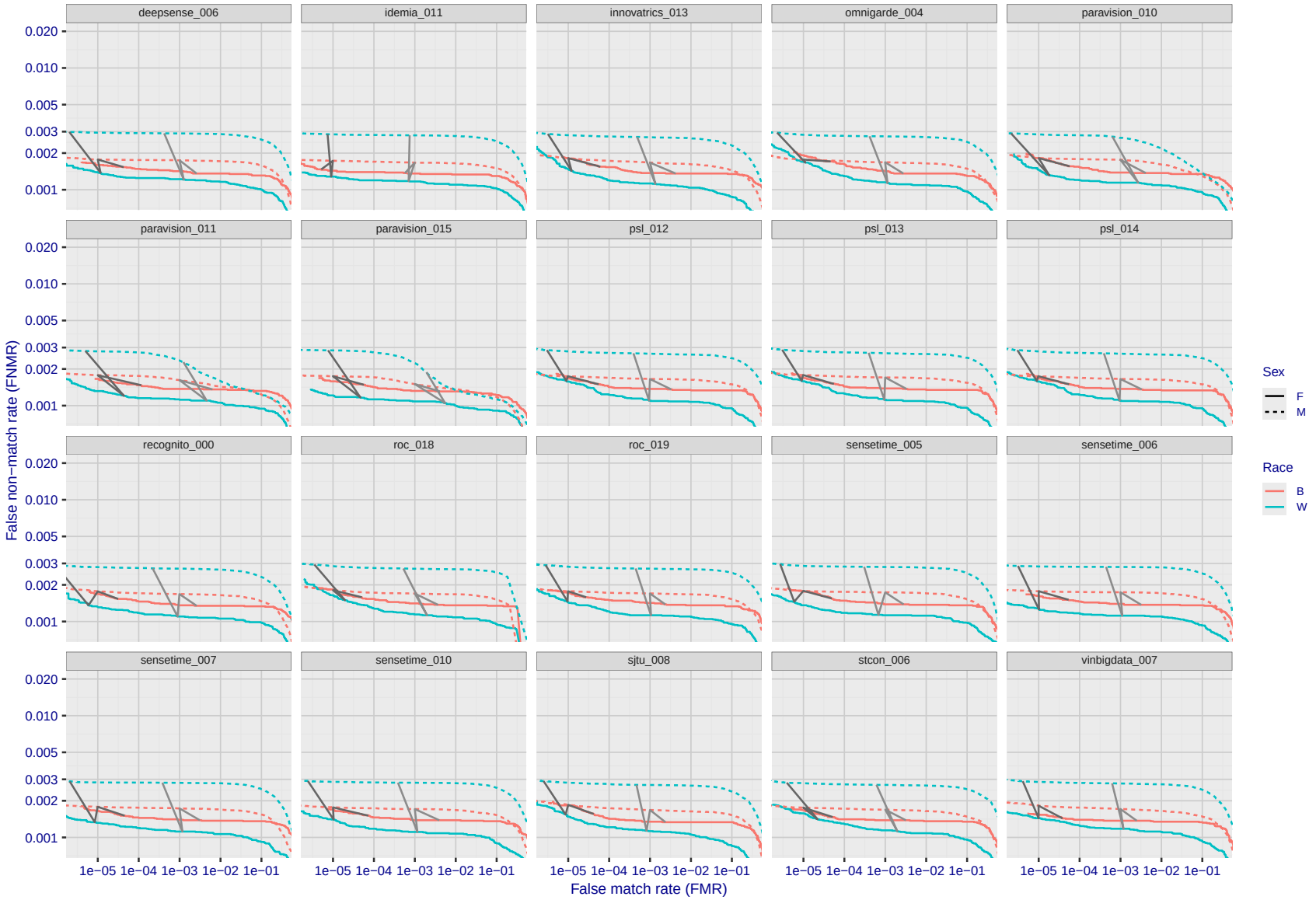

Figure 380: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

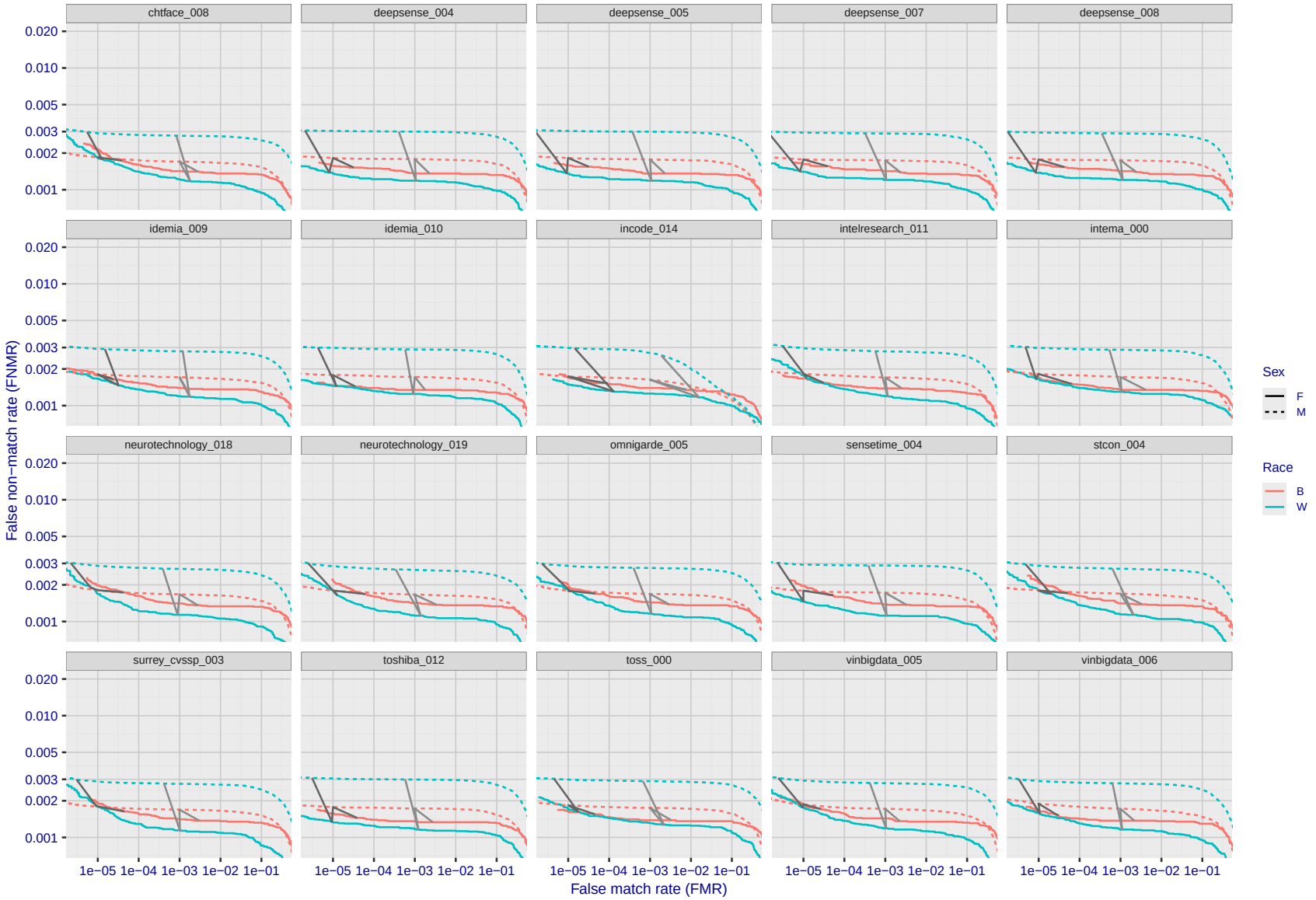

Figure 381: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

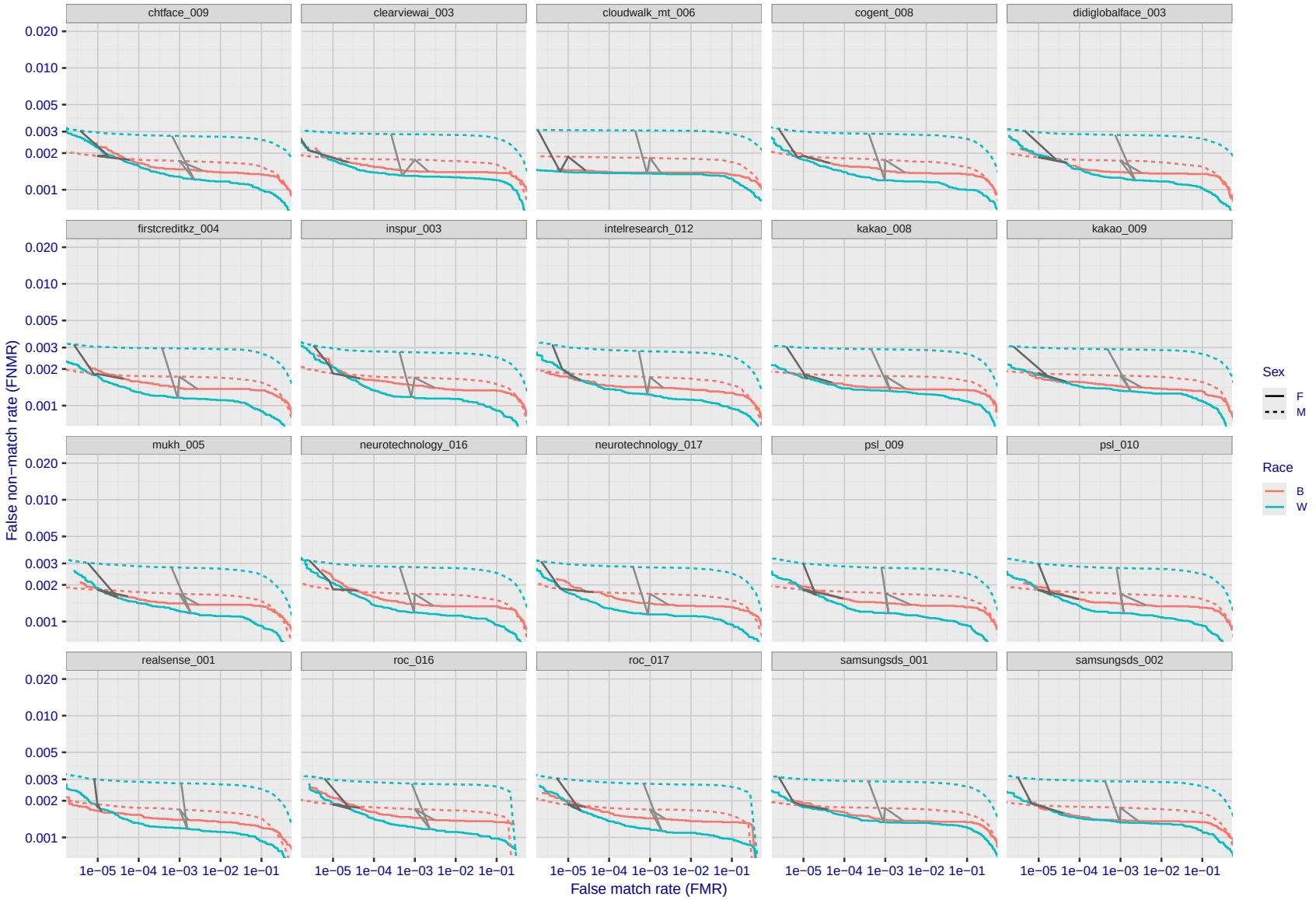

Figure 382: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

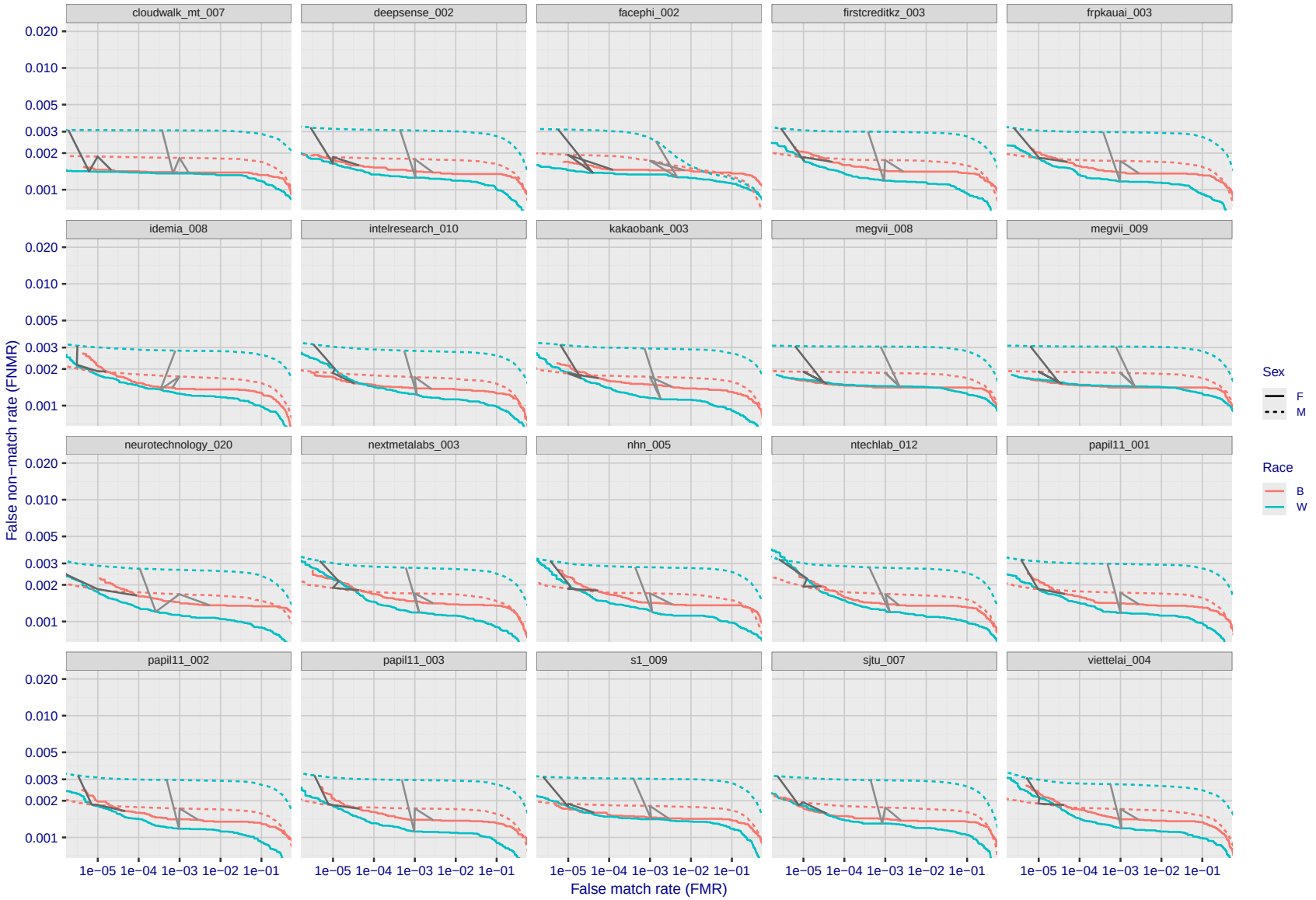

Figure 383: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

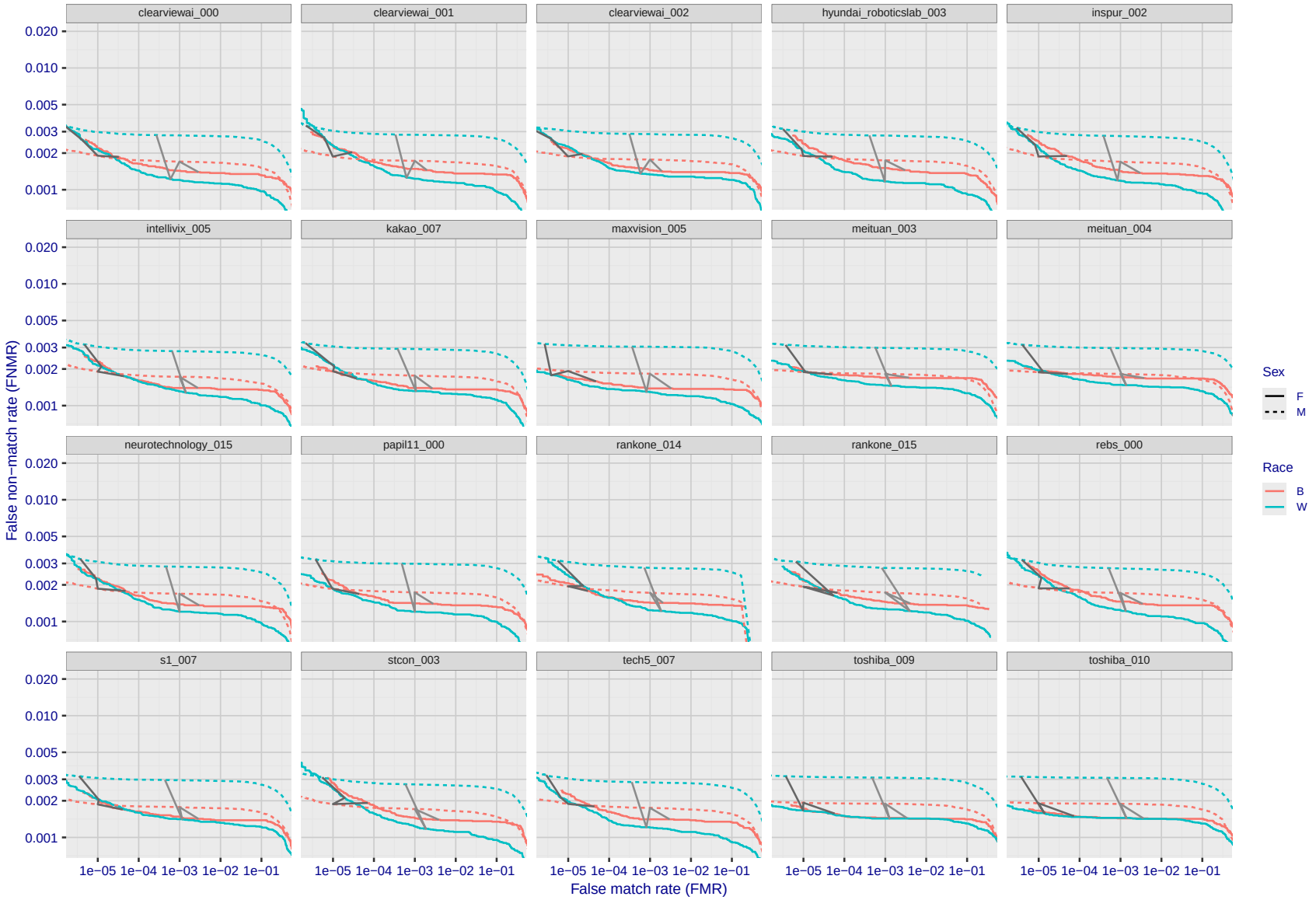

Figure 384: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

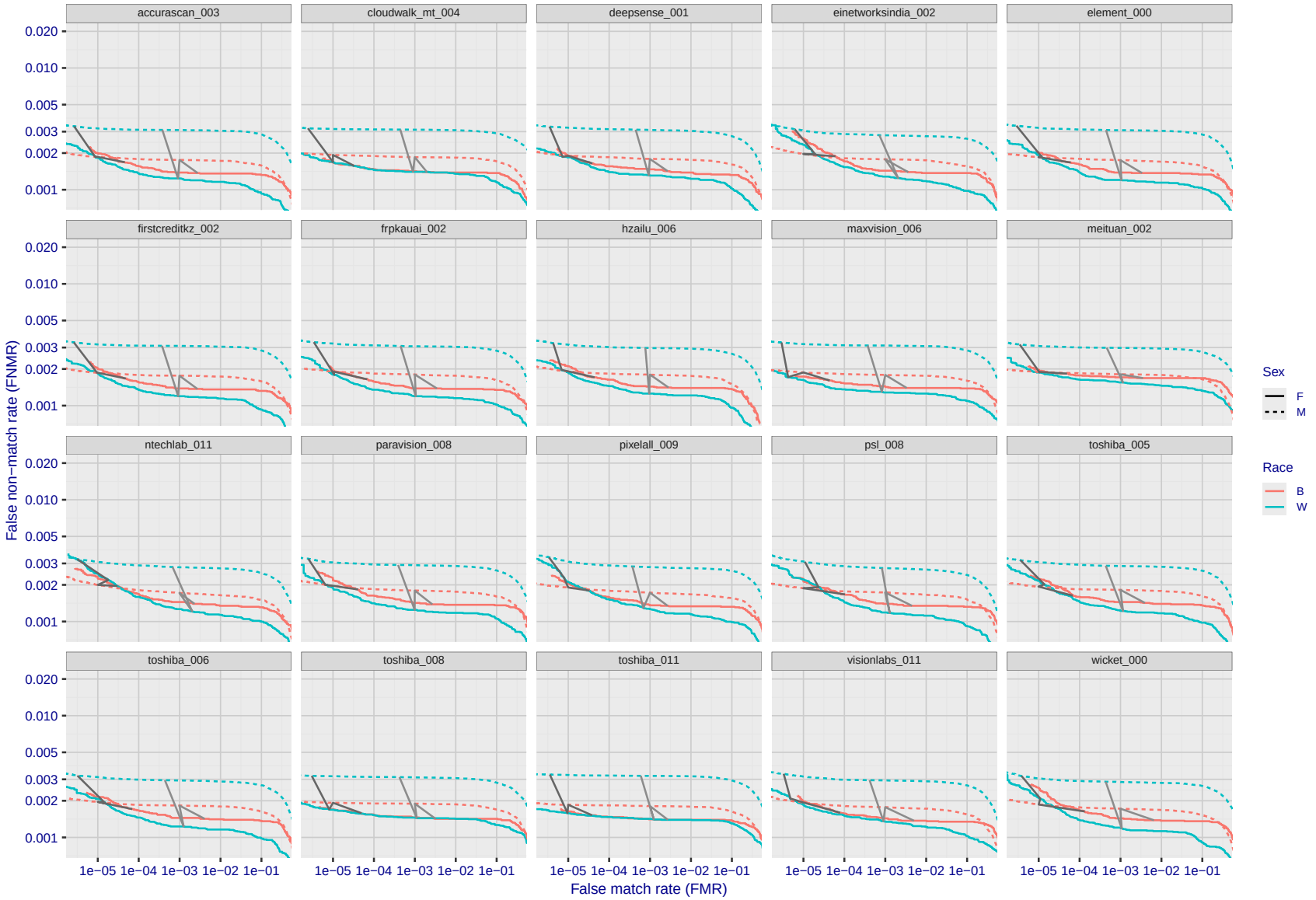

Figure 385: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

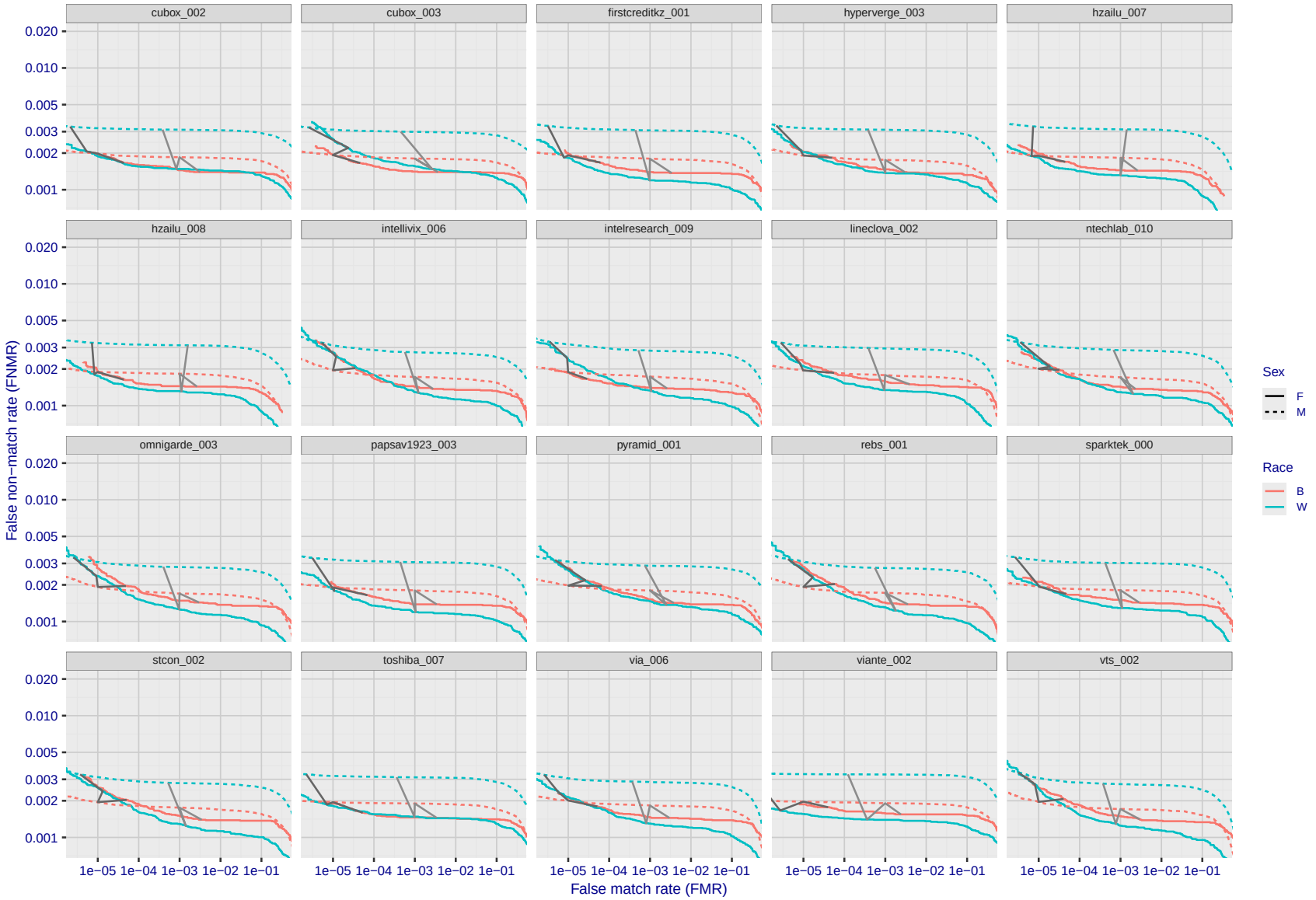

Figure 386: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

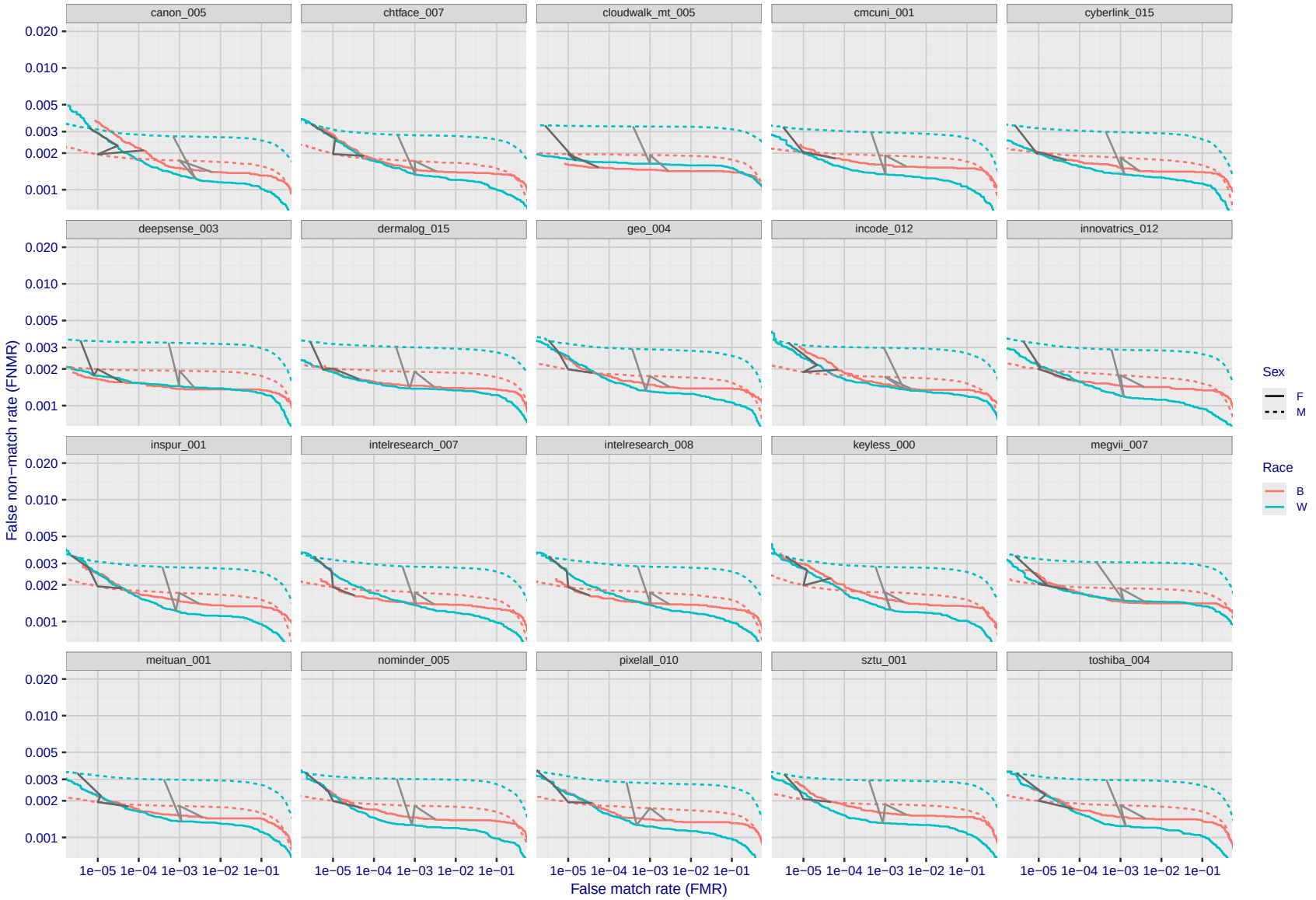

Figure 387: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

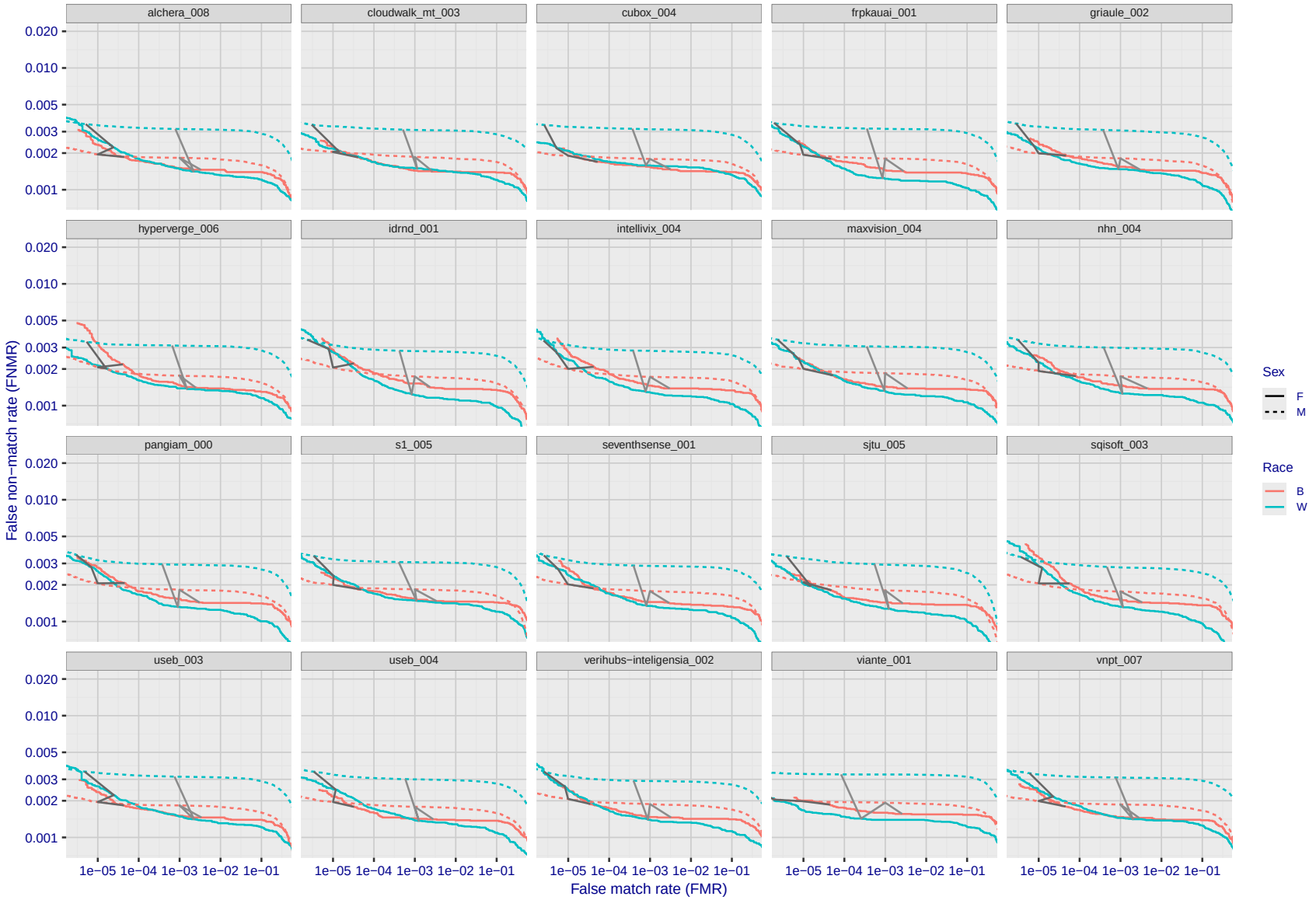

Figure 388: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

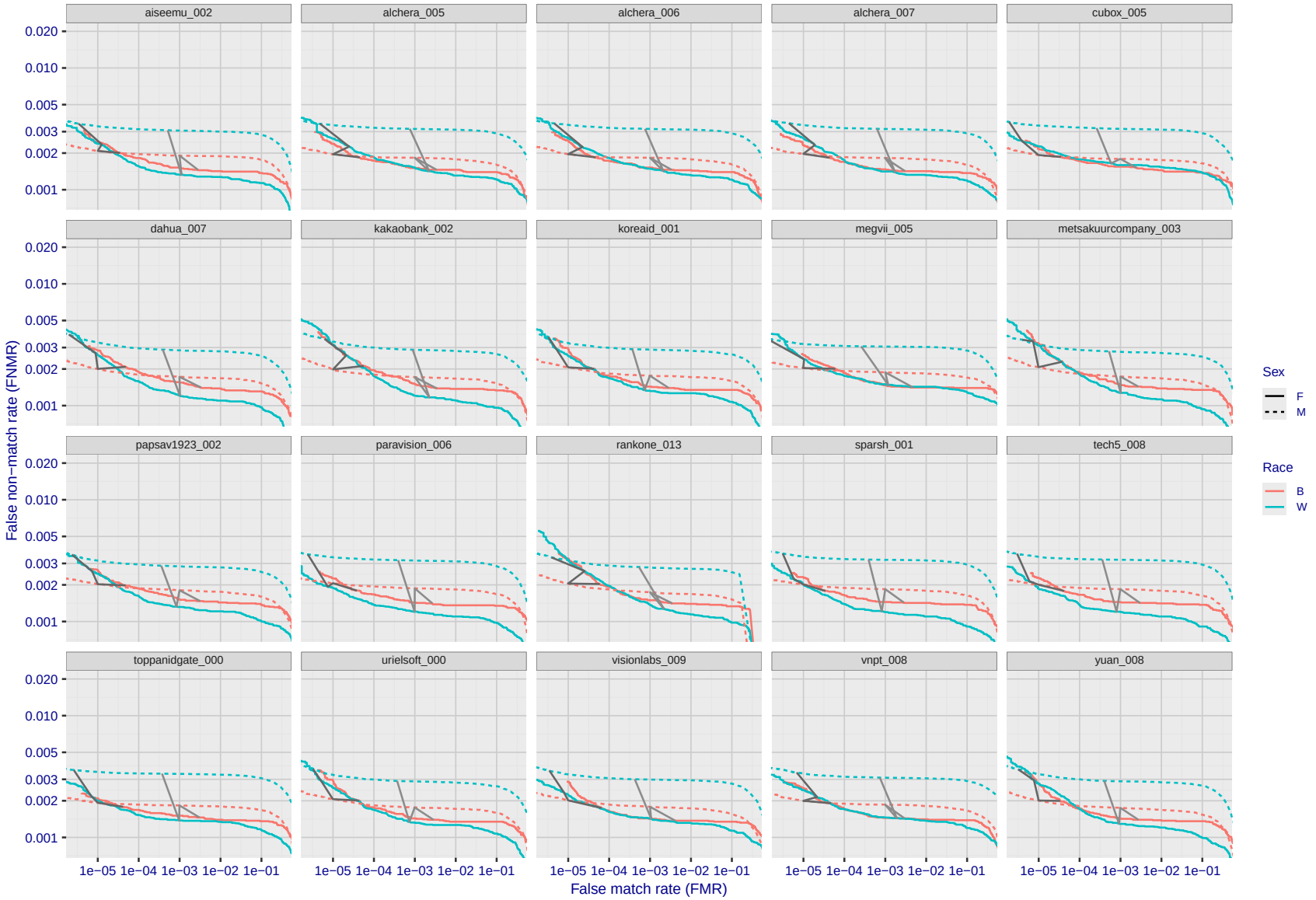

Figure 389: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

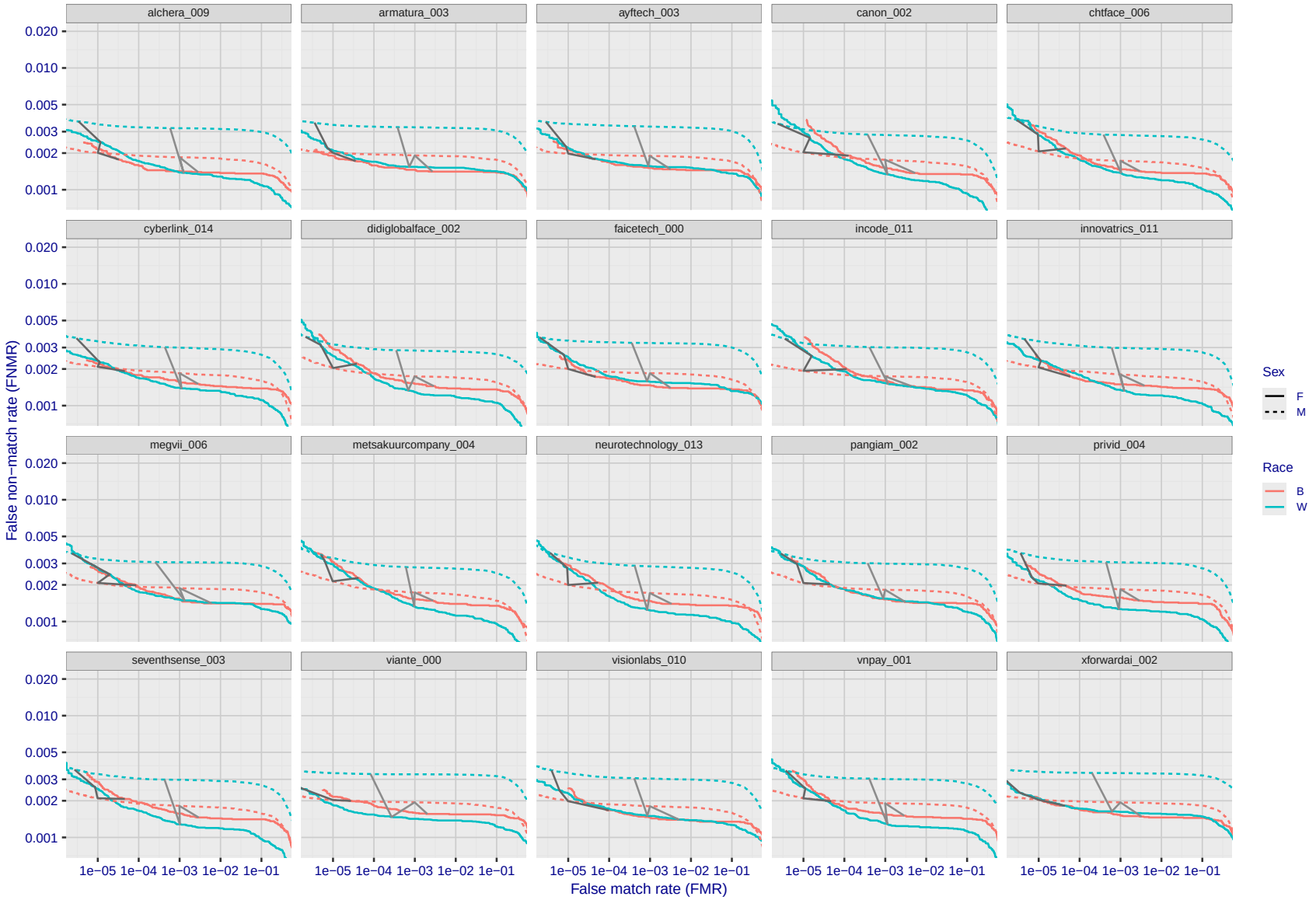

Figure 390: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

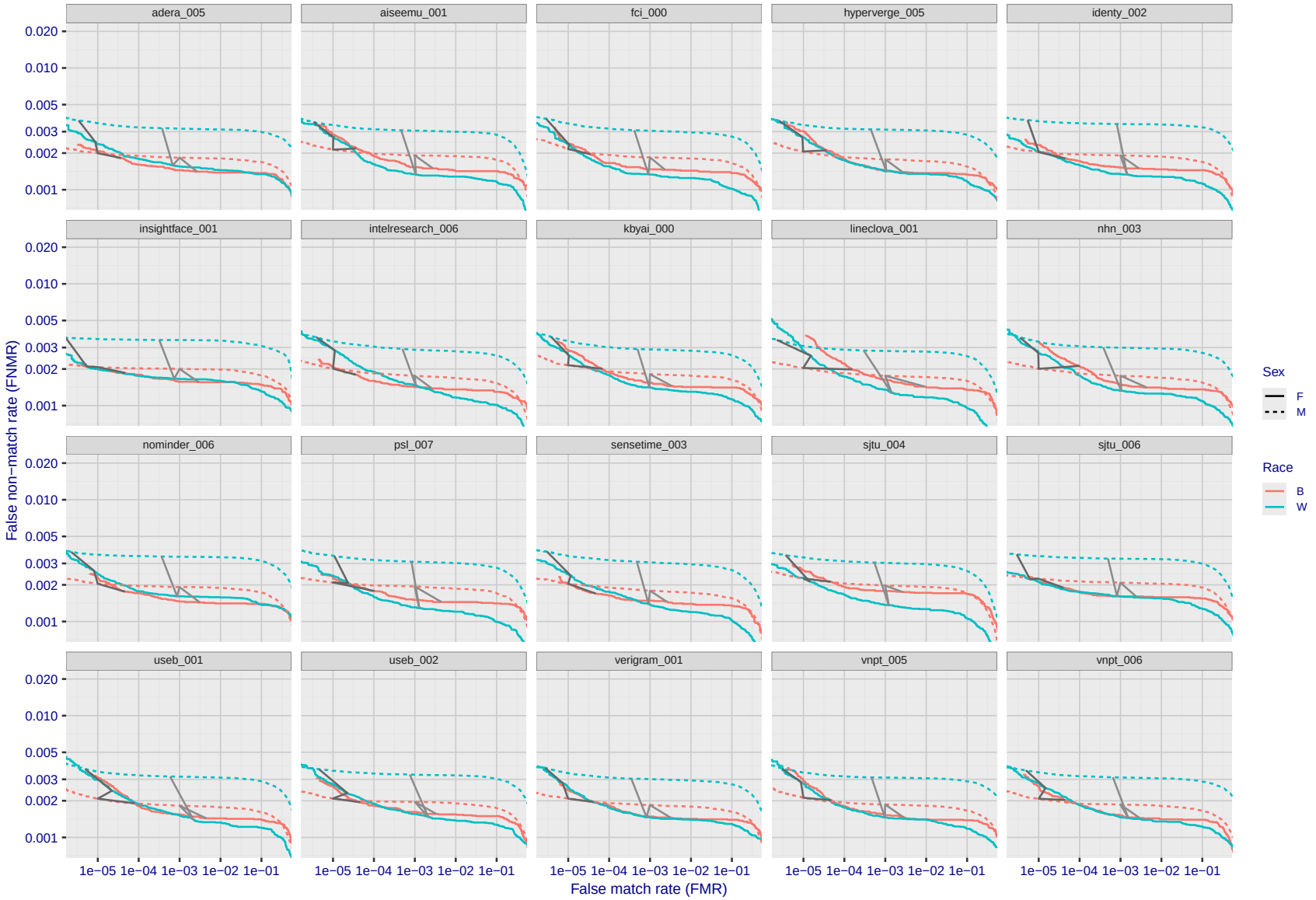

Figure 391: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

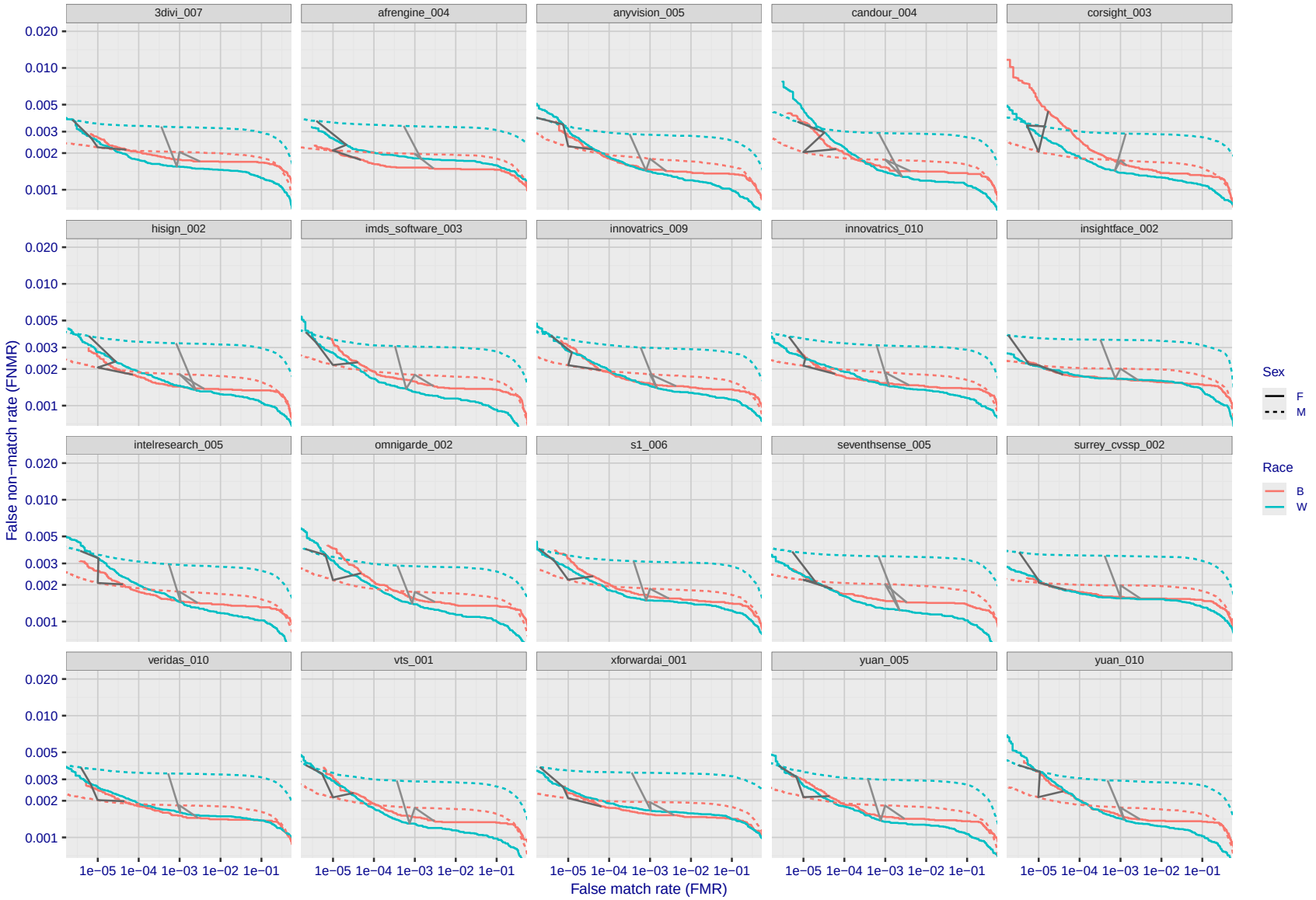

Figure 392: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

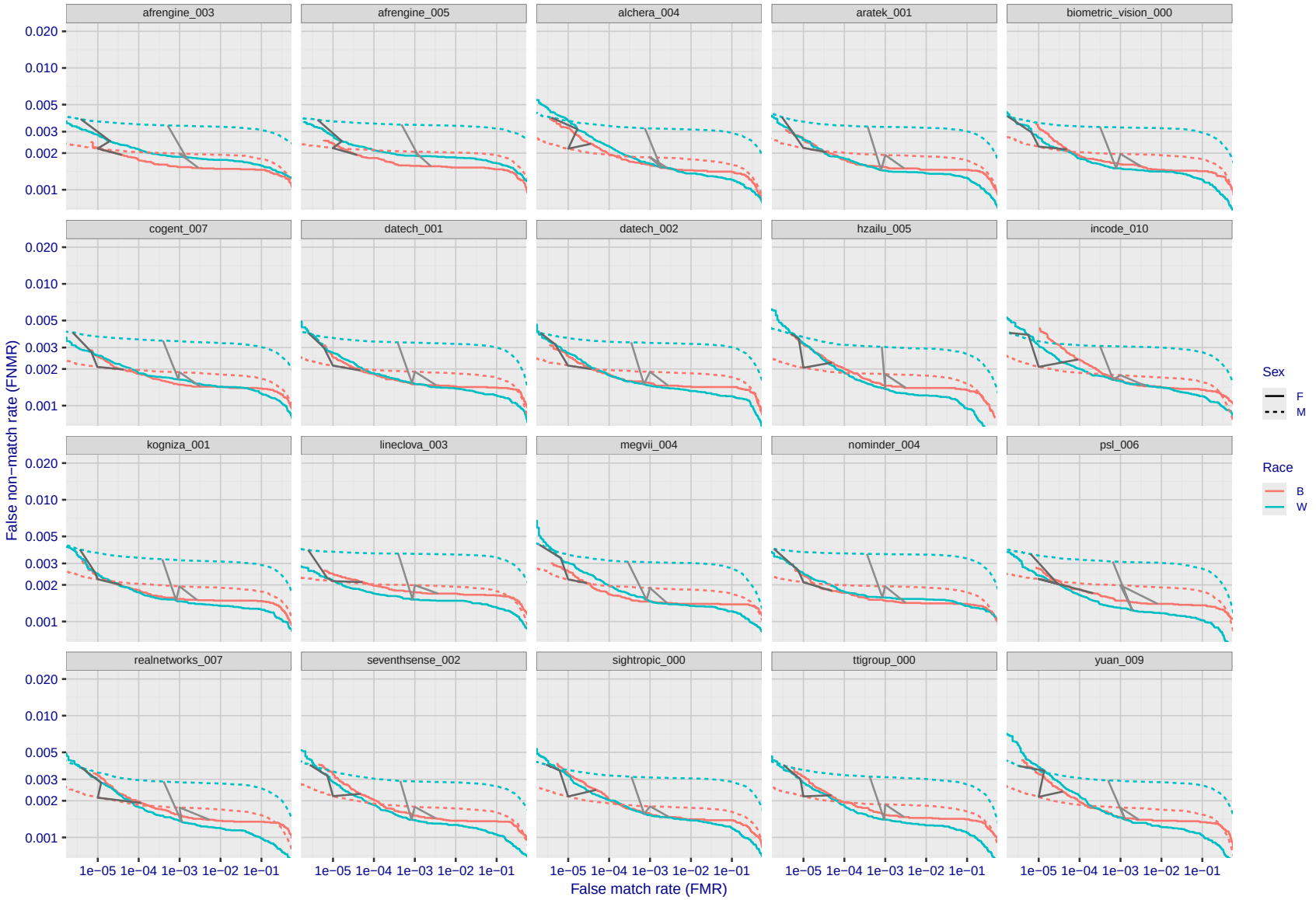

Figure 393: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

FNMR(T) "False non-match rate"
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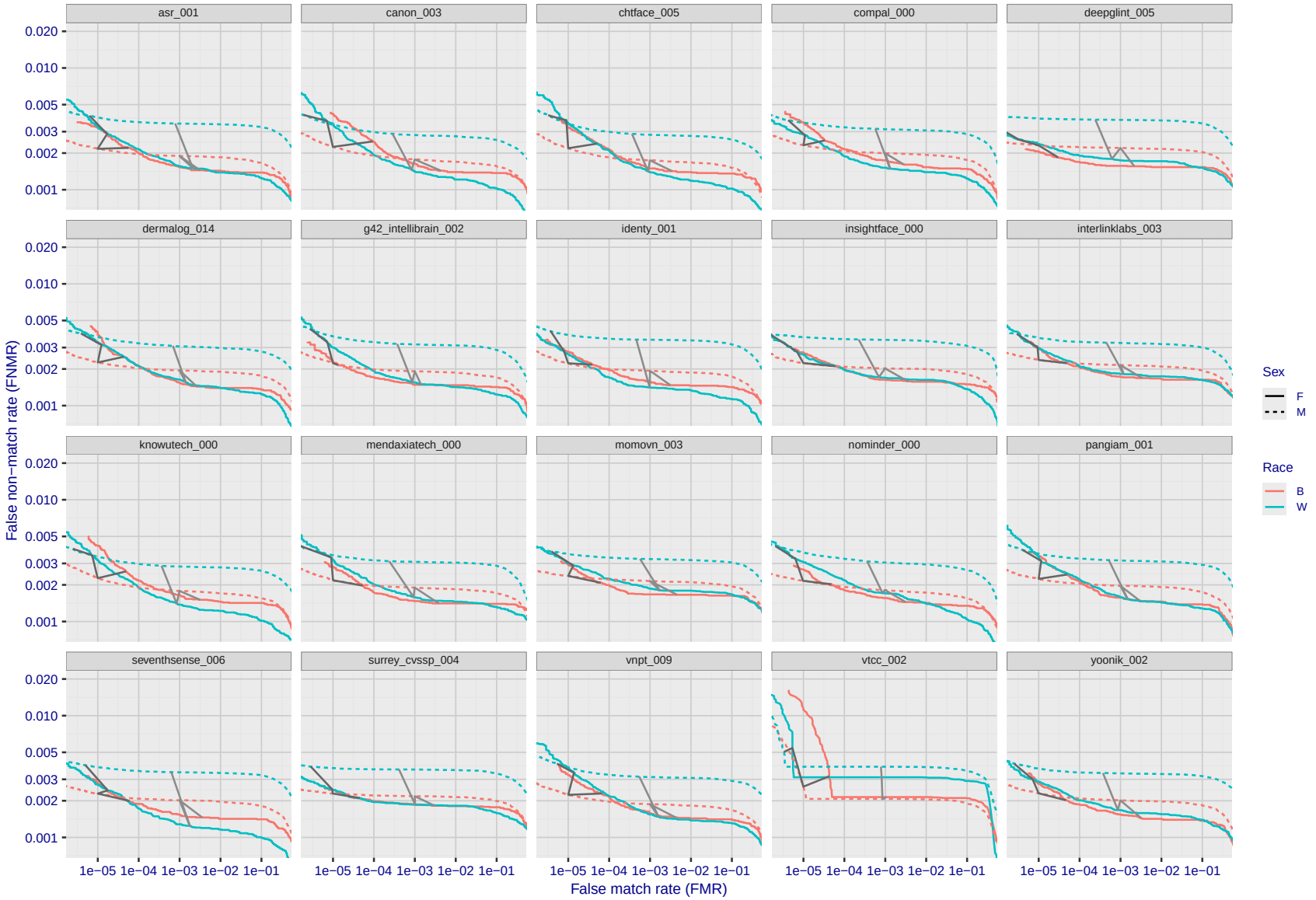


Figure 394: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

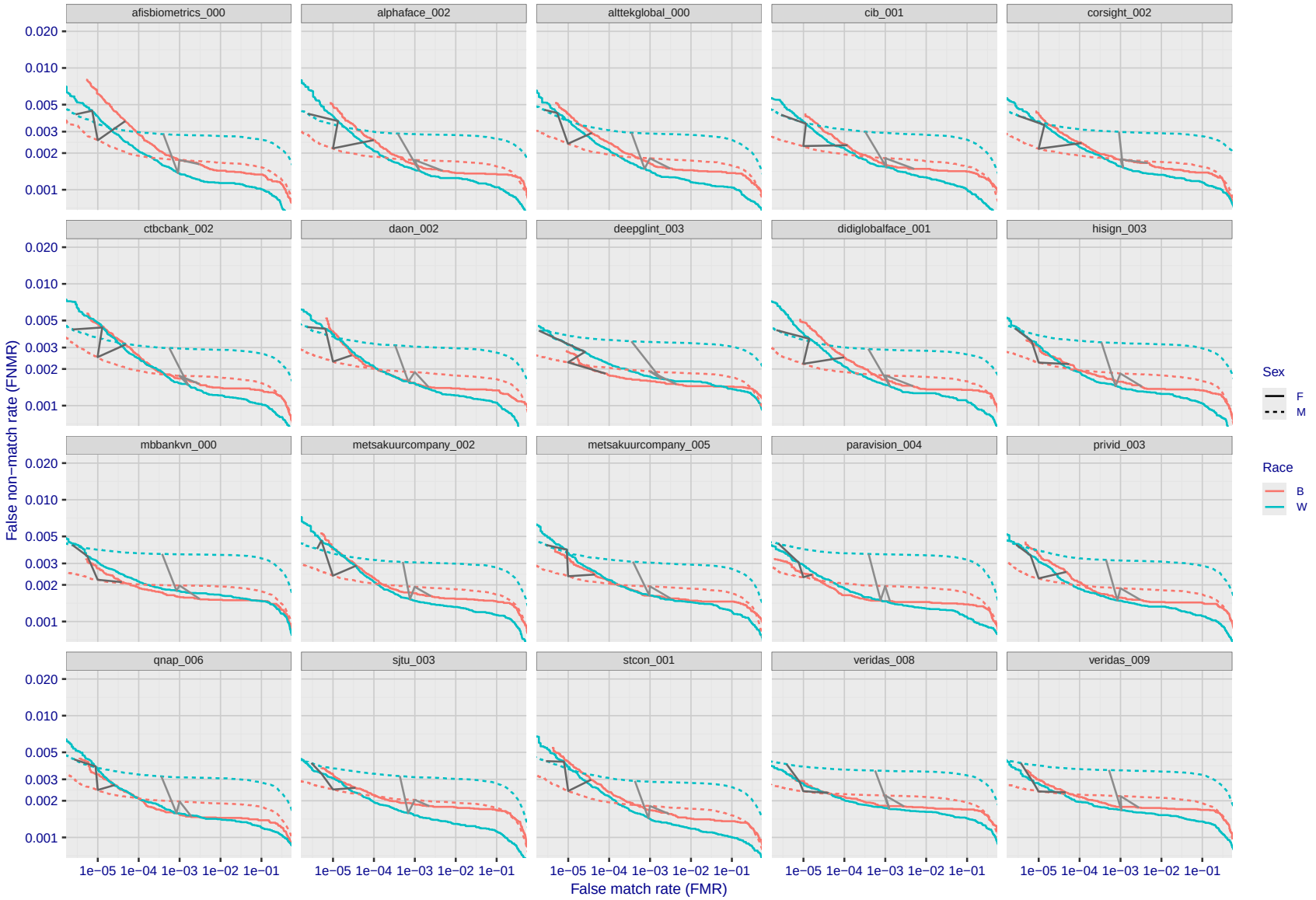
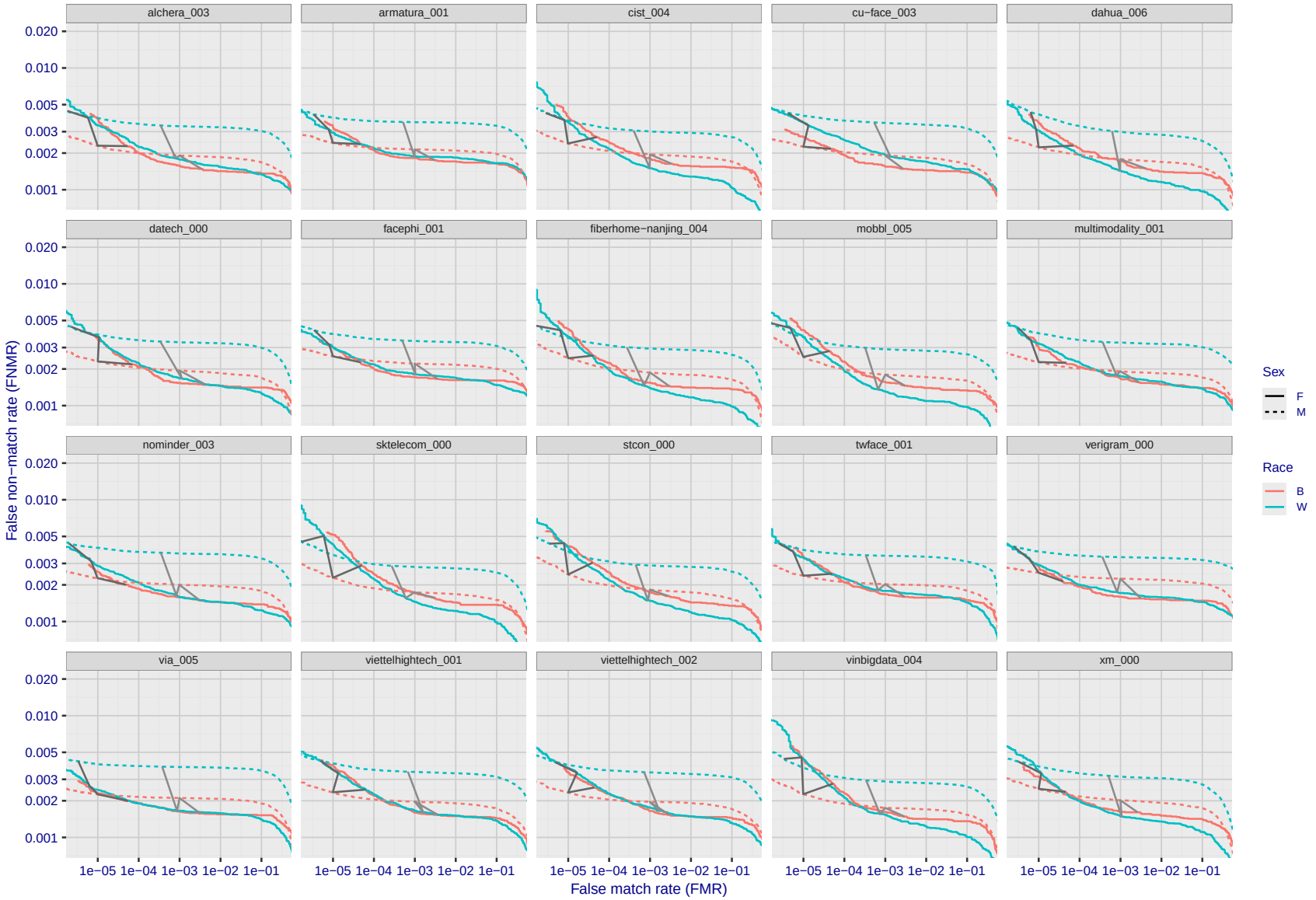


Figure 395: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*



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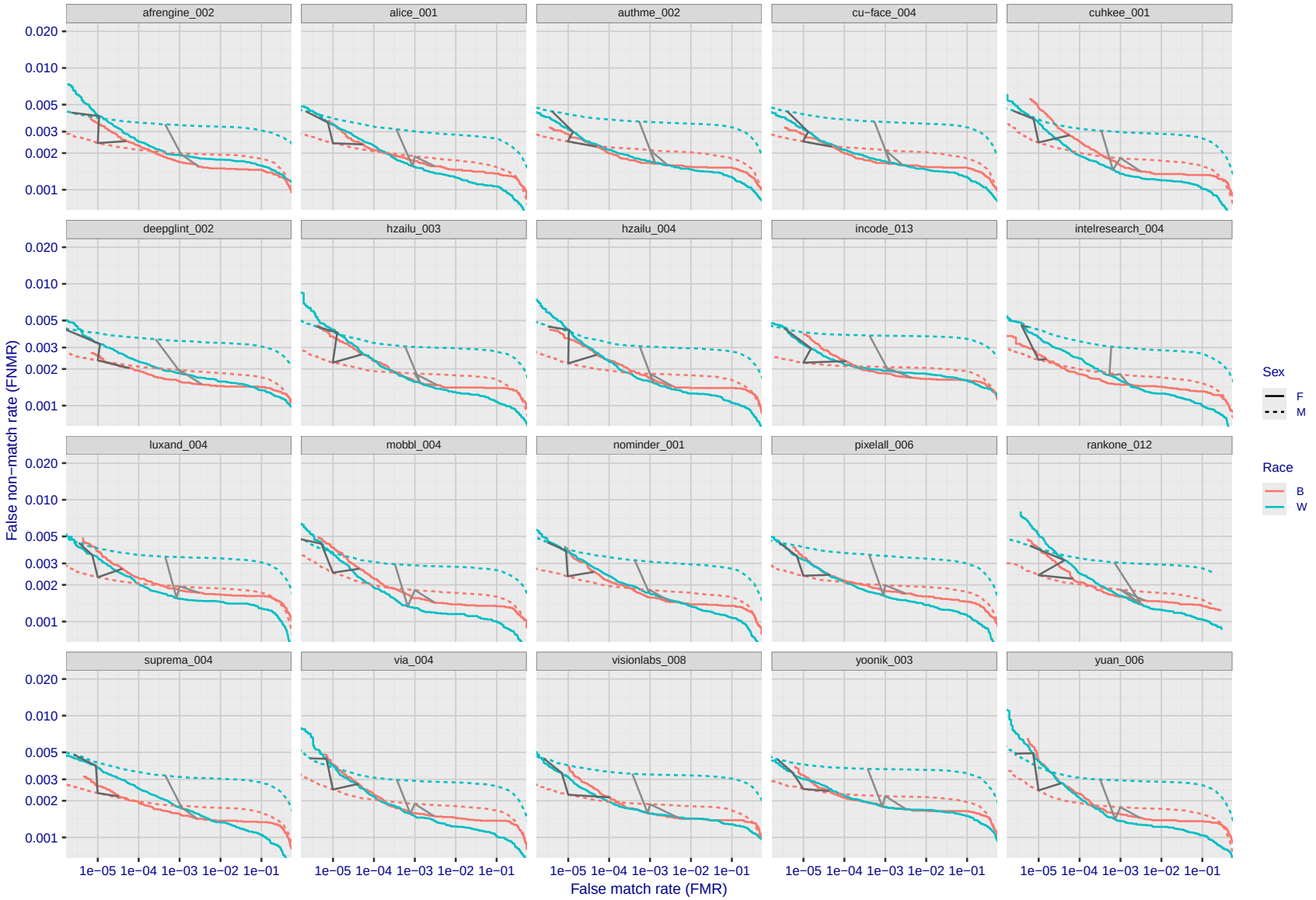
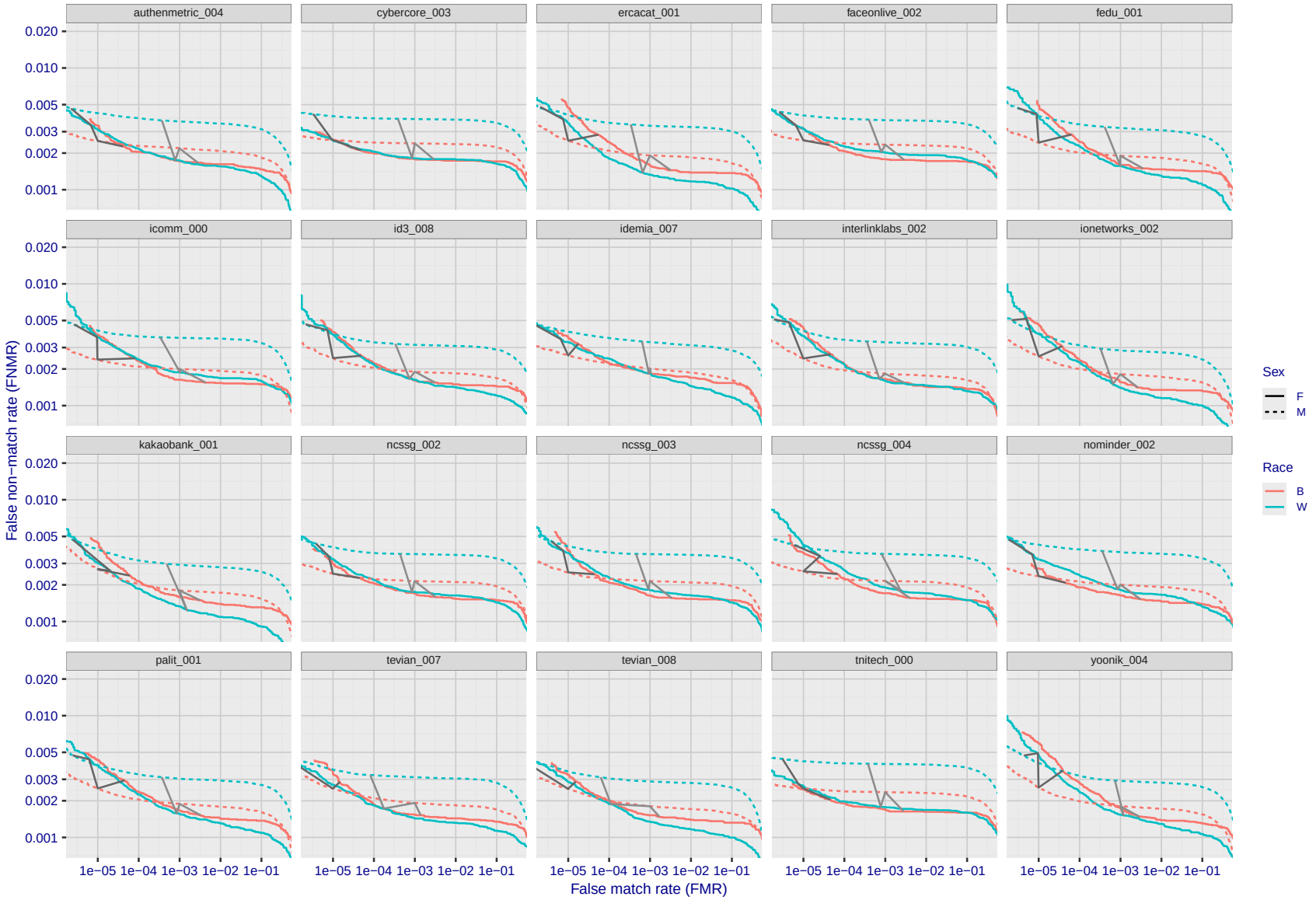


Figure 397: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*



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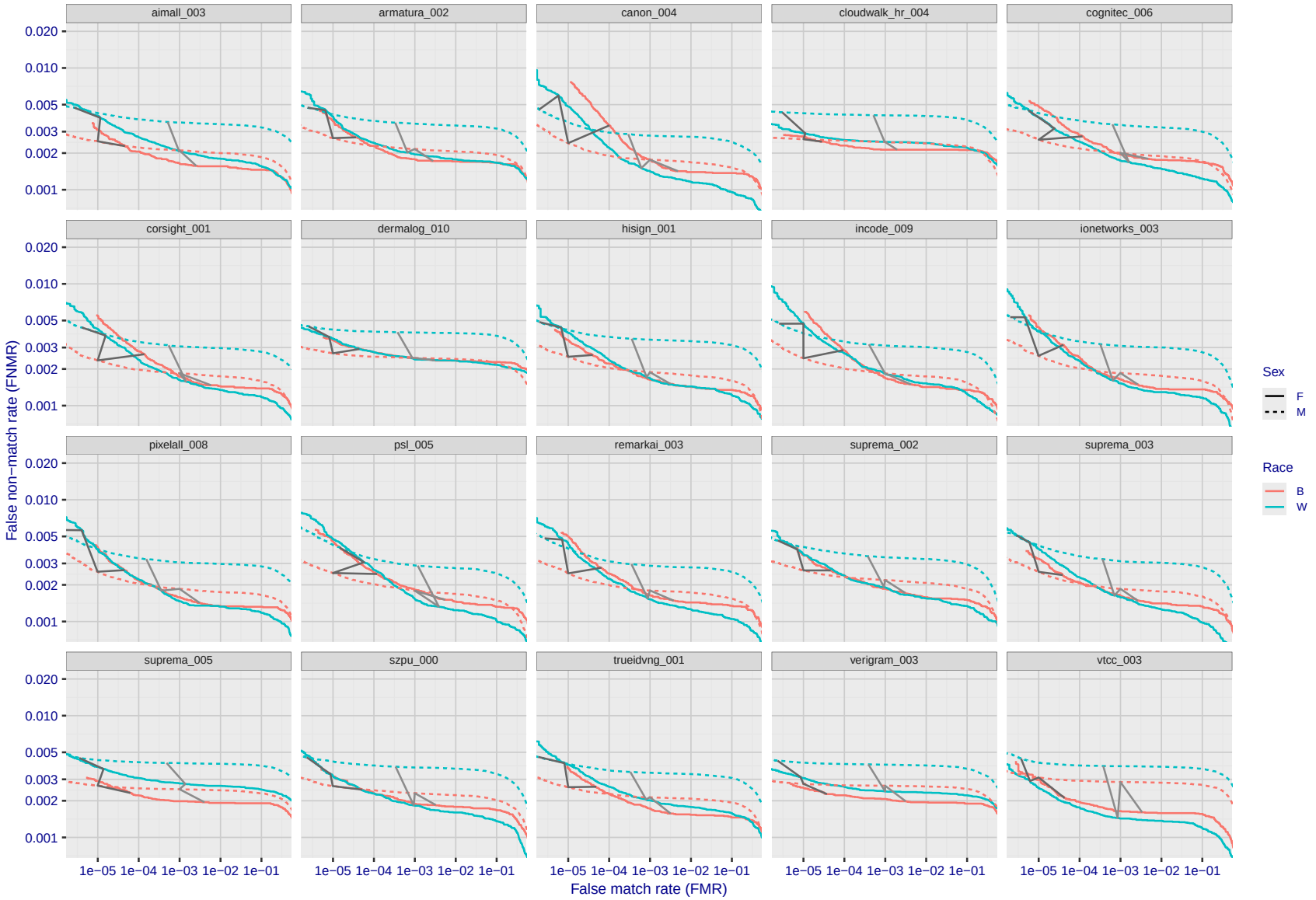

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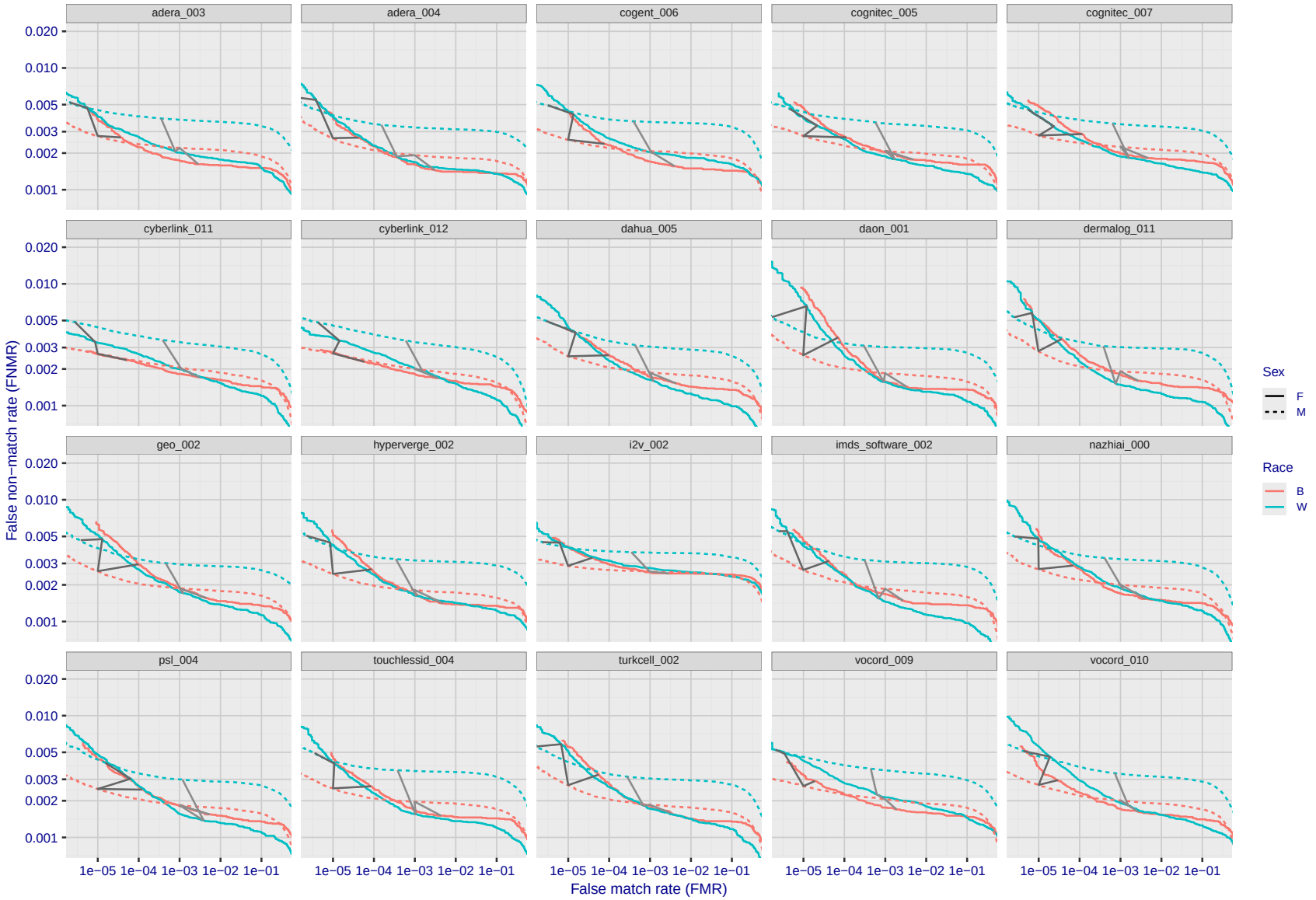

Figure 400: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

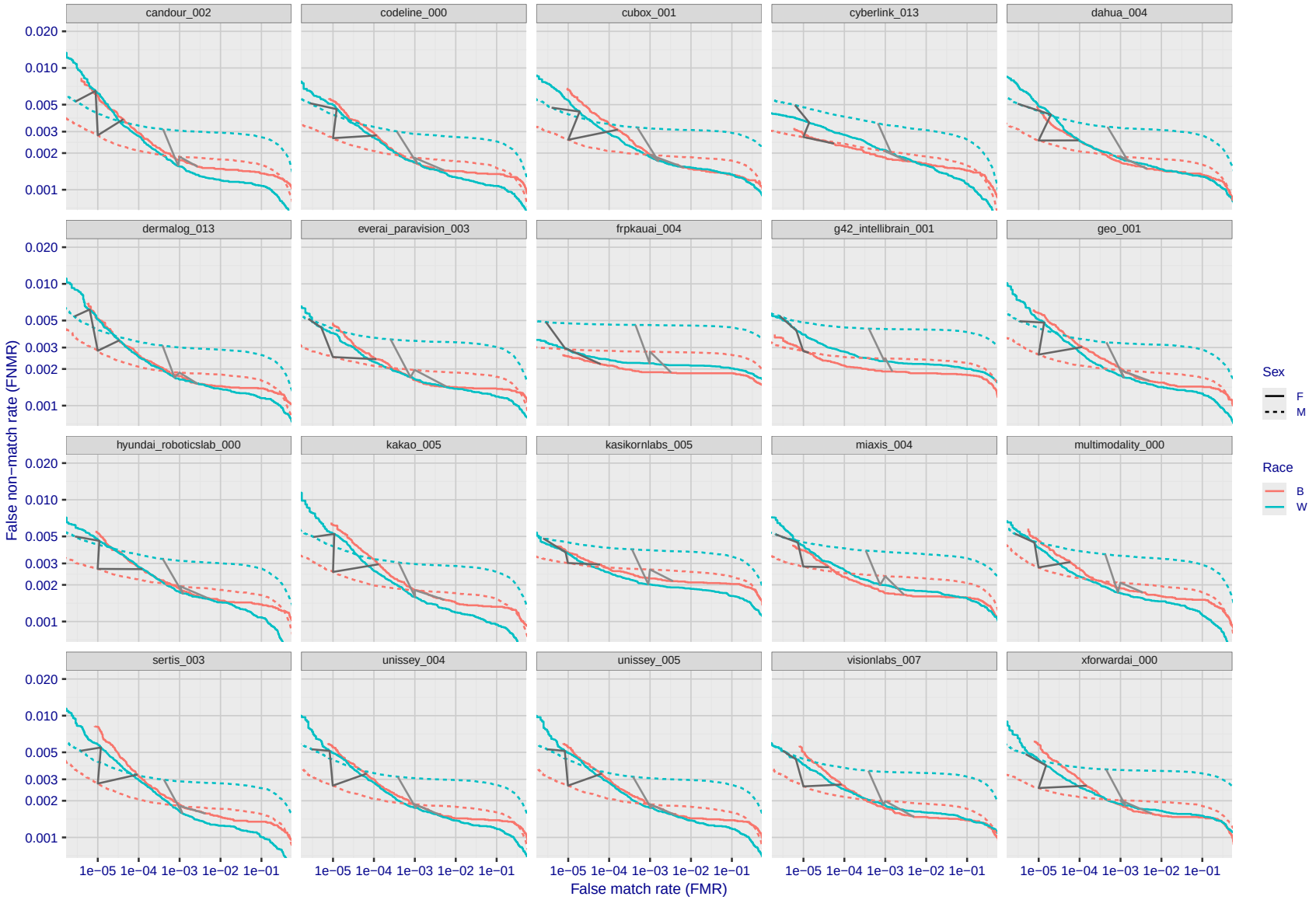

Figure 401: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

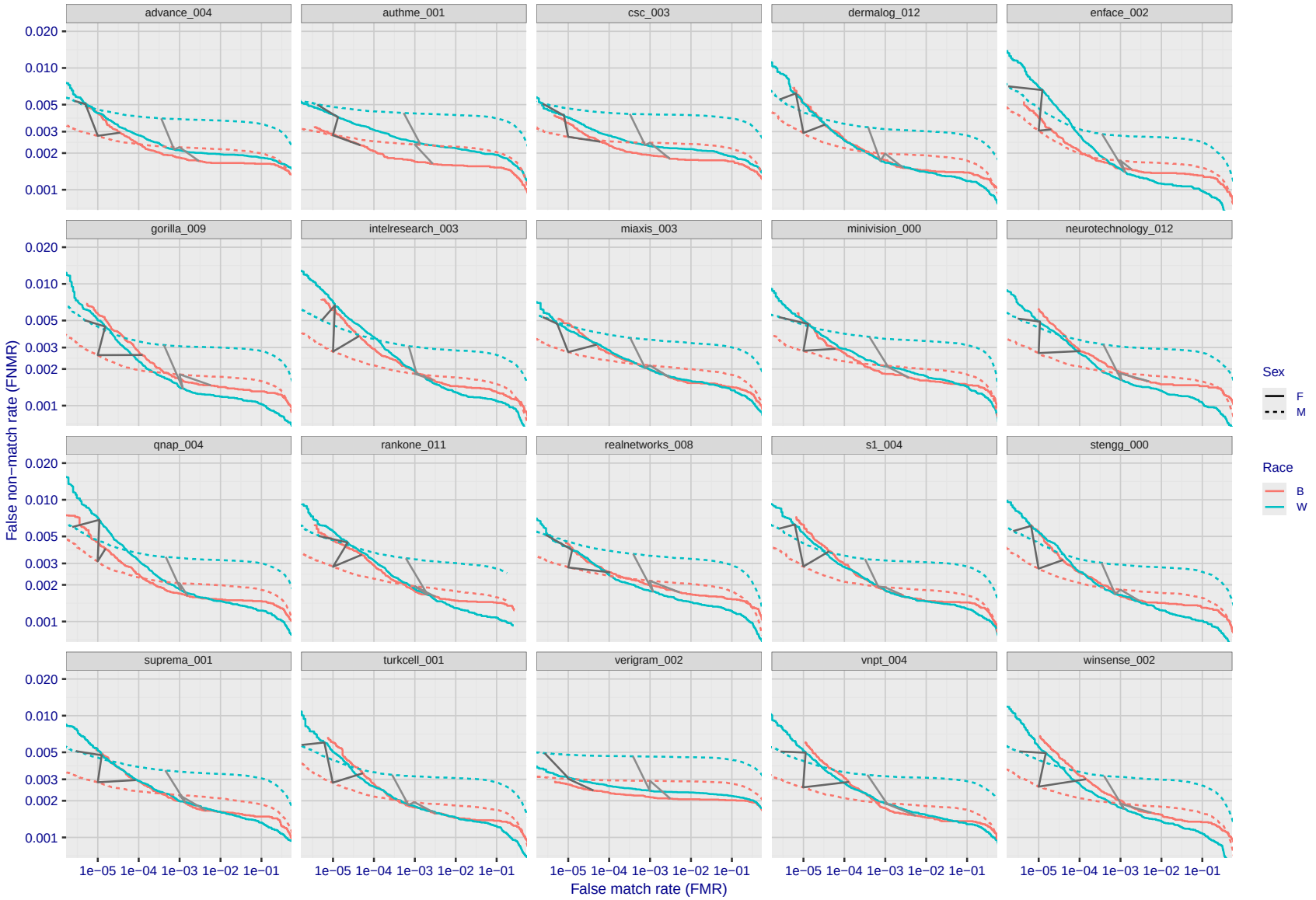

Figure 402: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

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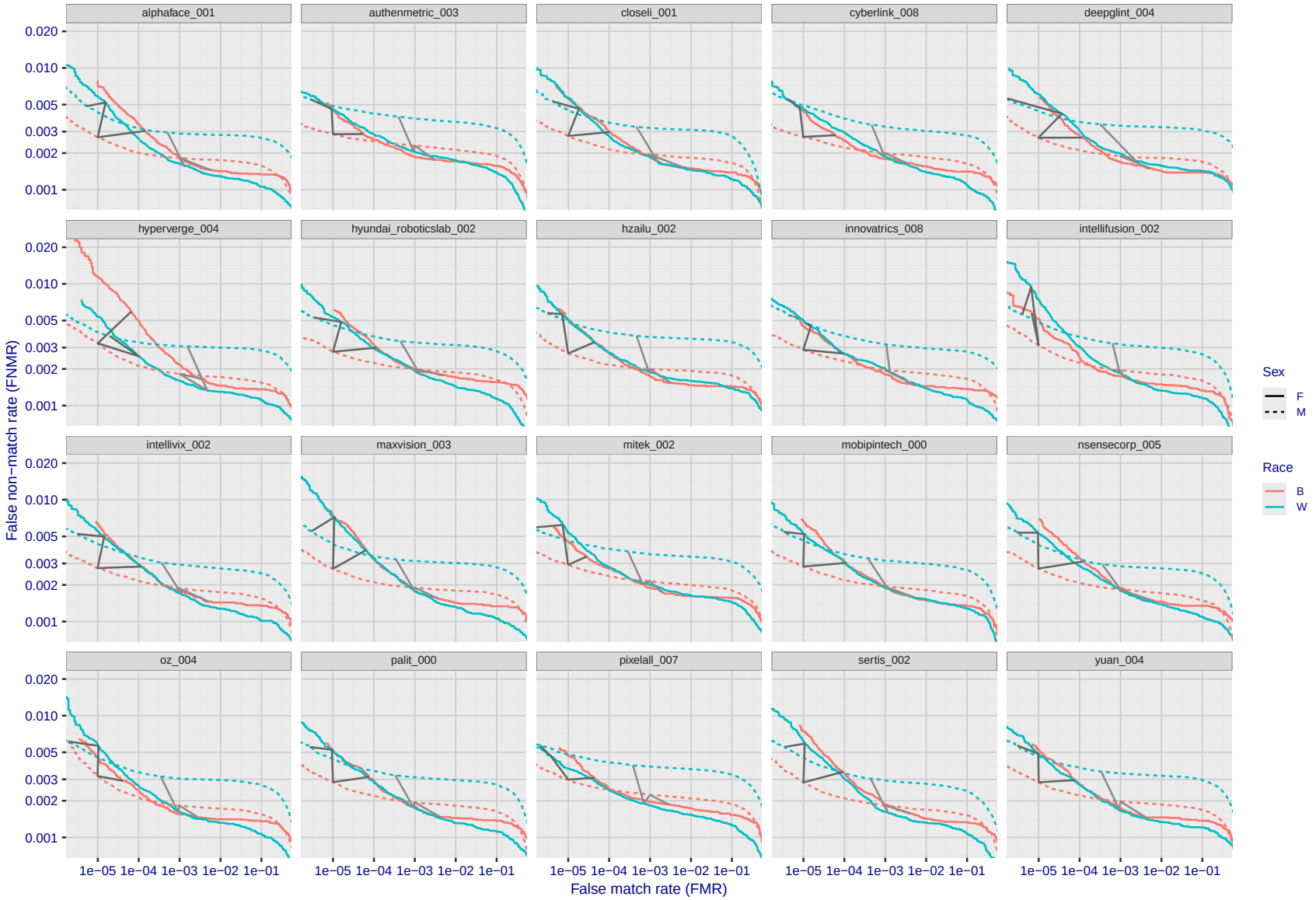

Figure 403: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

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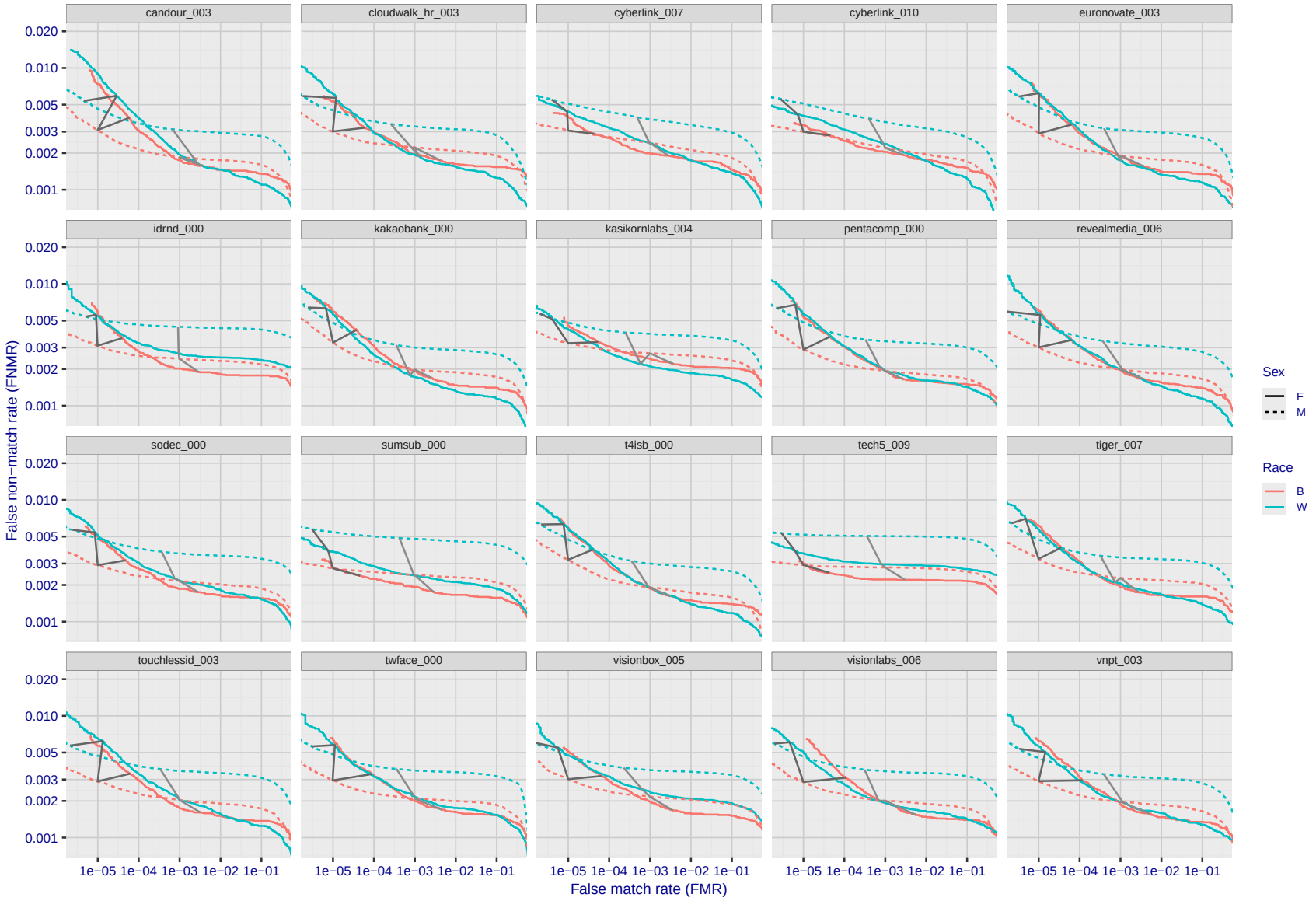


Figure 404: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

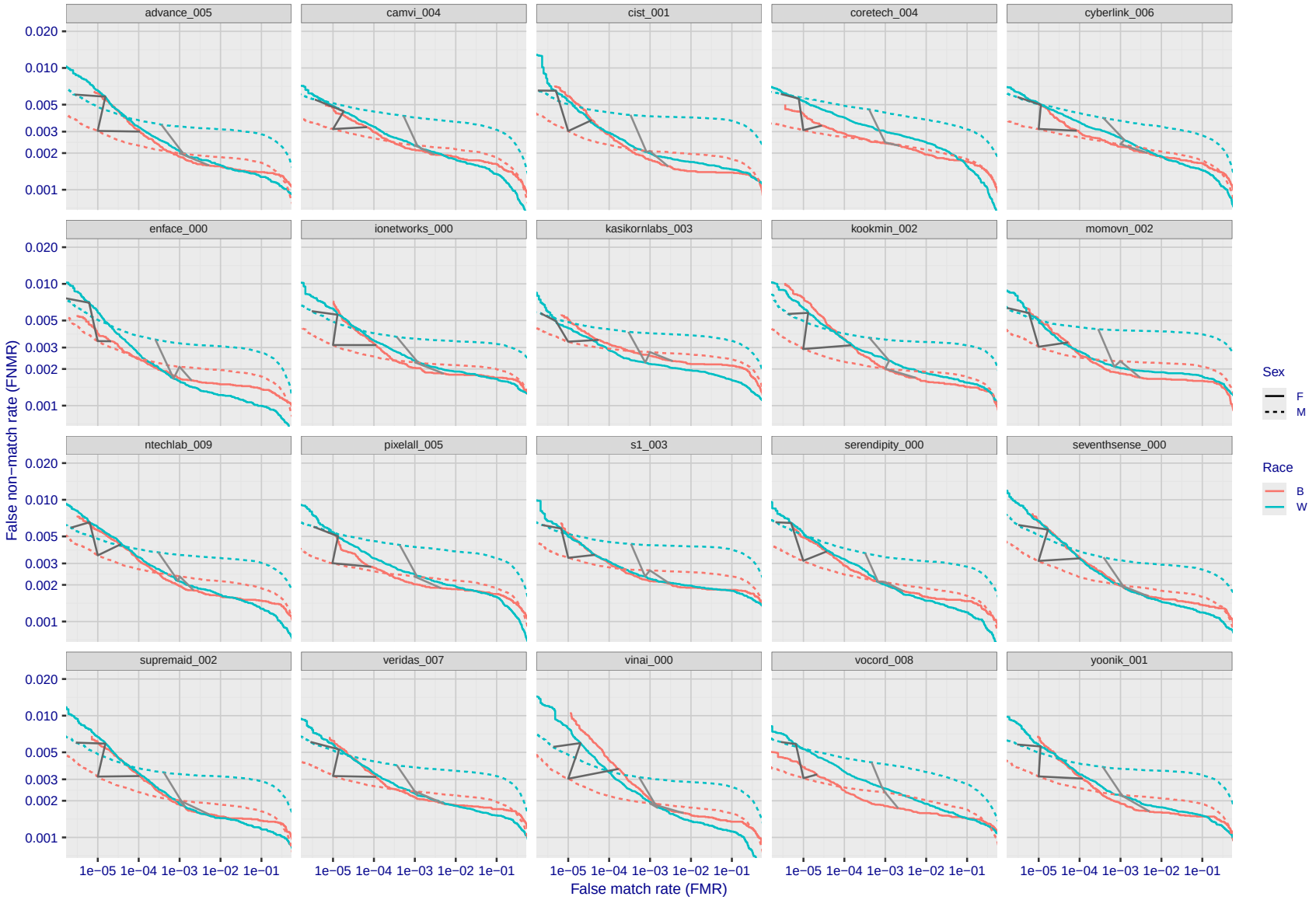
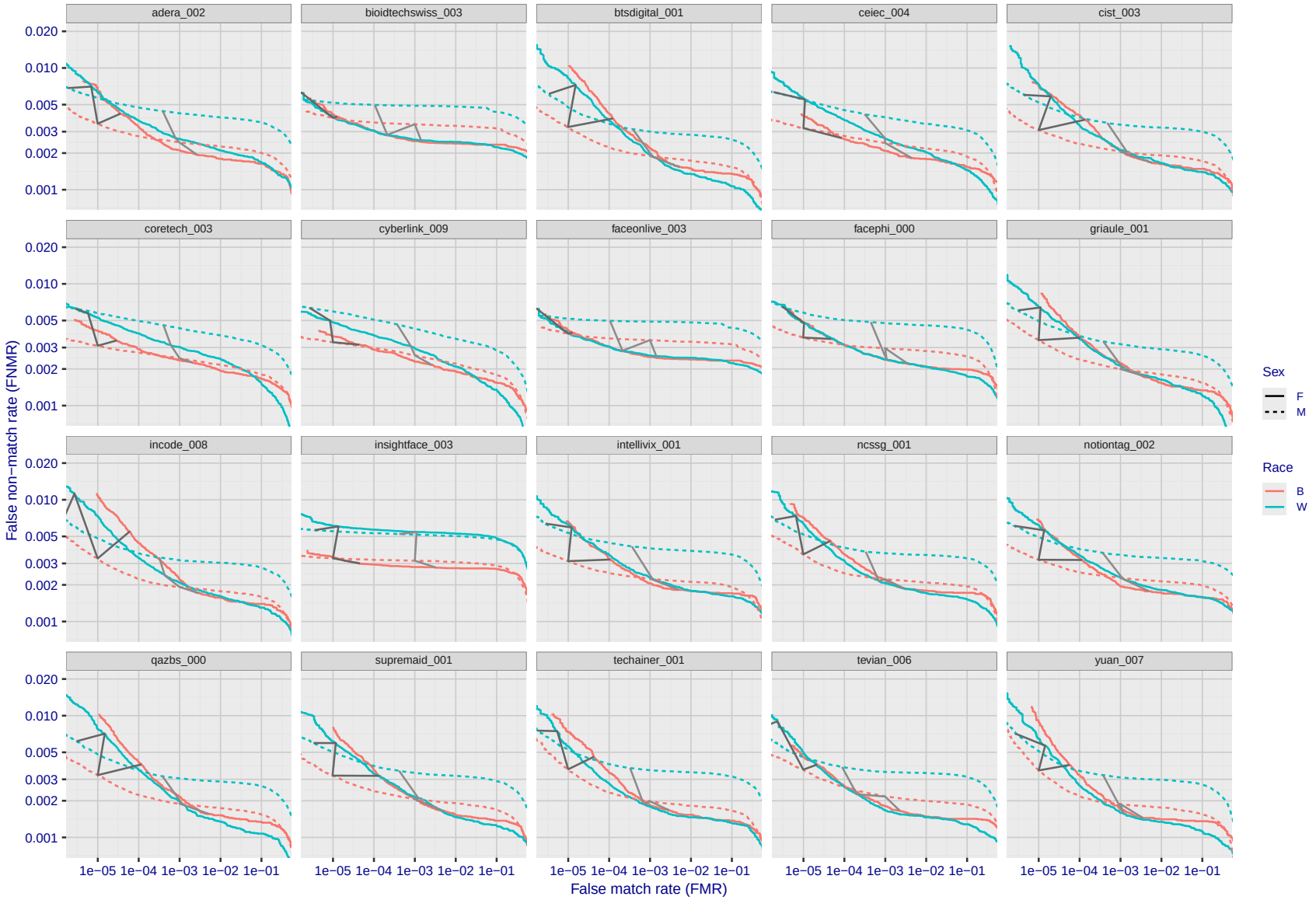


Figure 405: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*



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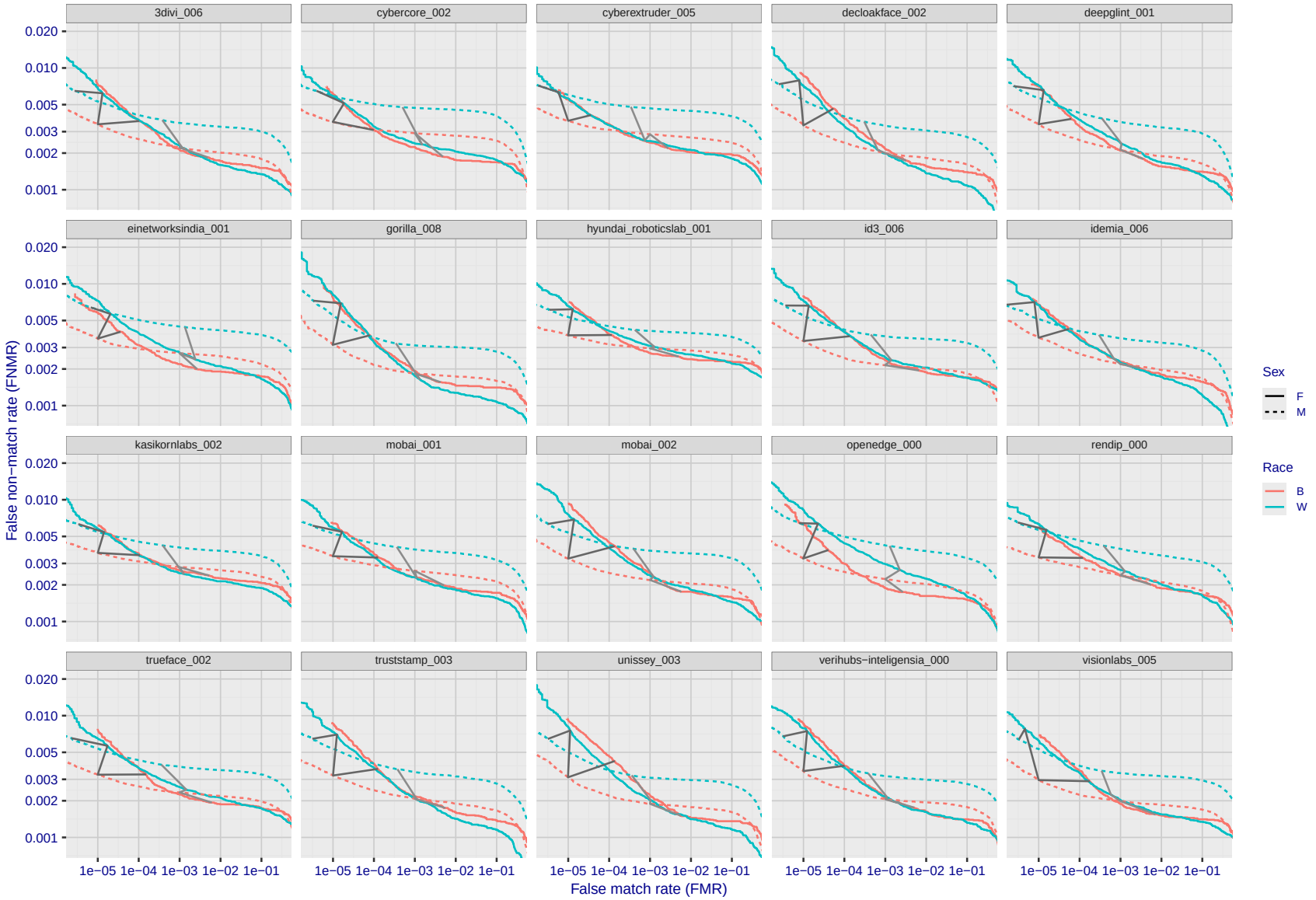

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

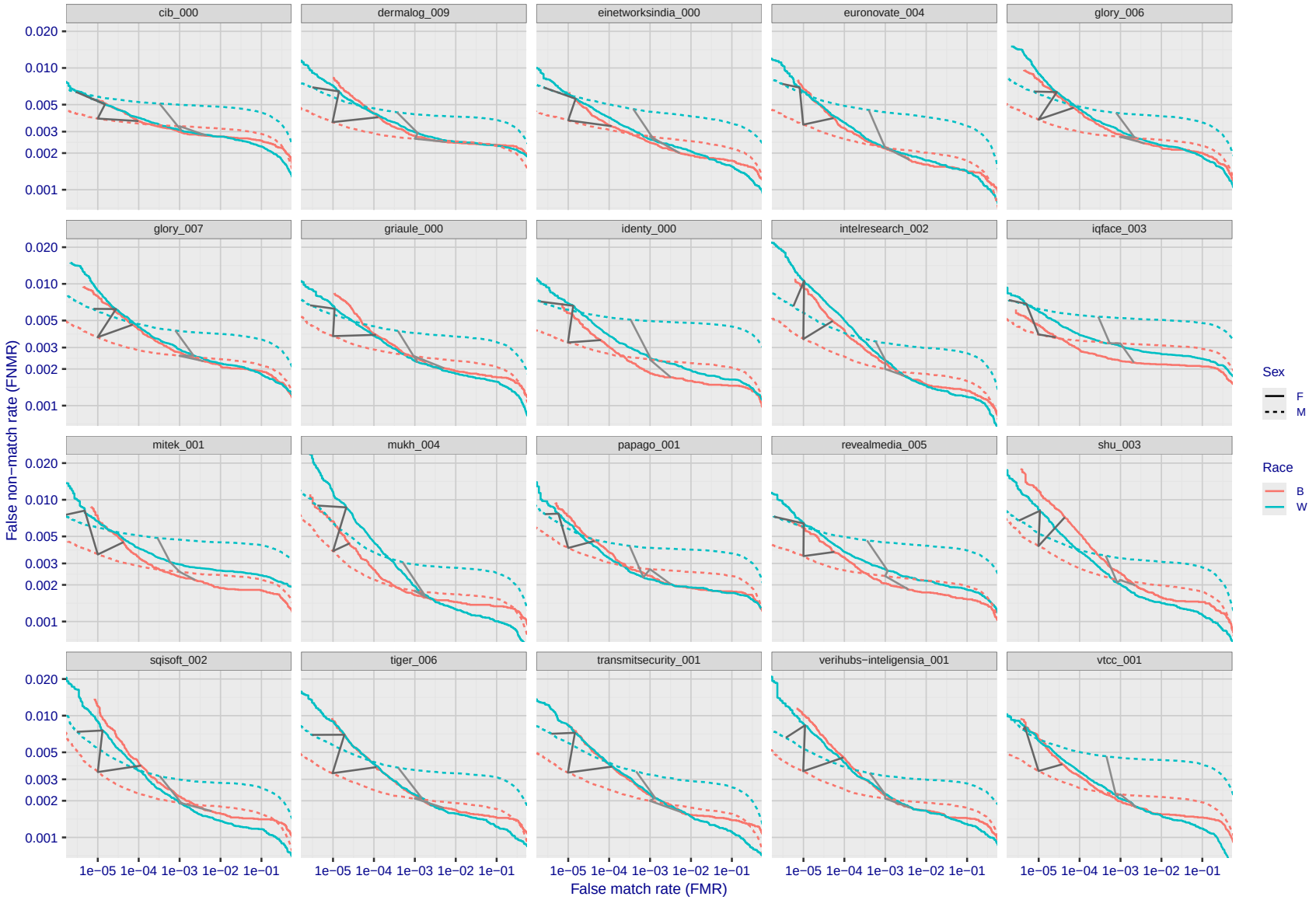

Figure 408: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

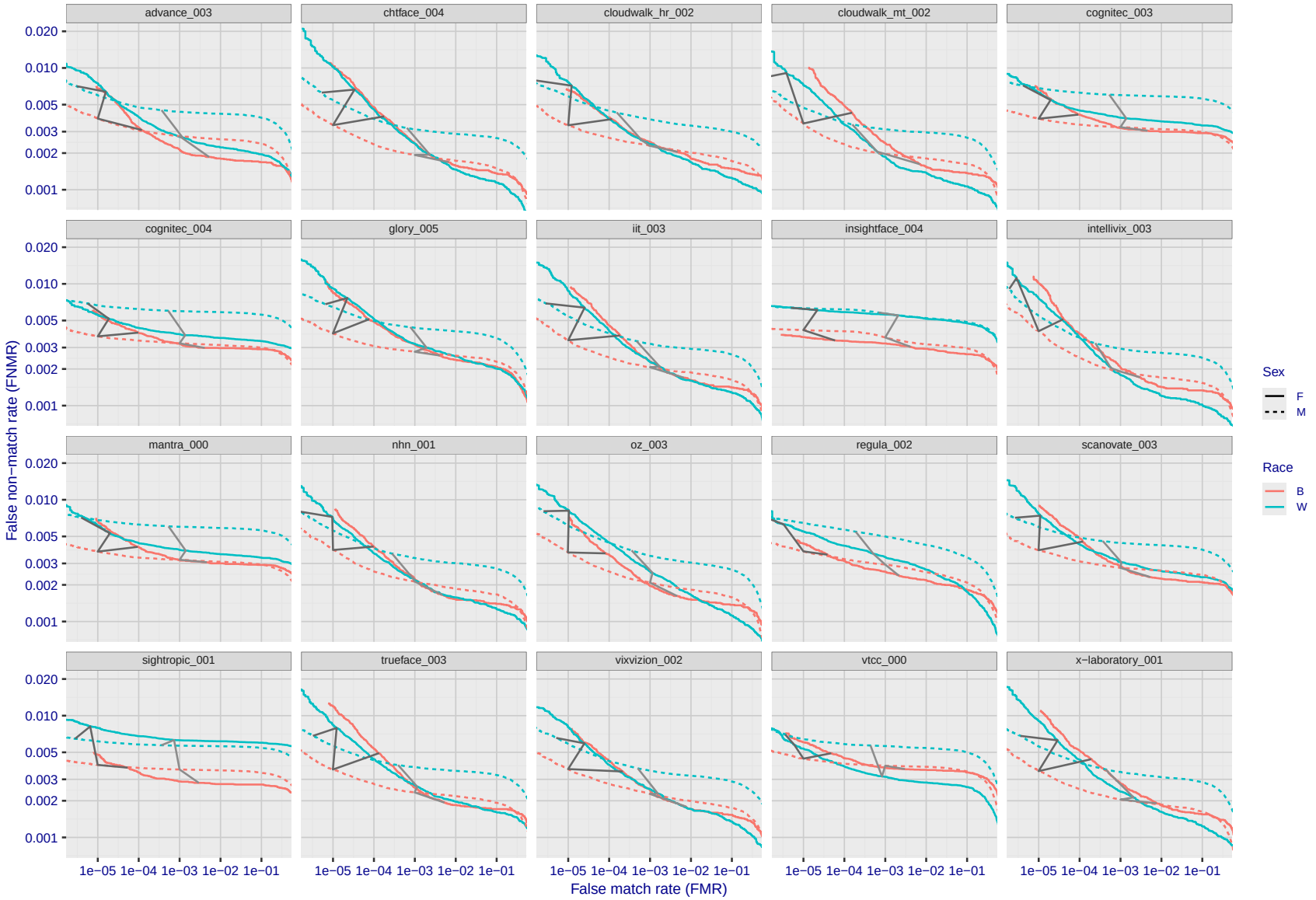

Figure 409: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

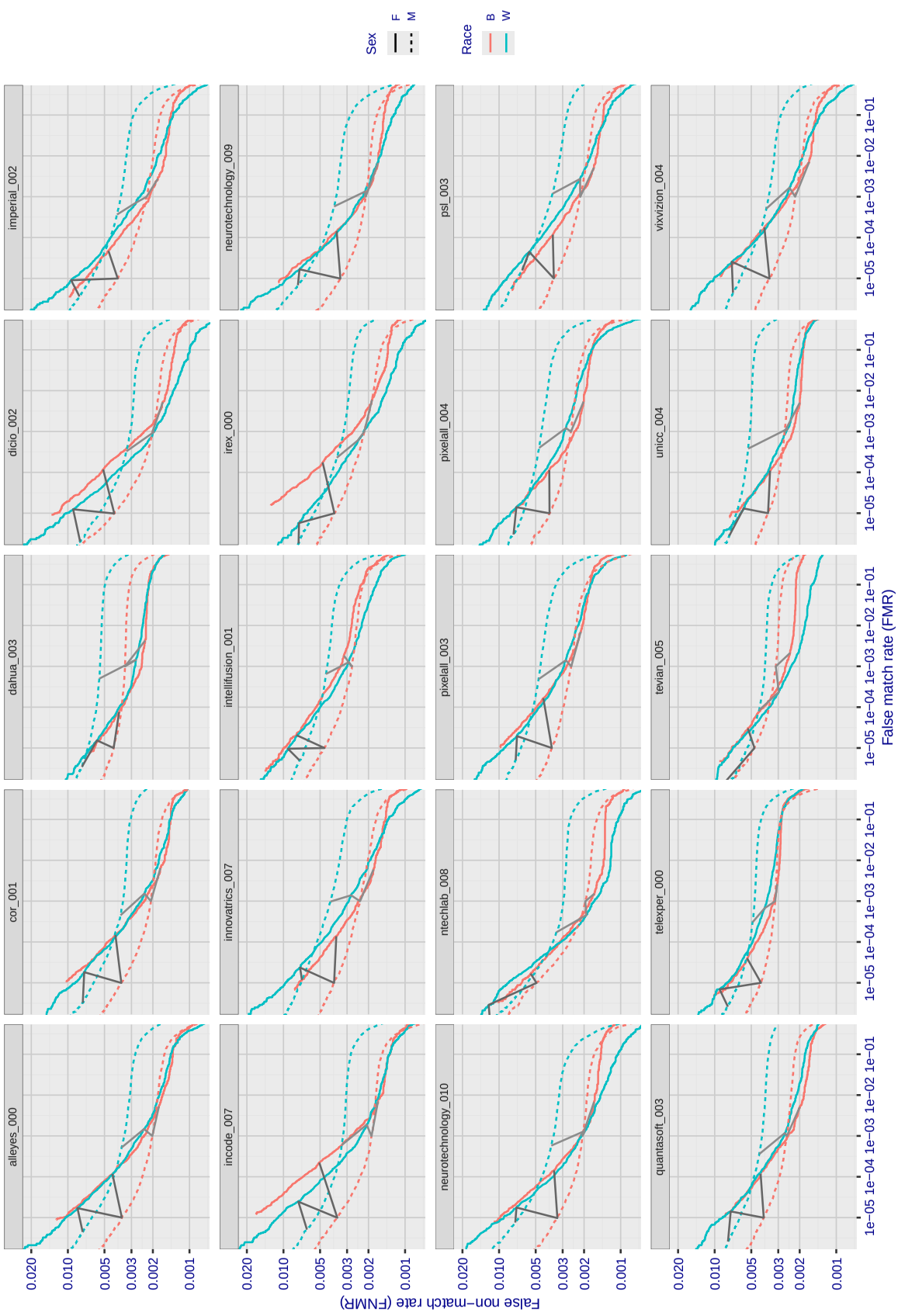

Figure 410: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women at a fixed threshold* but, *at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

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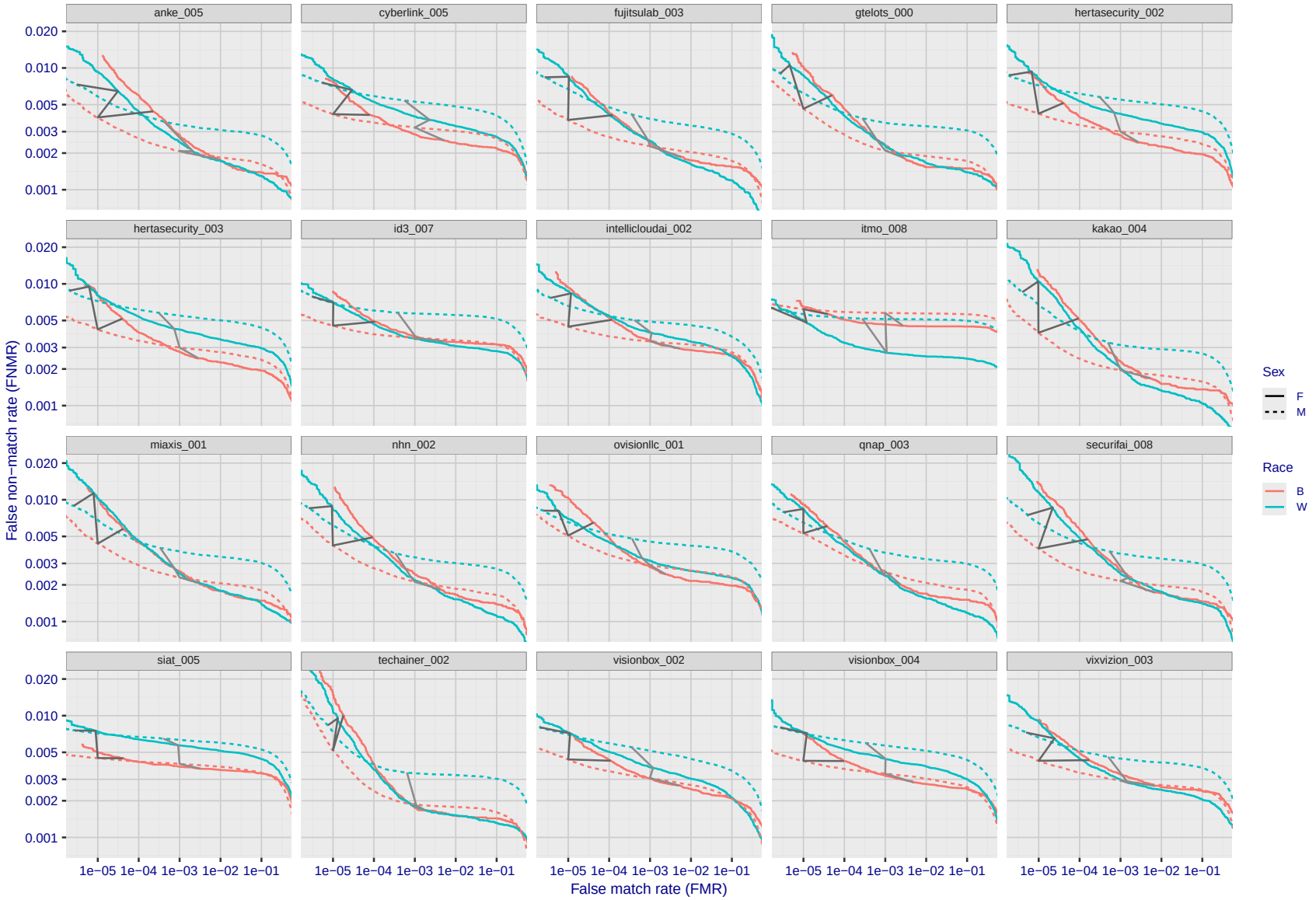


Figure 411: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

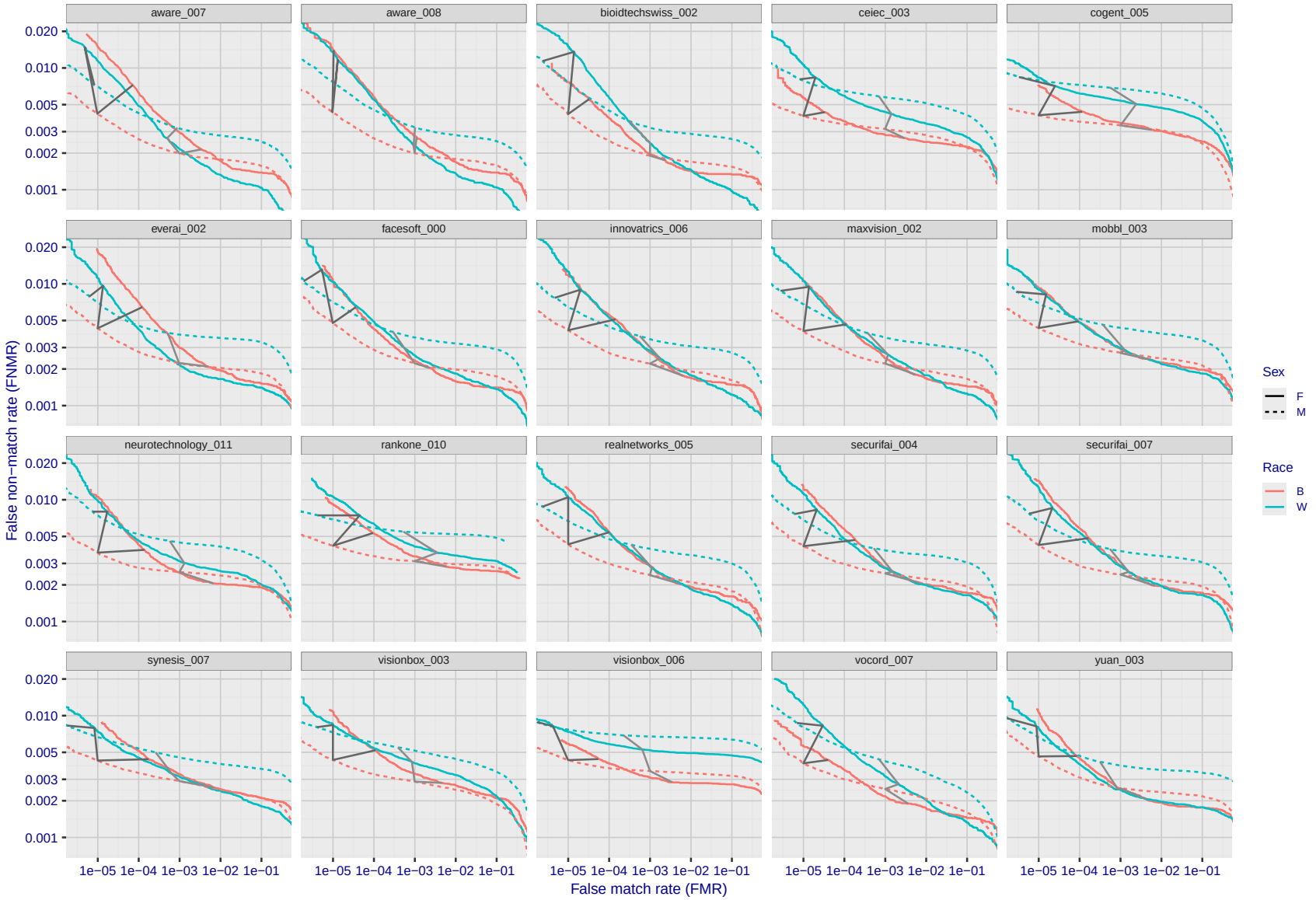


Figure 412: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

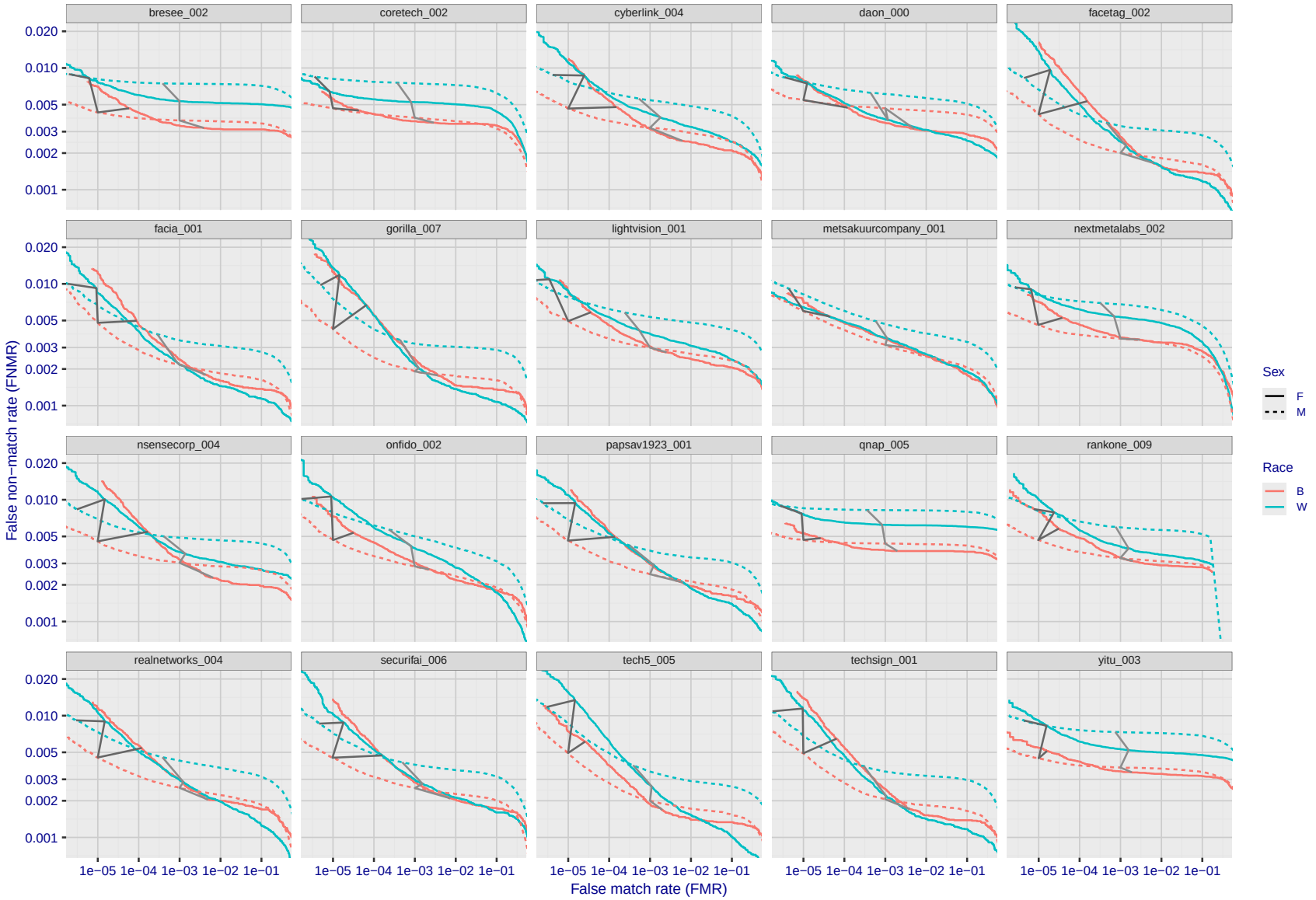


Figure 413: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

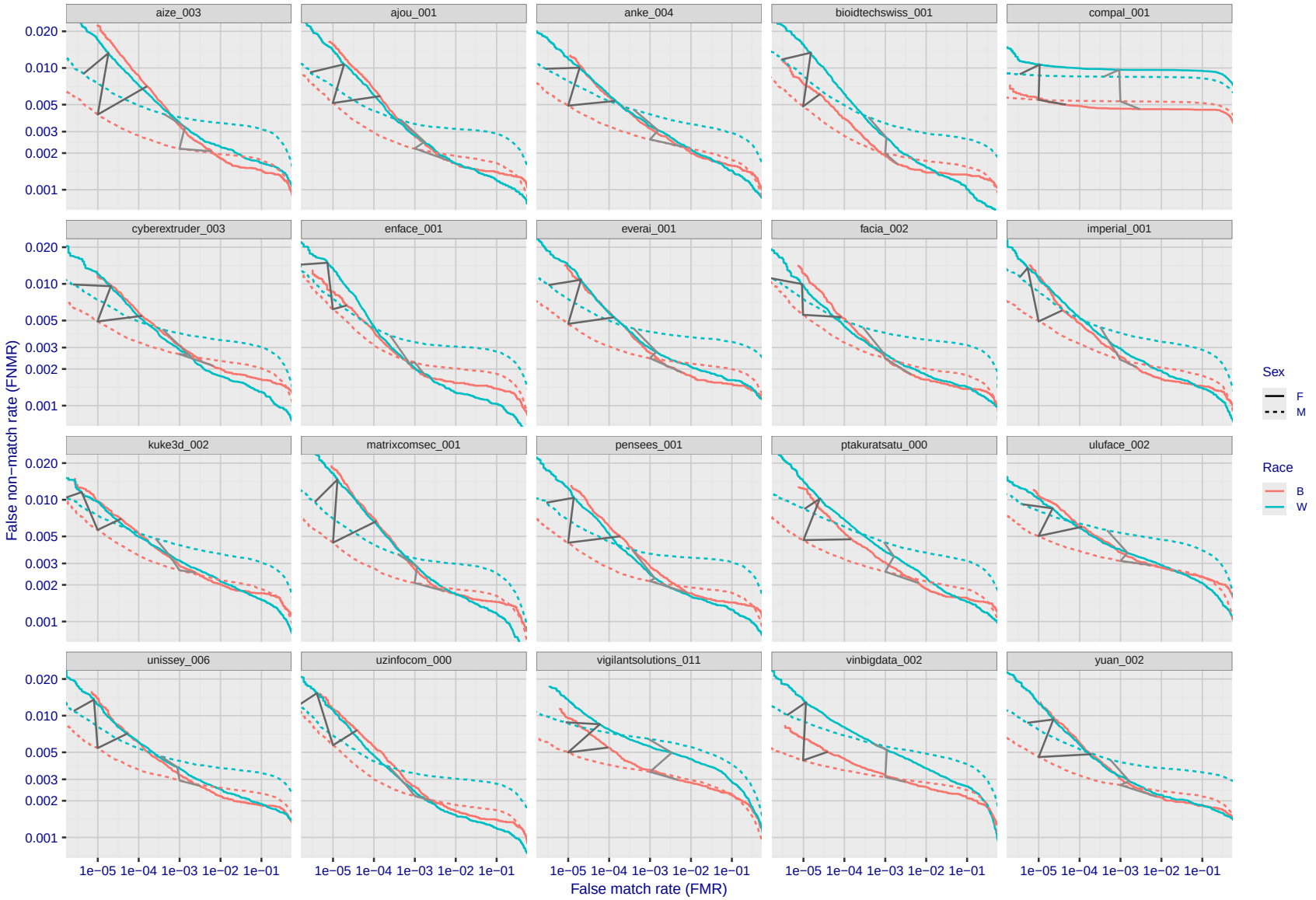
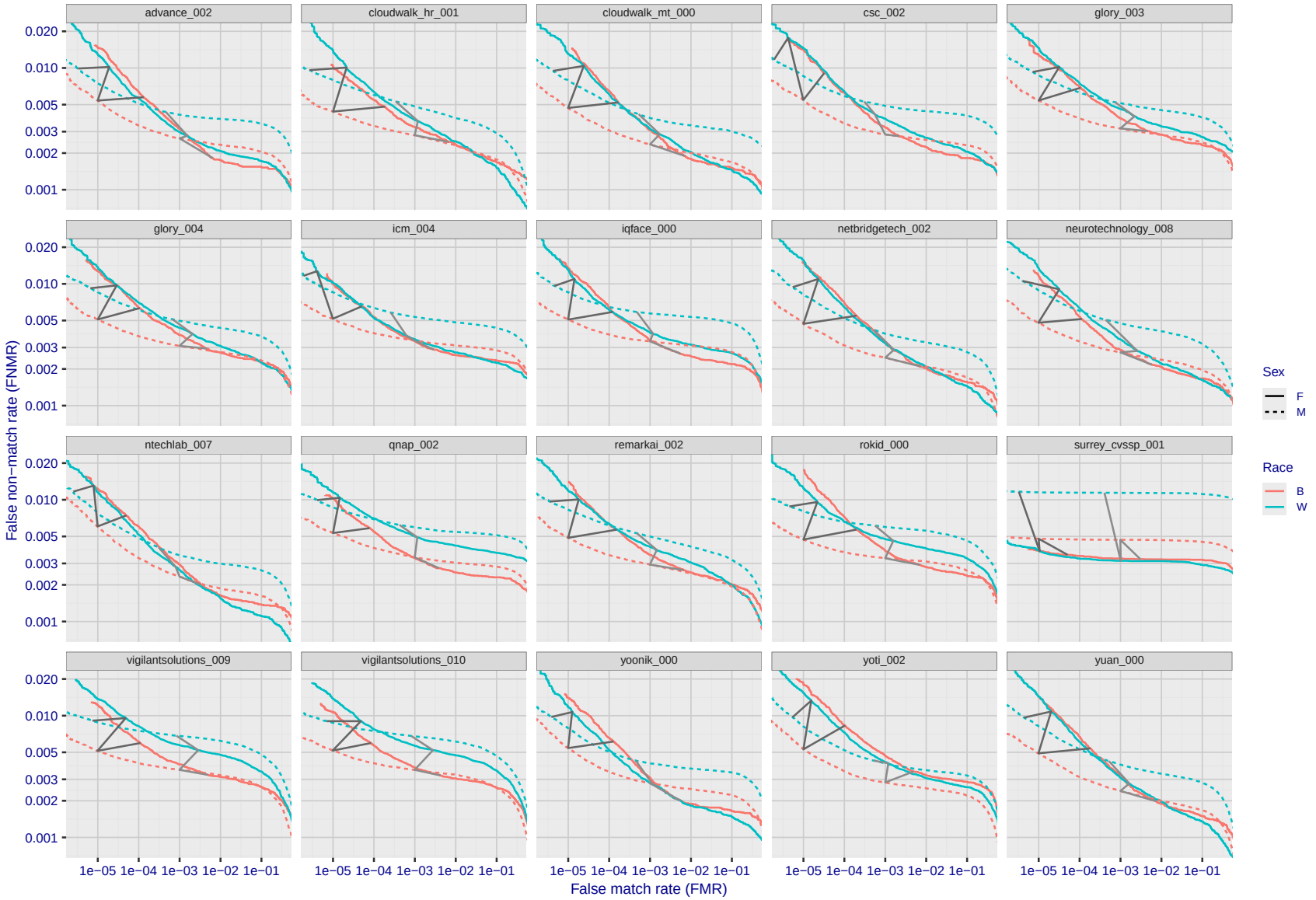


Figure 414: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*



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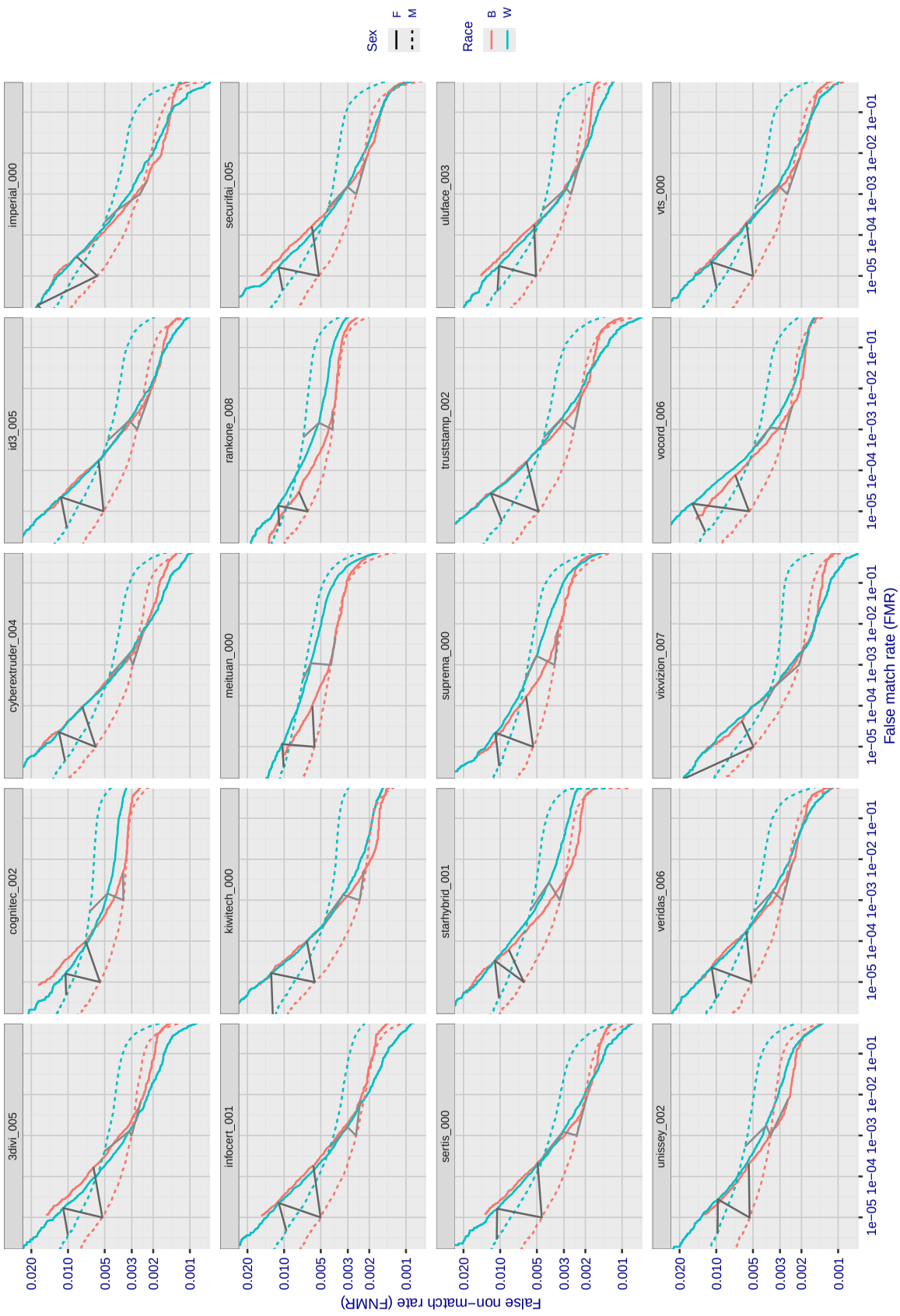

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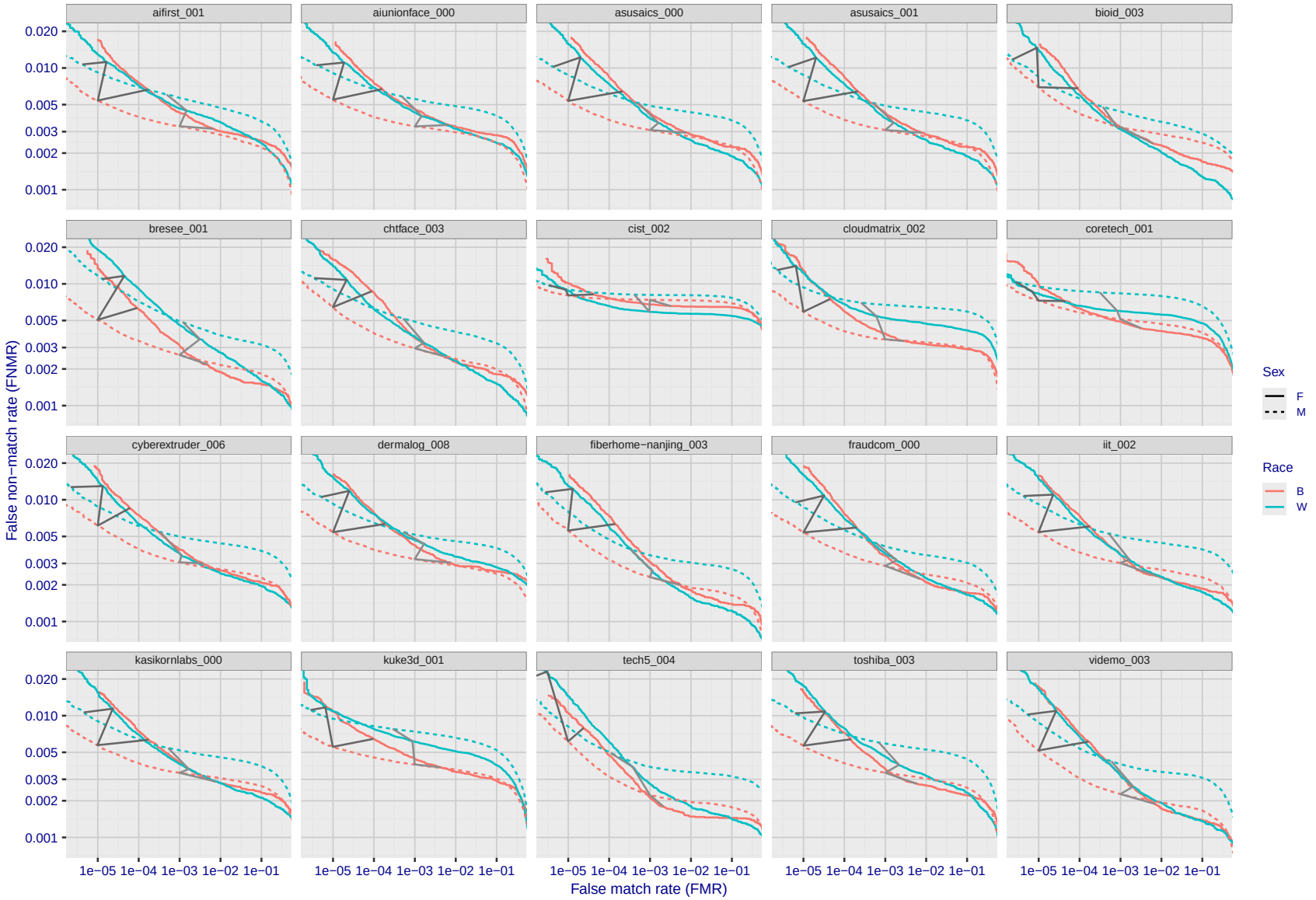
FNMR(T) "False non-match rate"
FMR(T) "False match rate"



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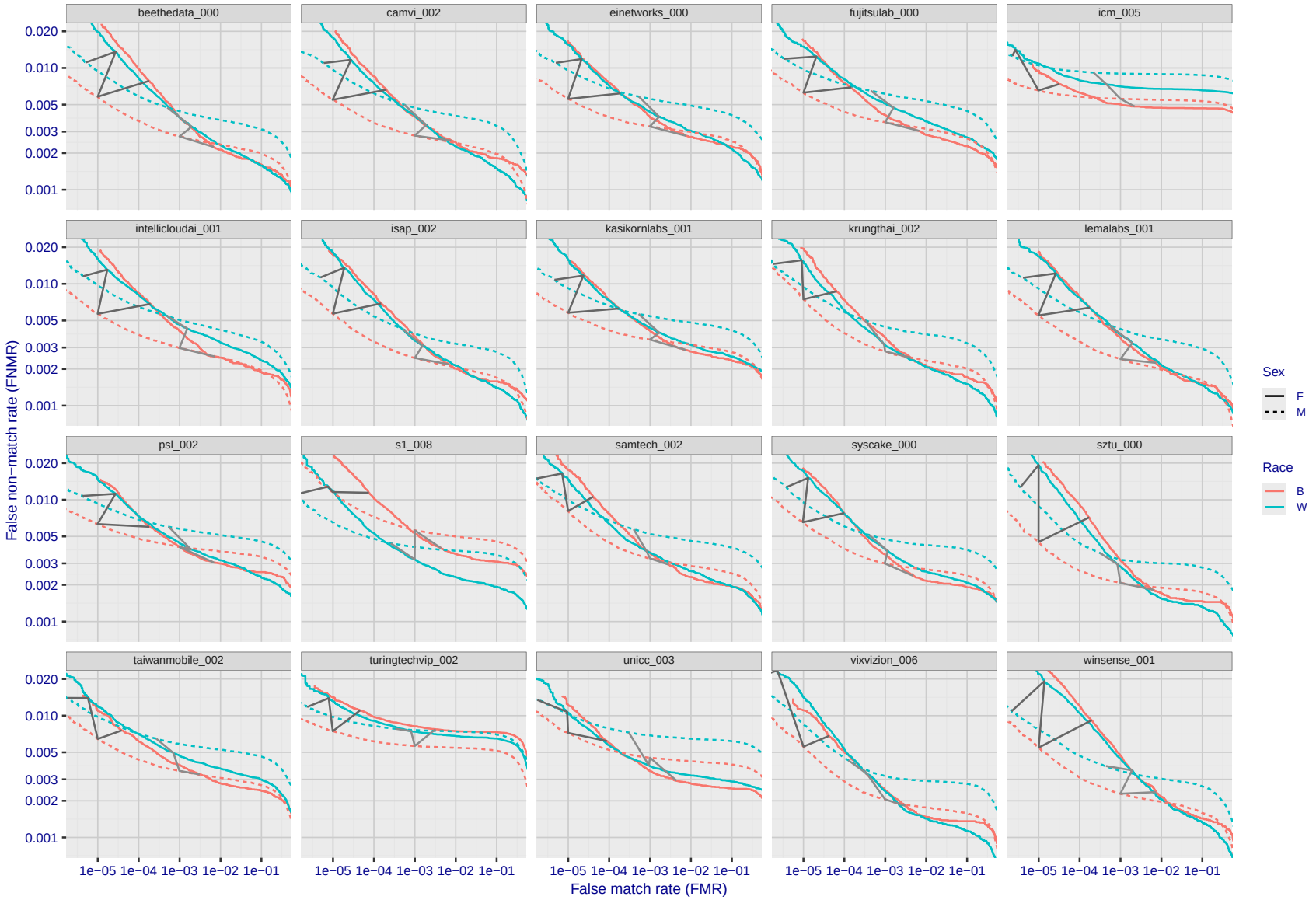

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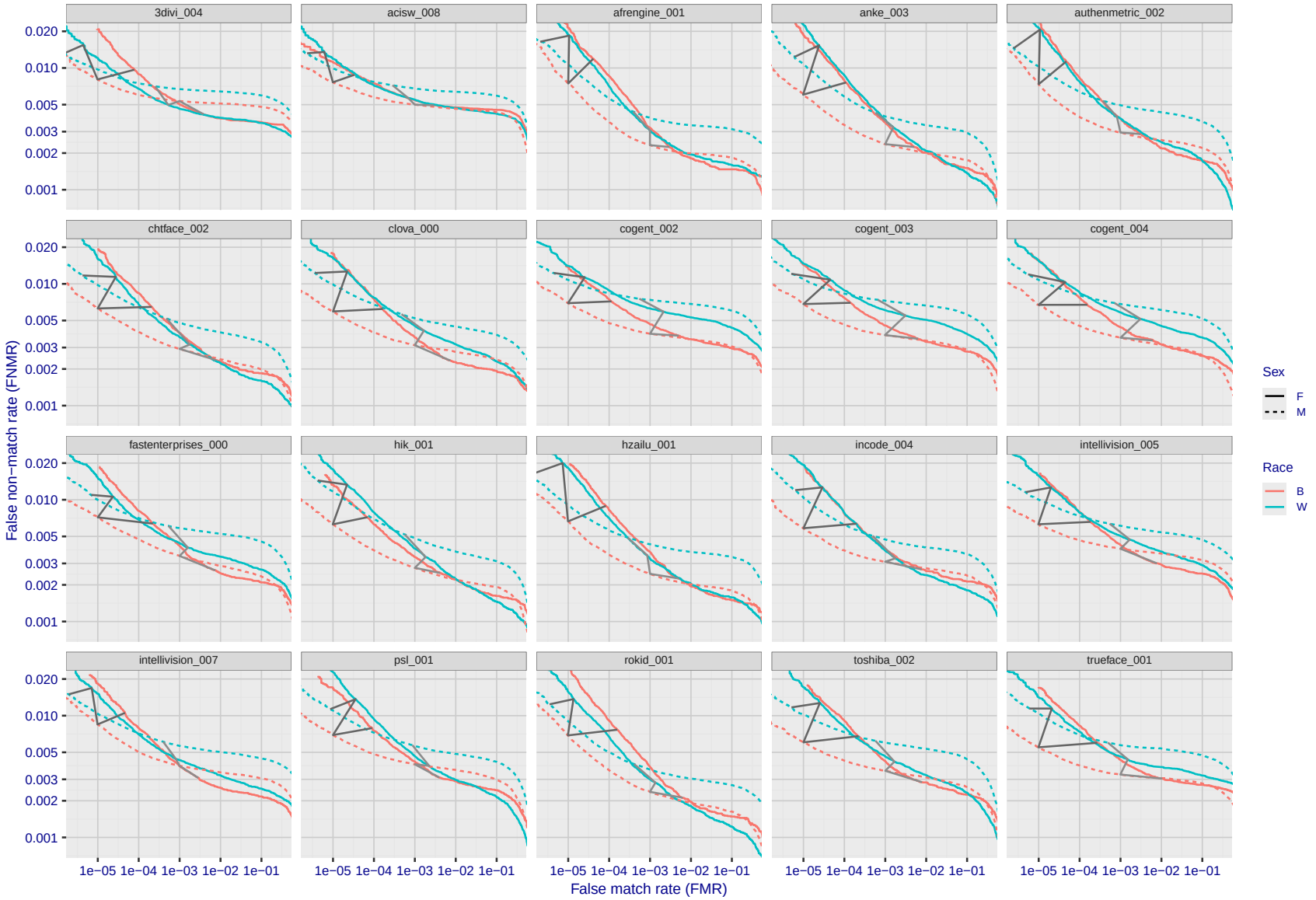

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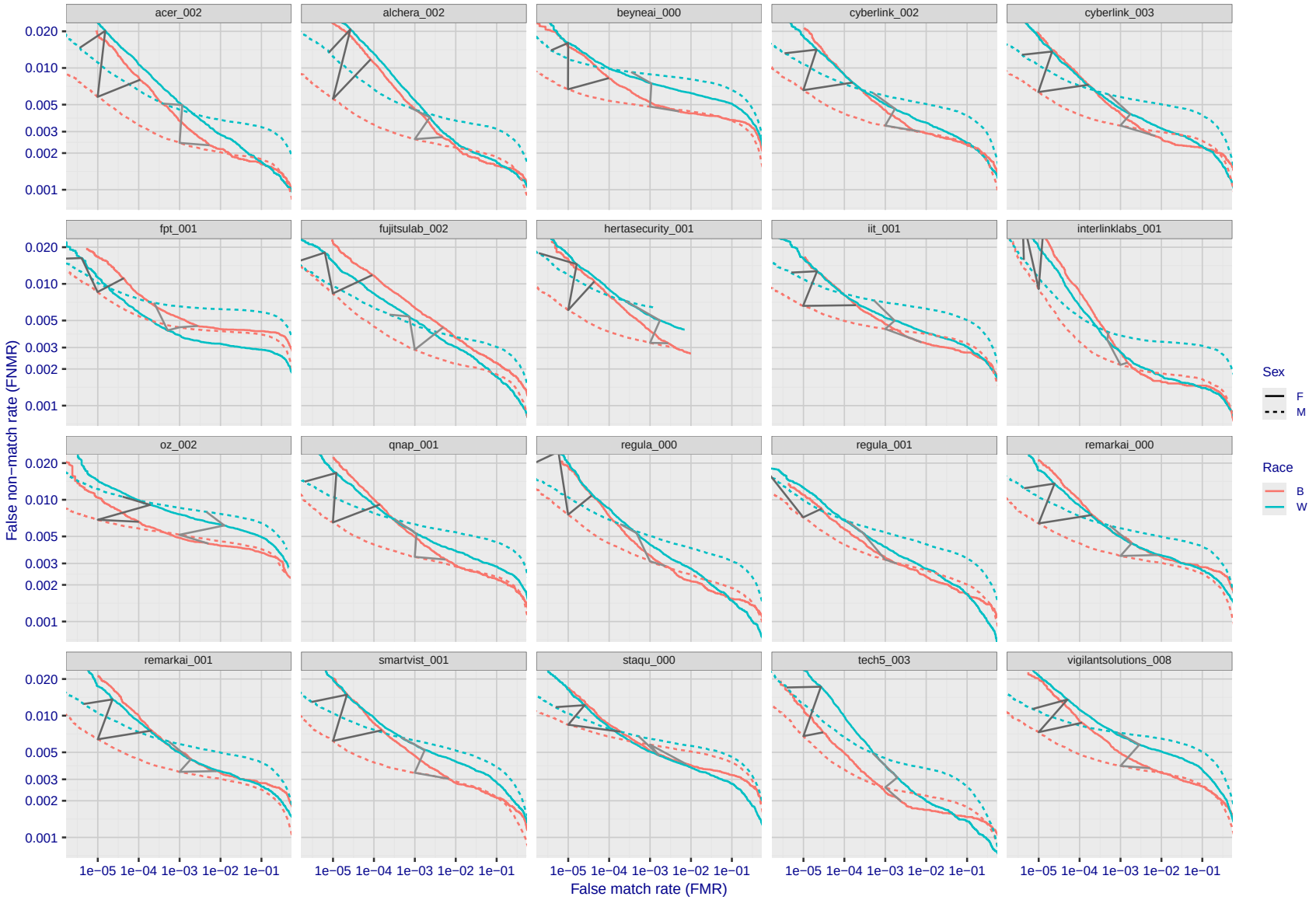

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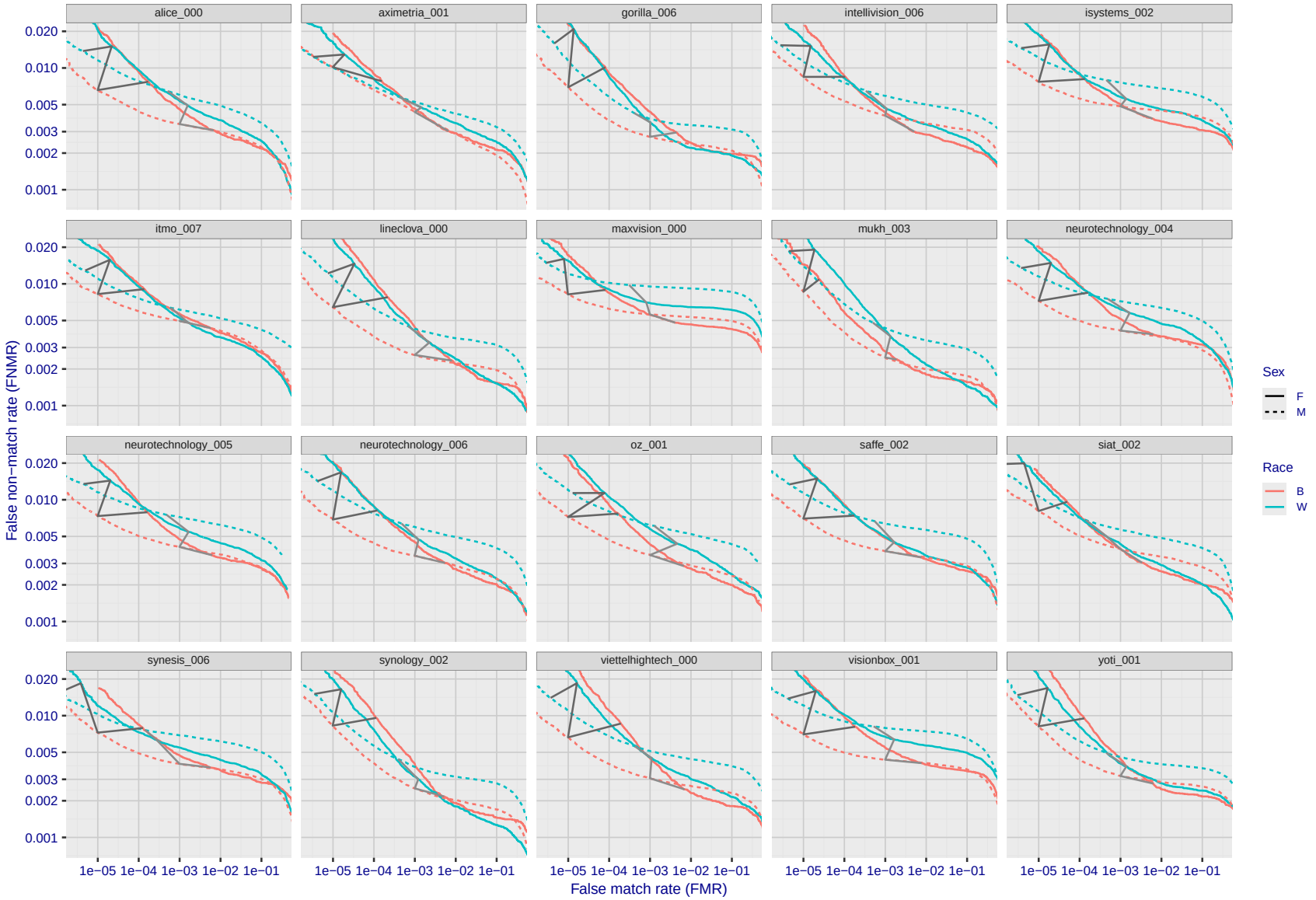

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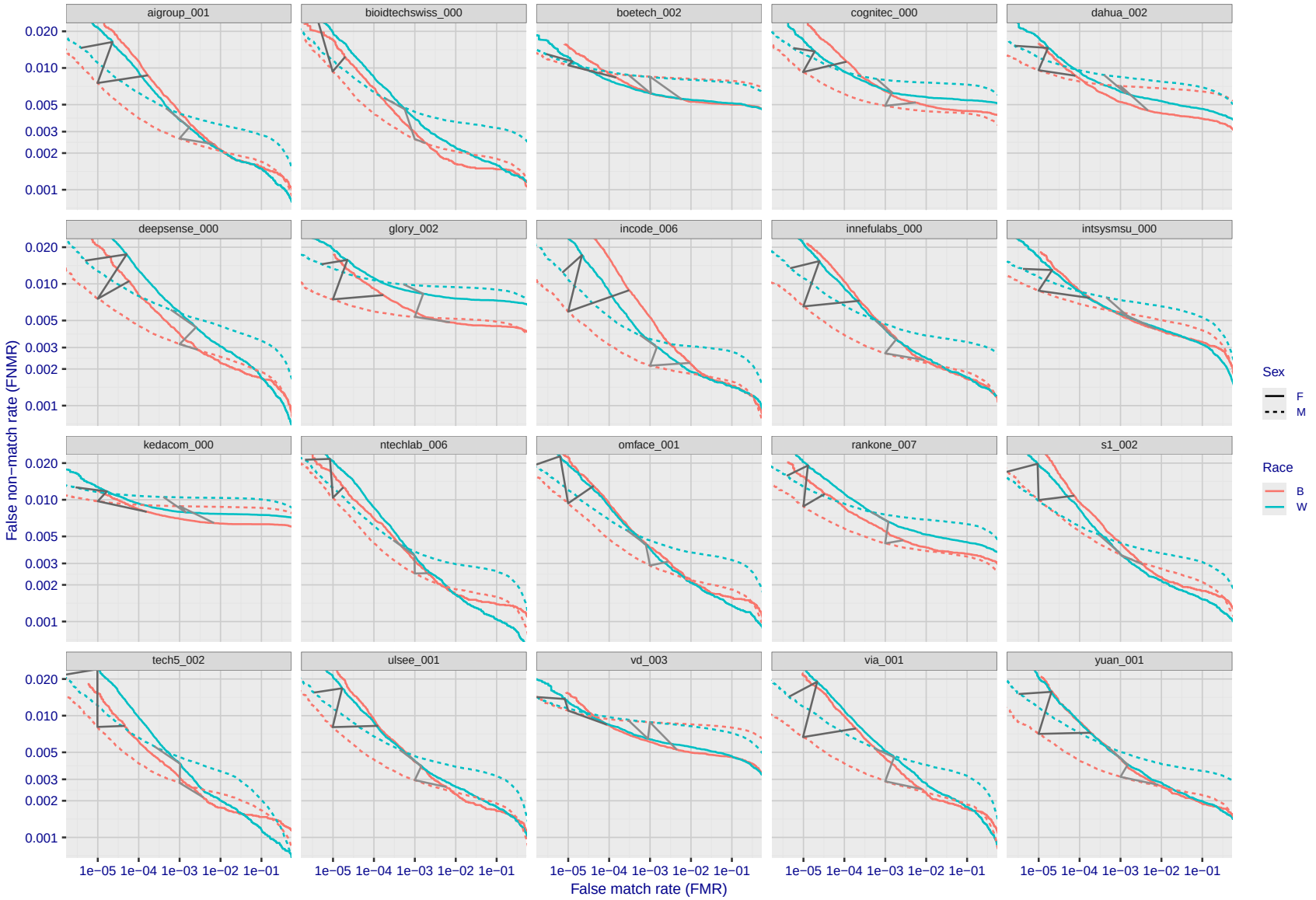

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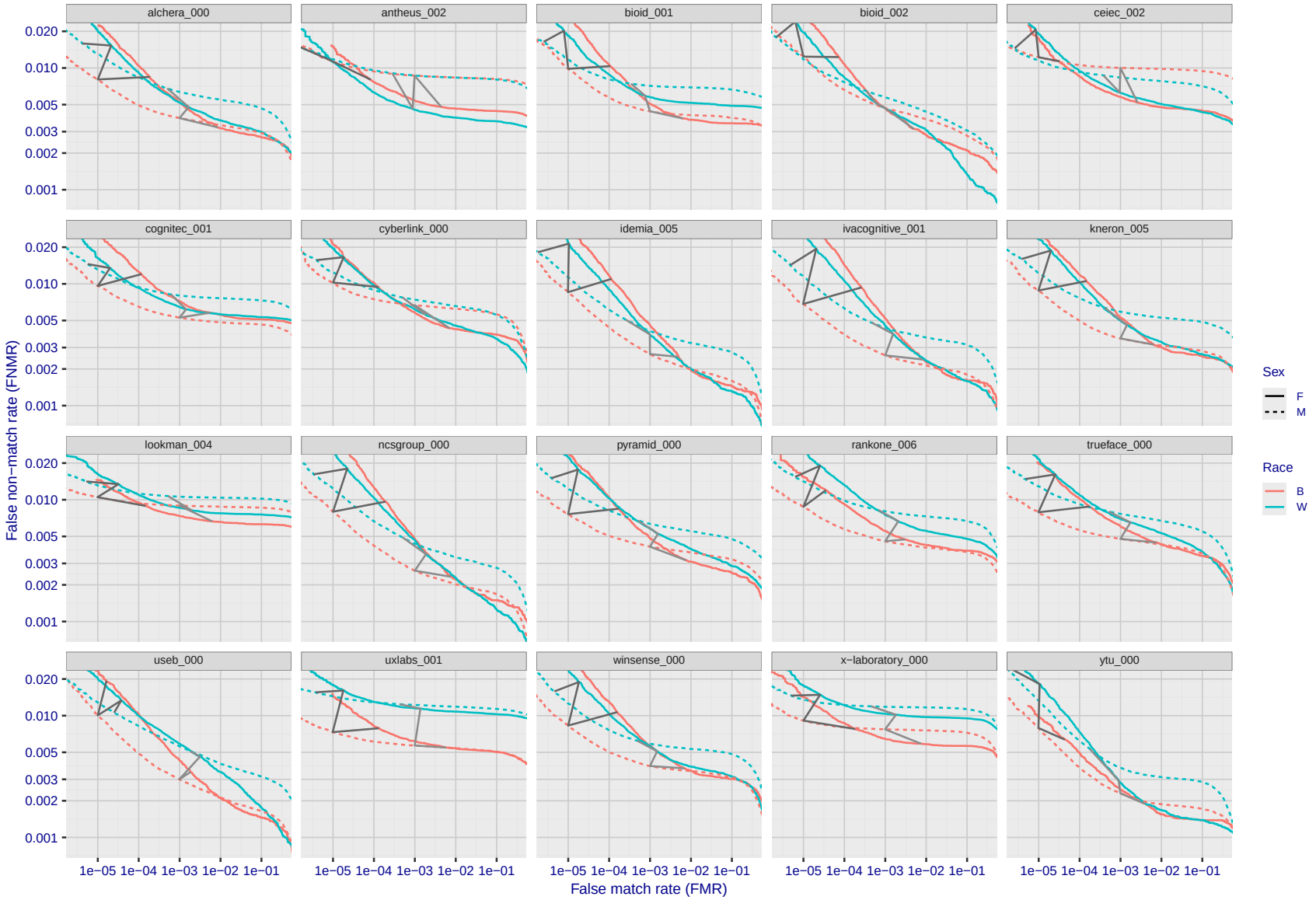

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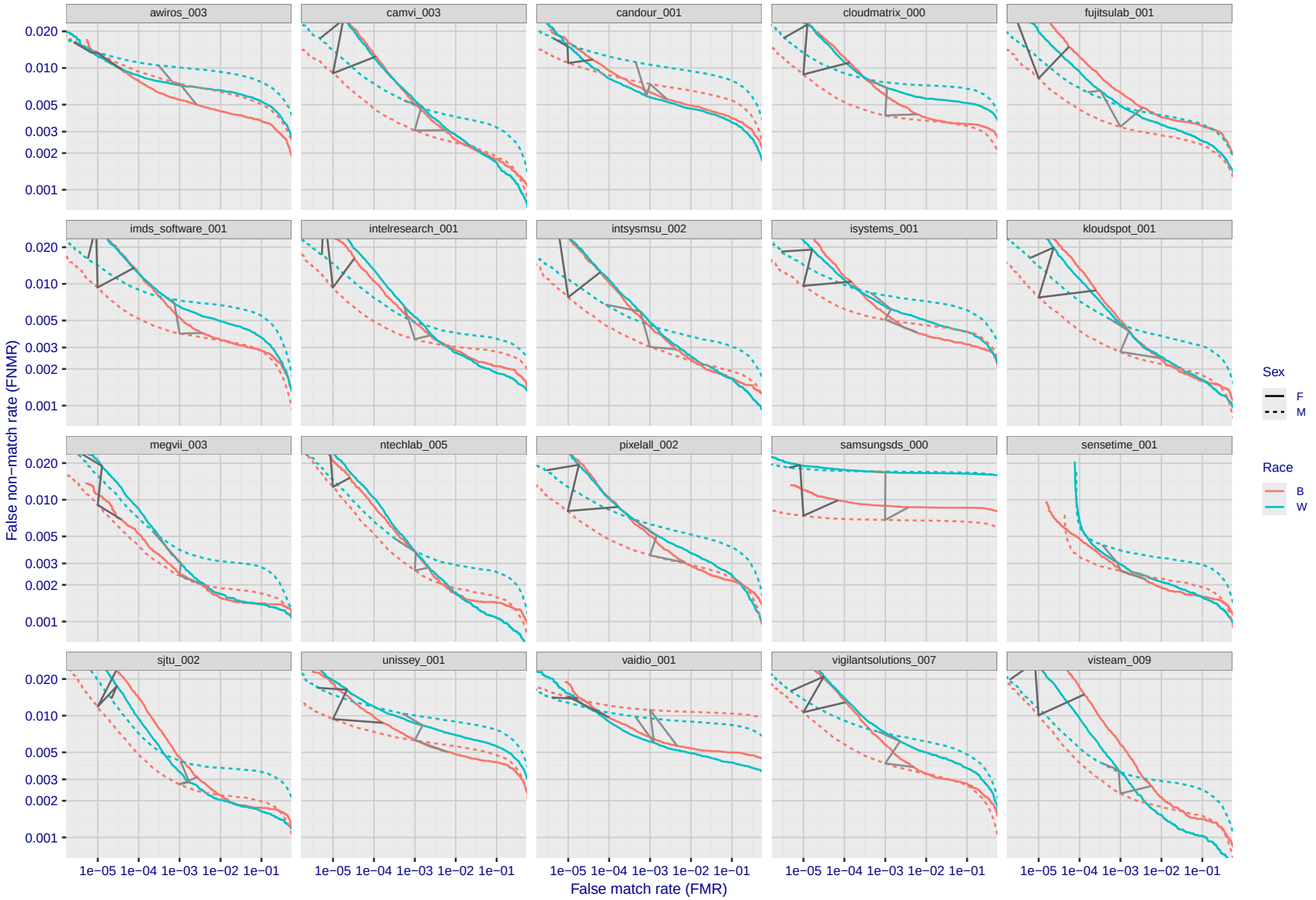

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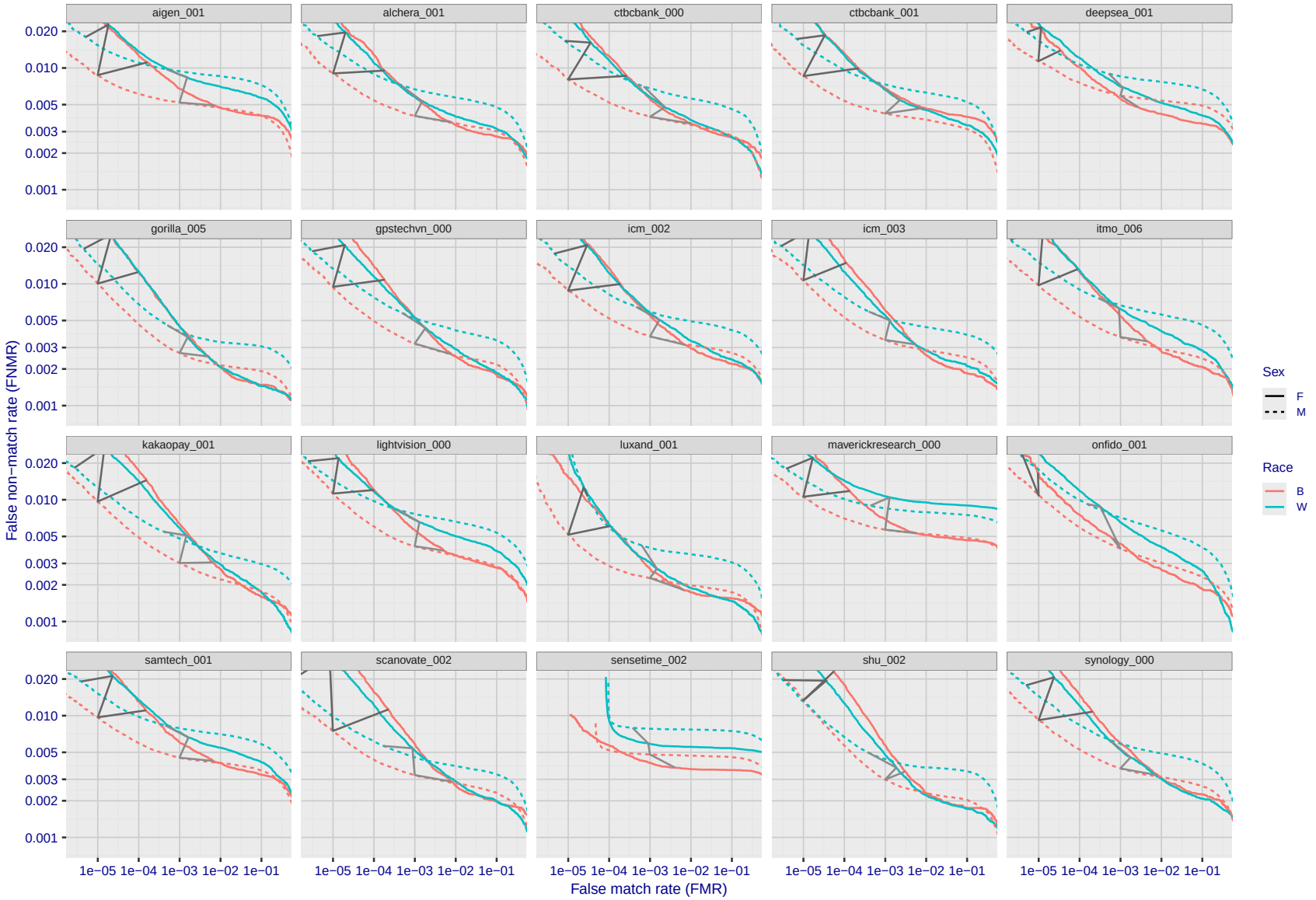
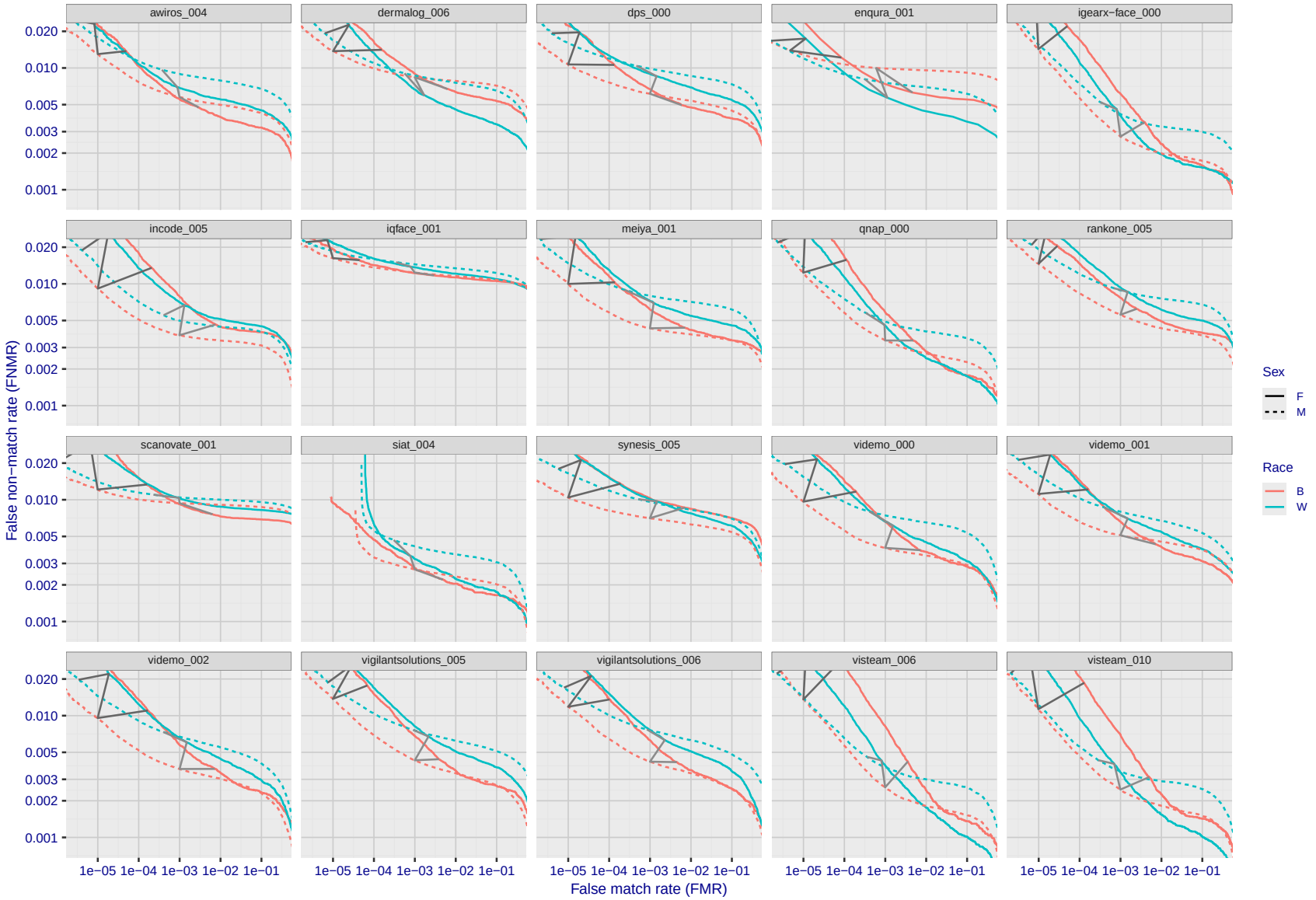


Figure 425: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*



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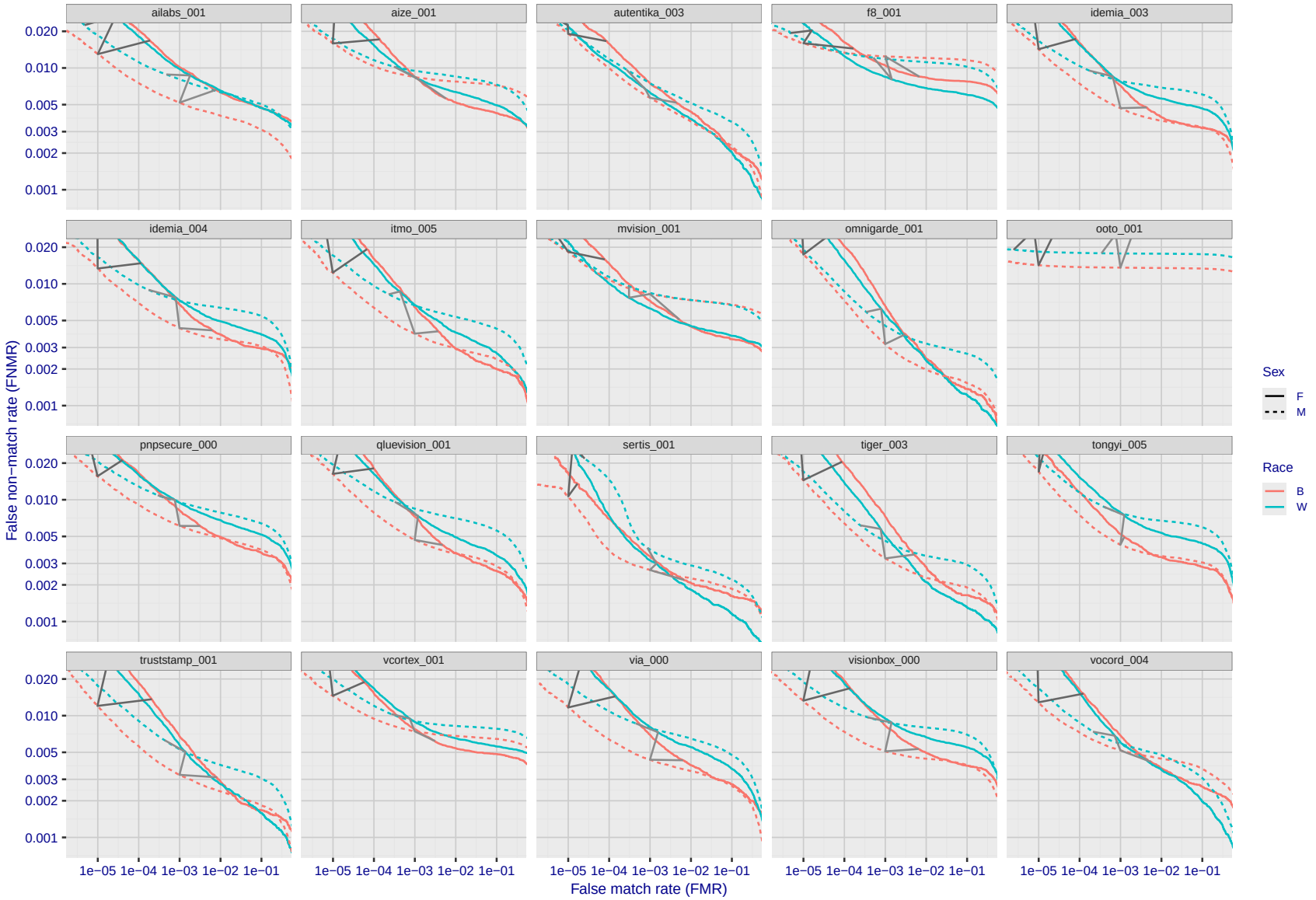

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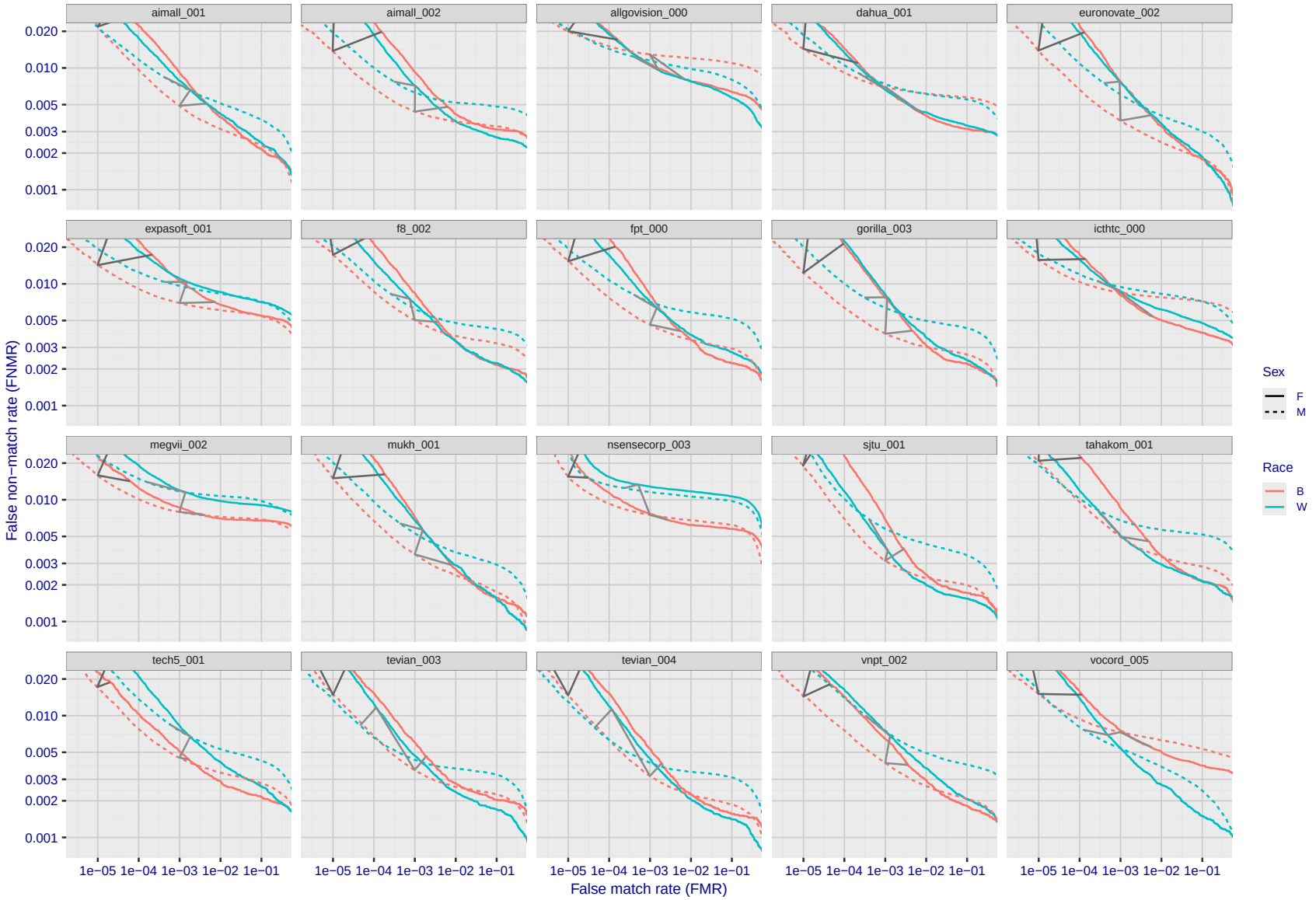

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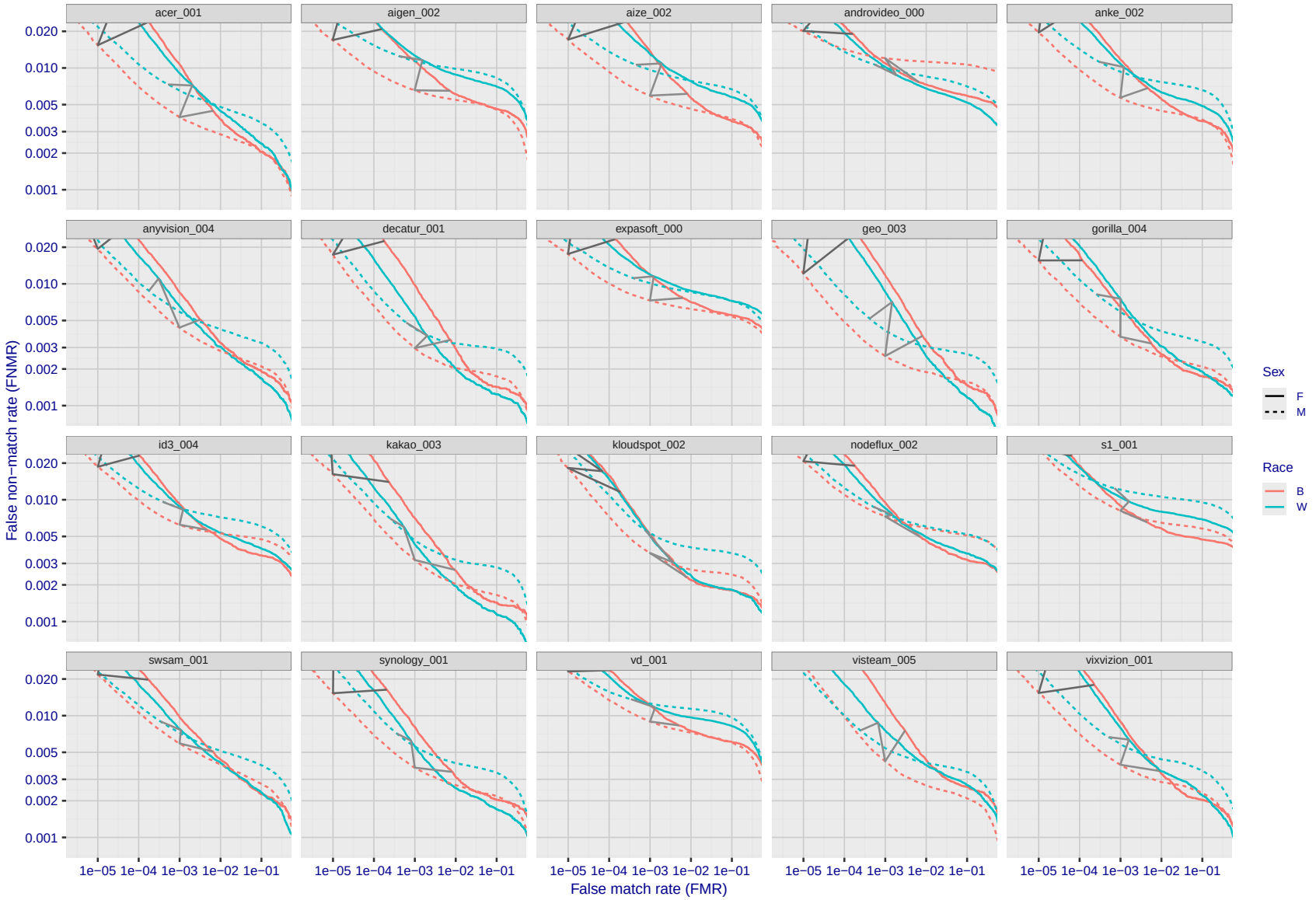

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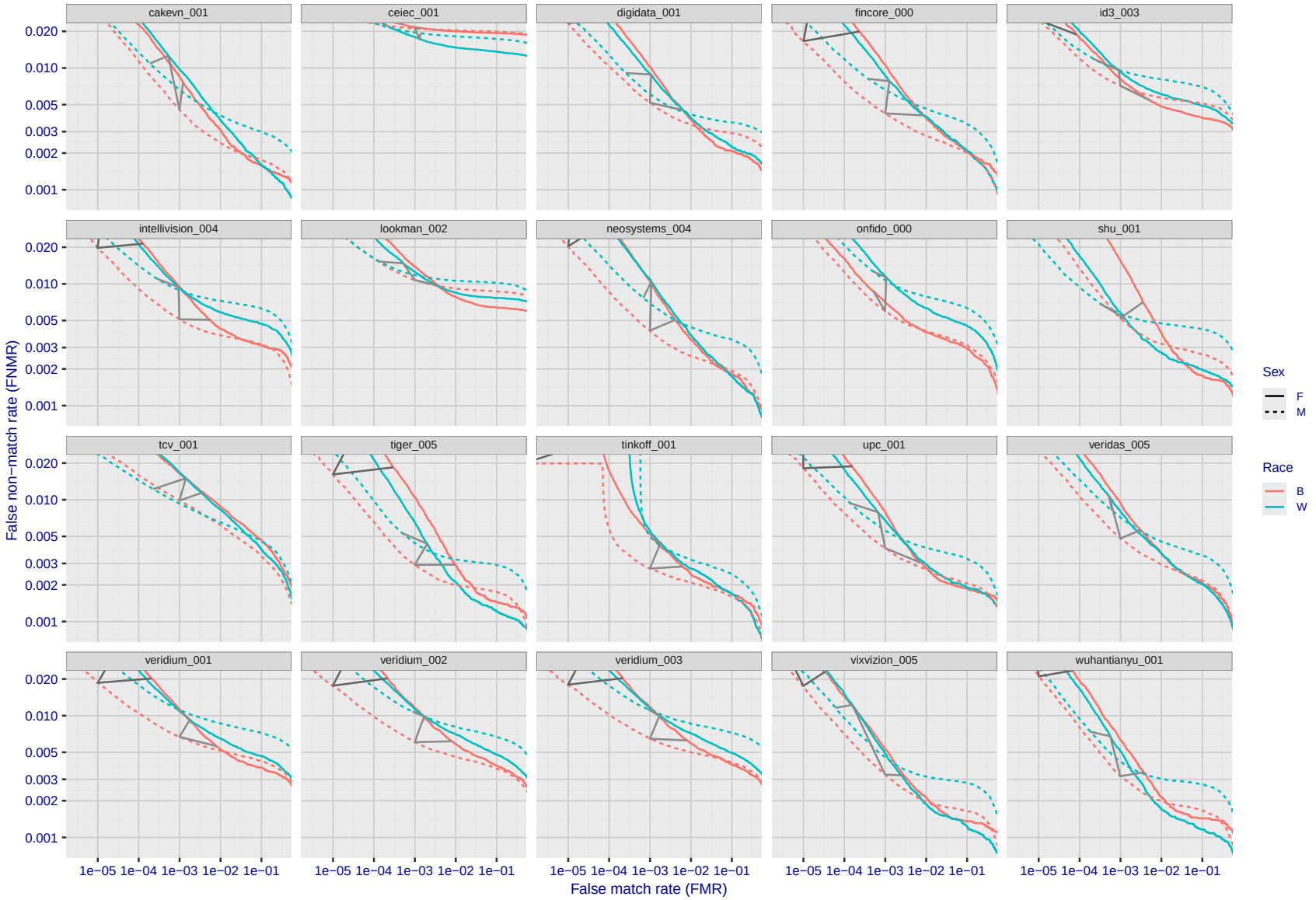
2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"



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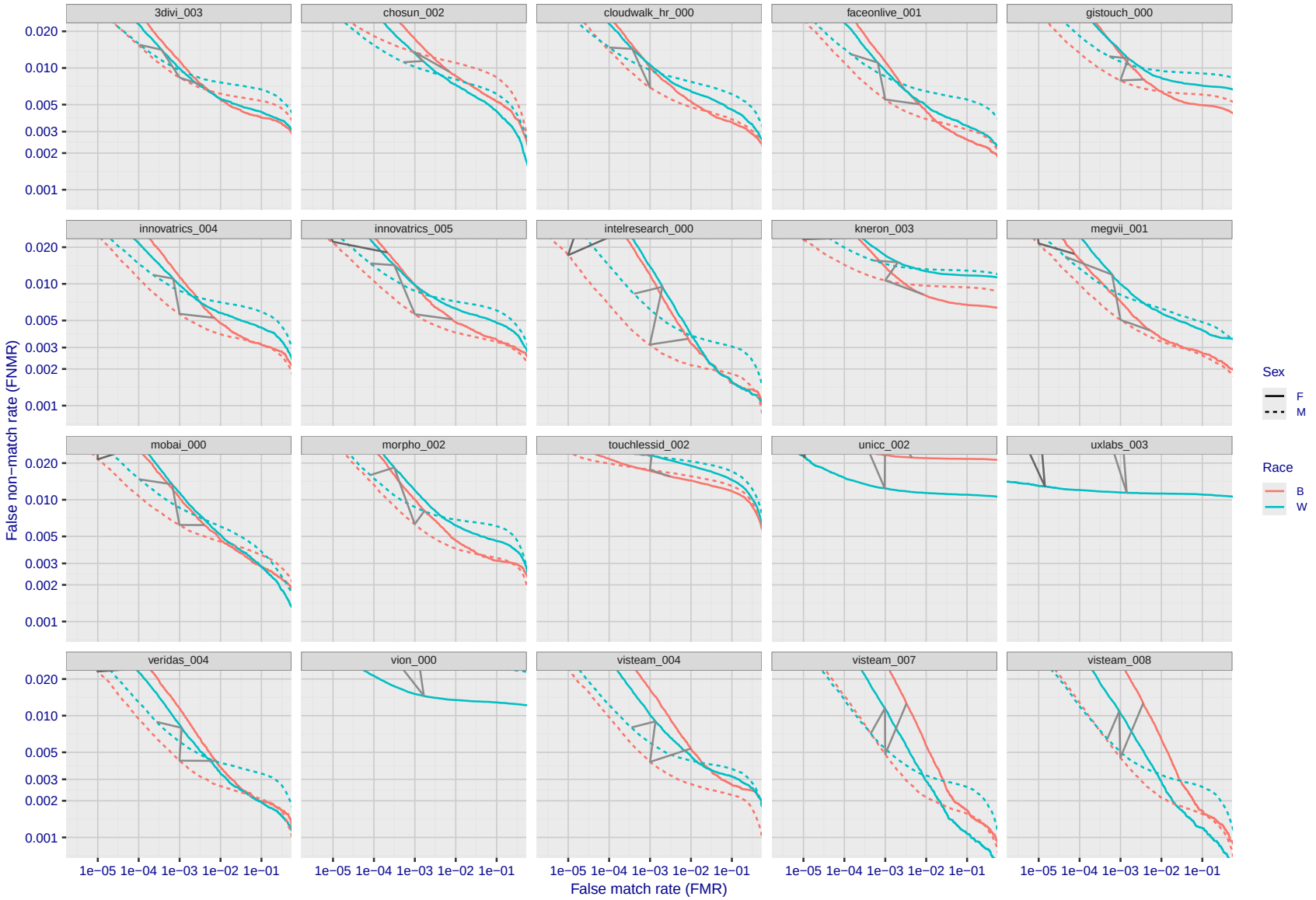

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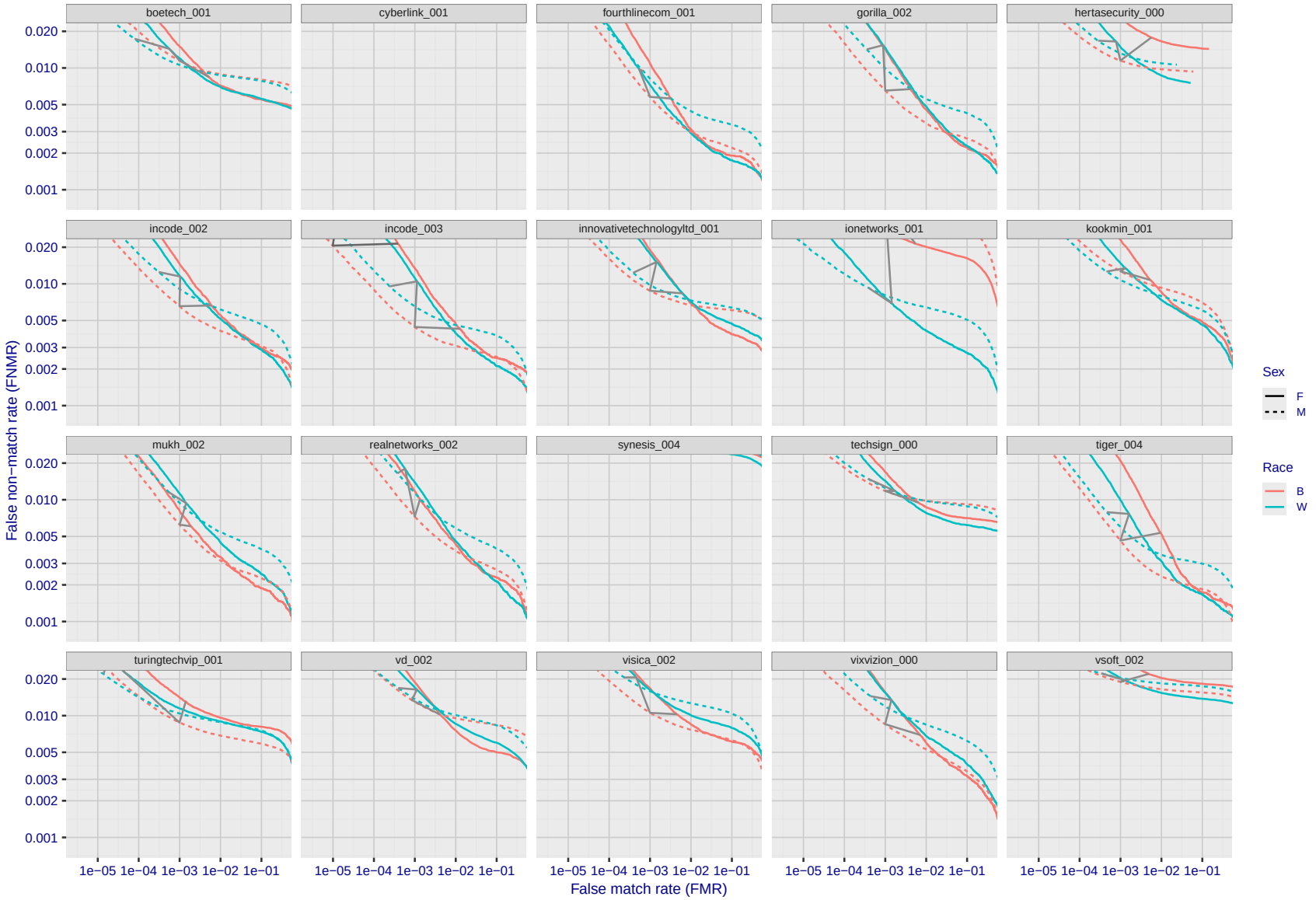

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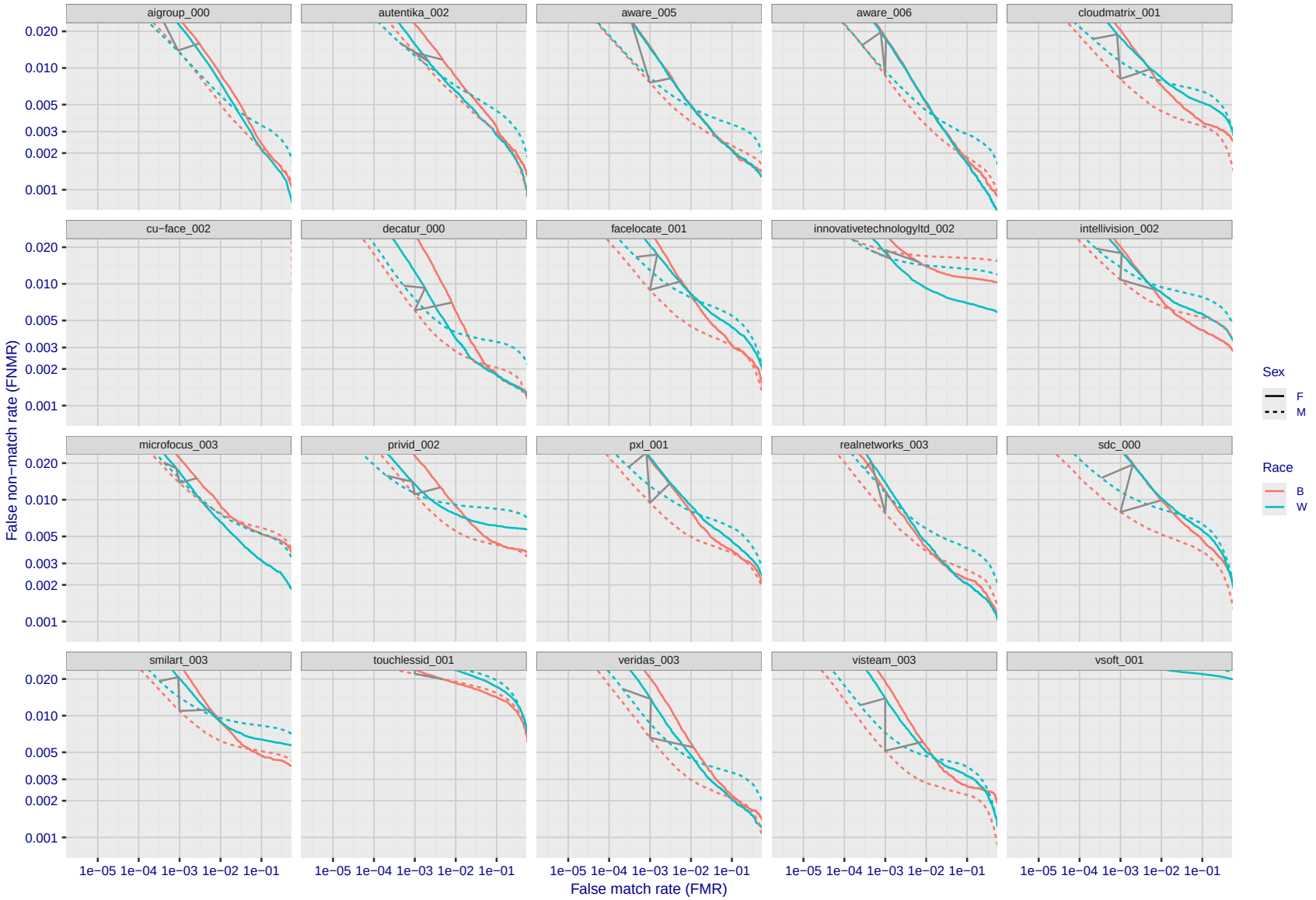

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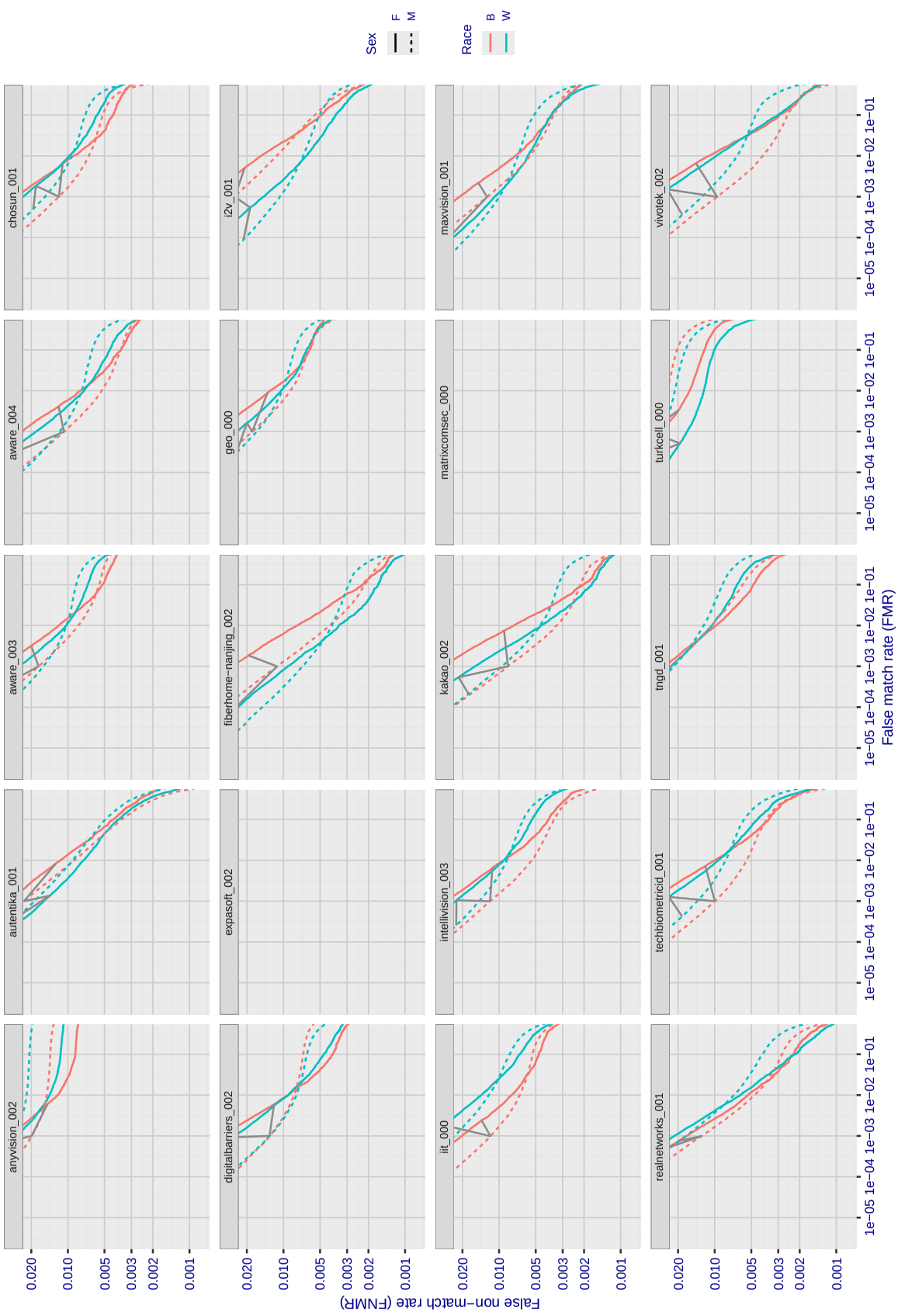

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FMR(T) "False match rate"

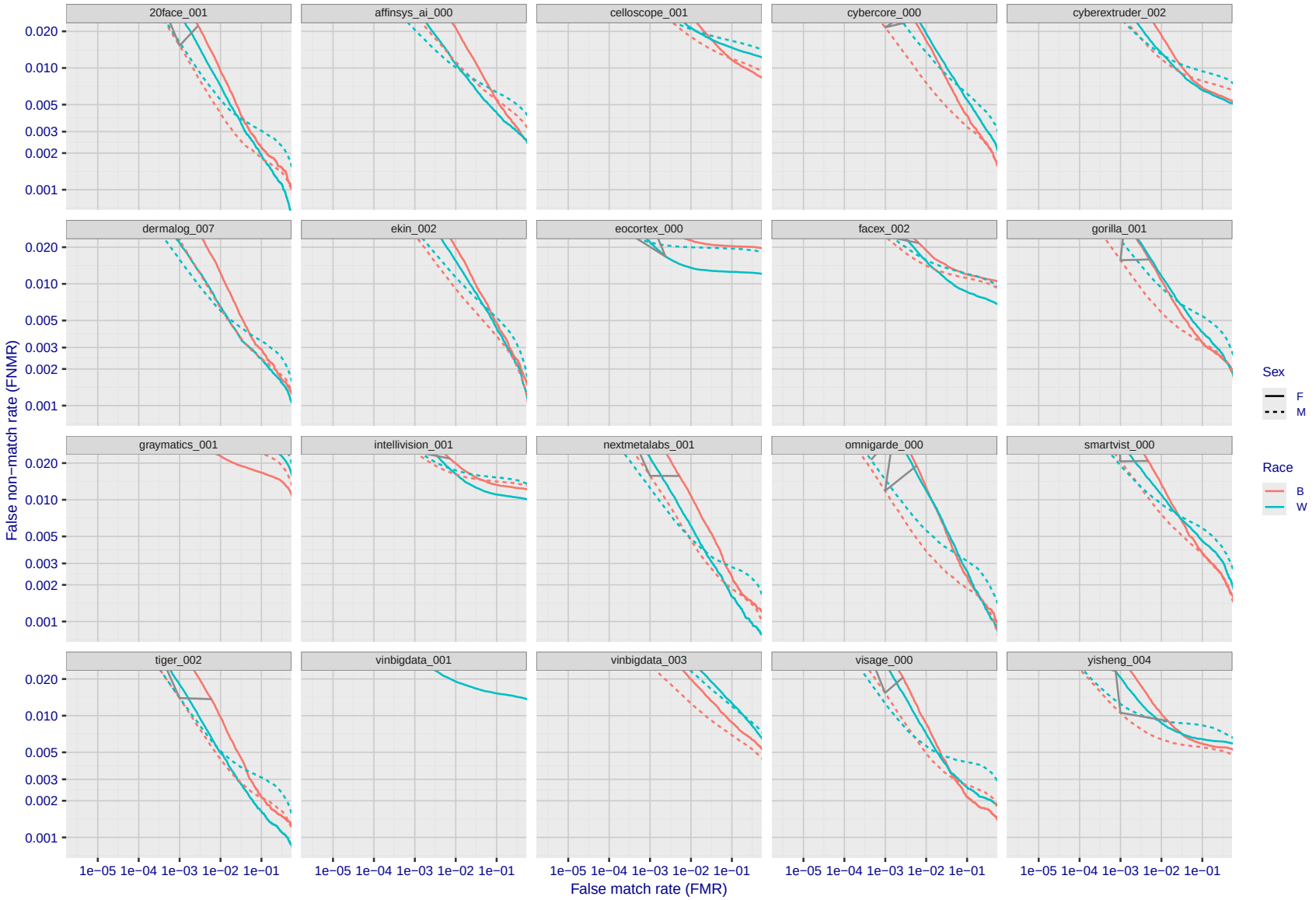

Figure 435: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

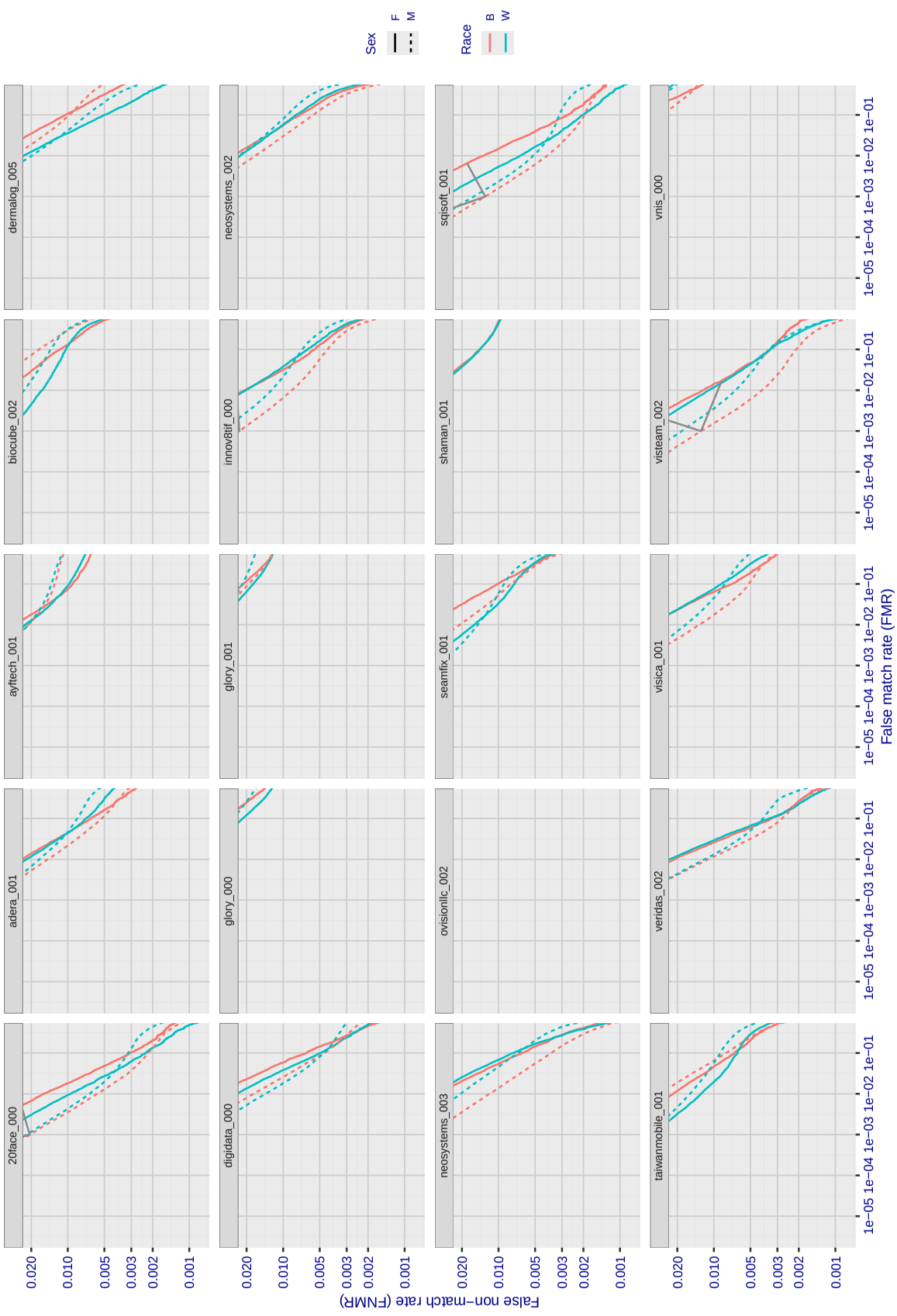

Figure 436: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is higher than for women at a fixed threshold but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.

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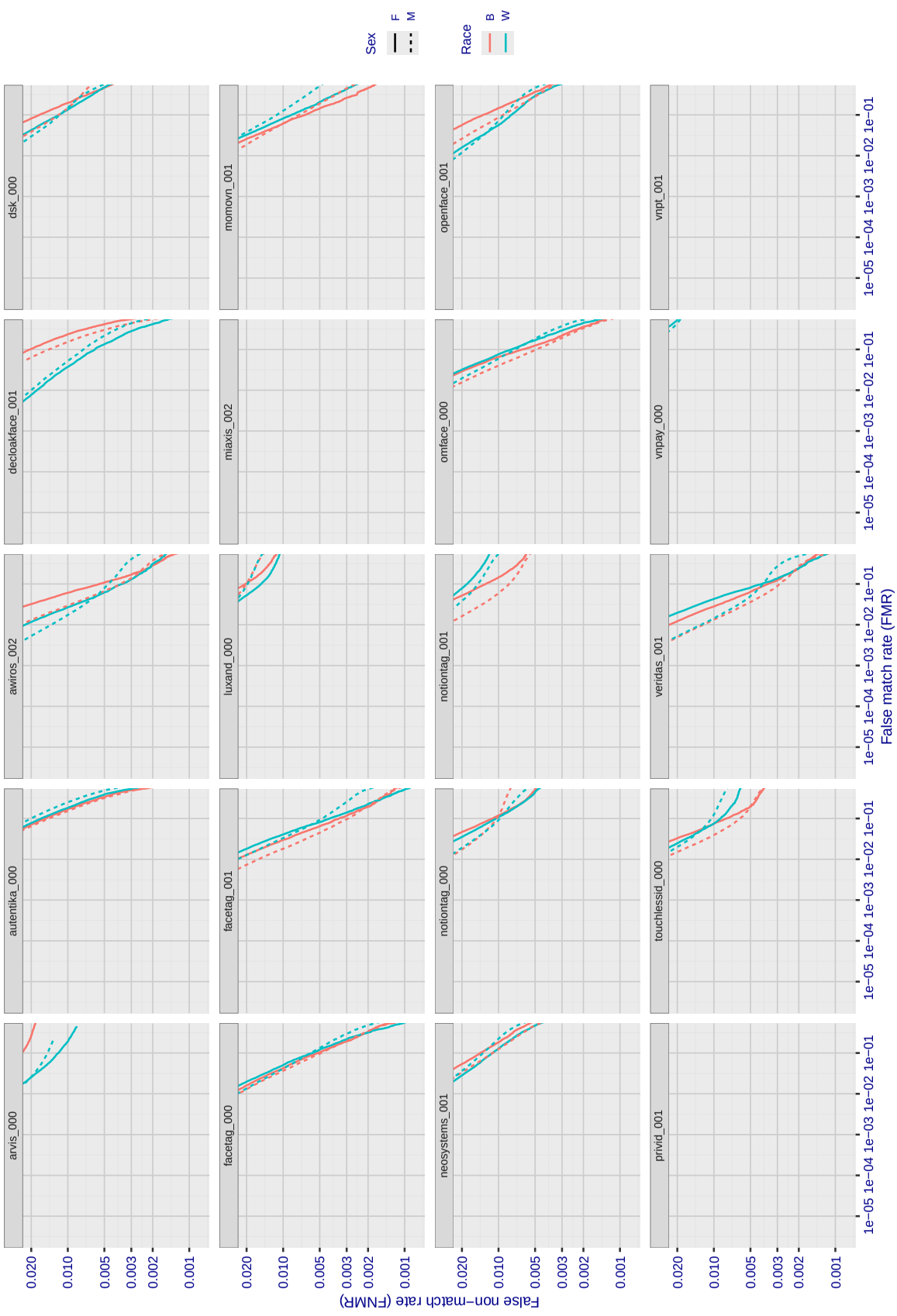

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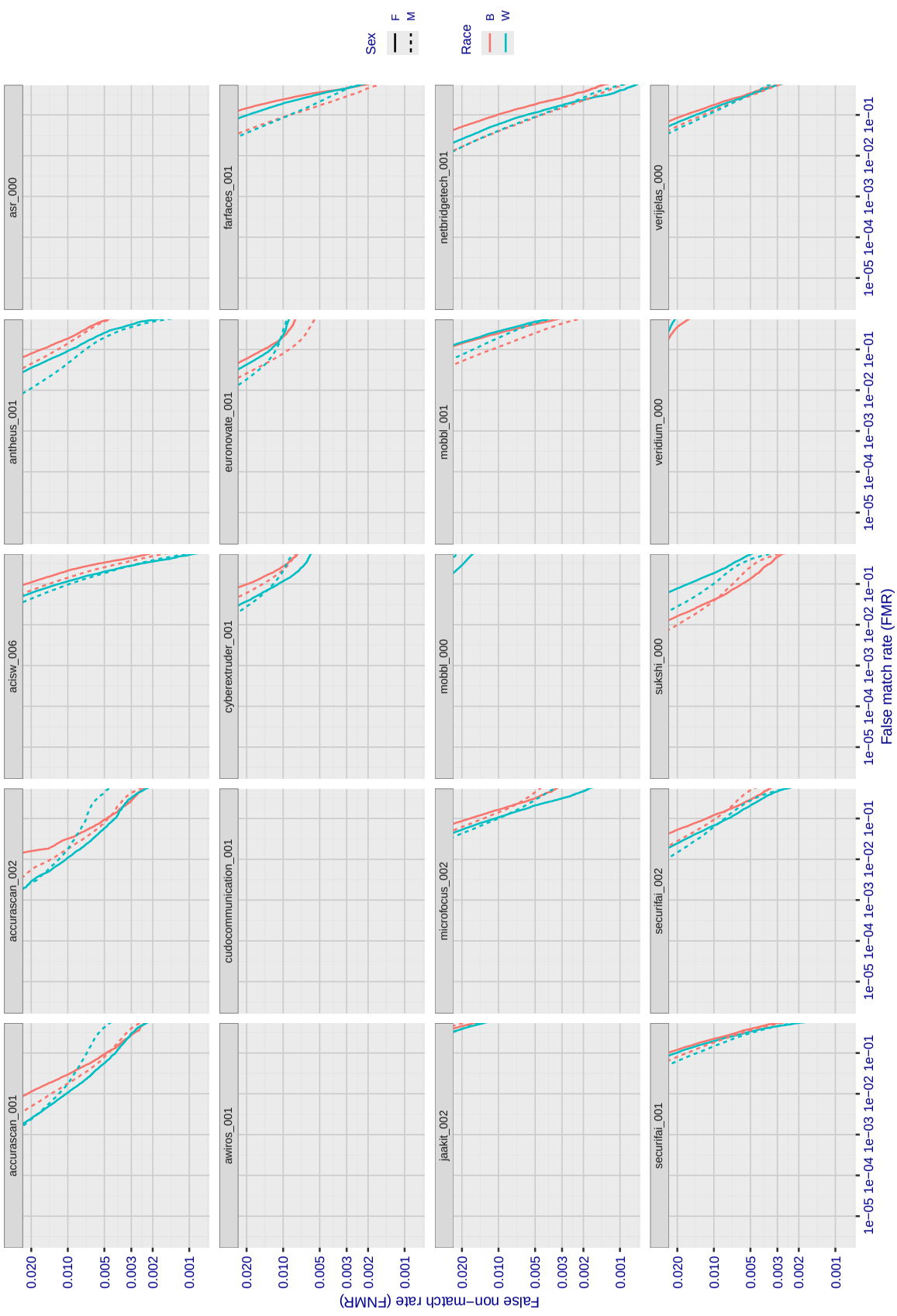

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FMR(T) "False match rate"

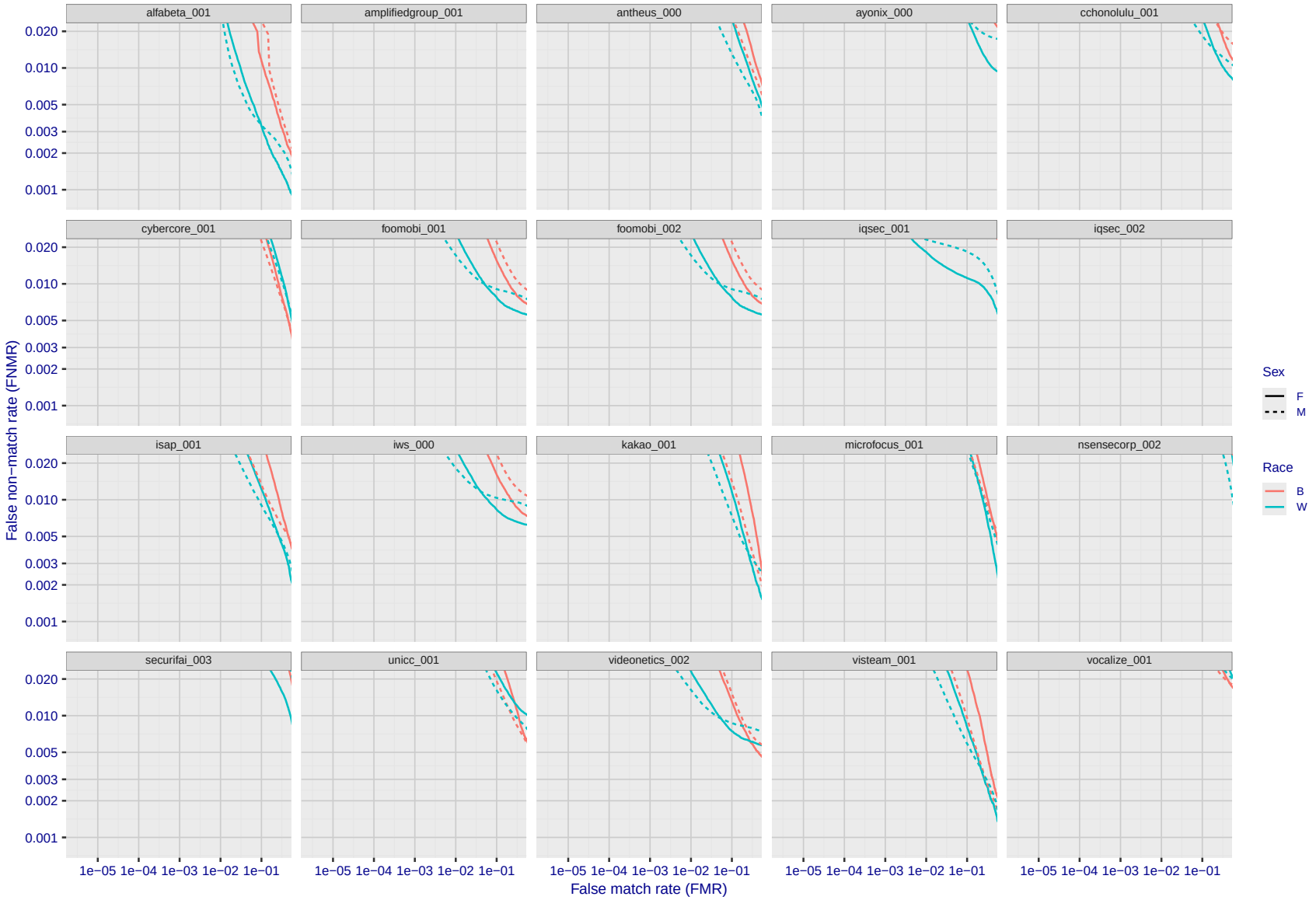

Figure 439: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

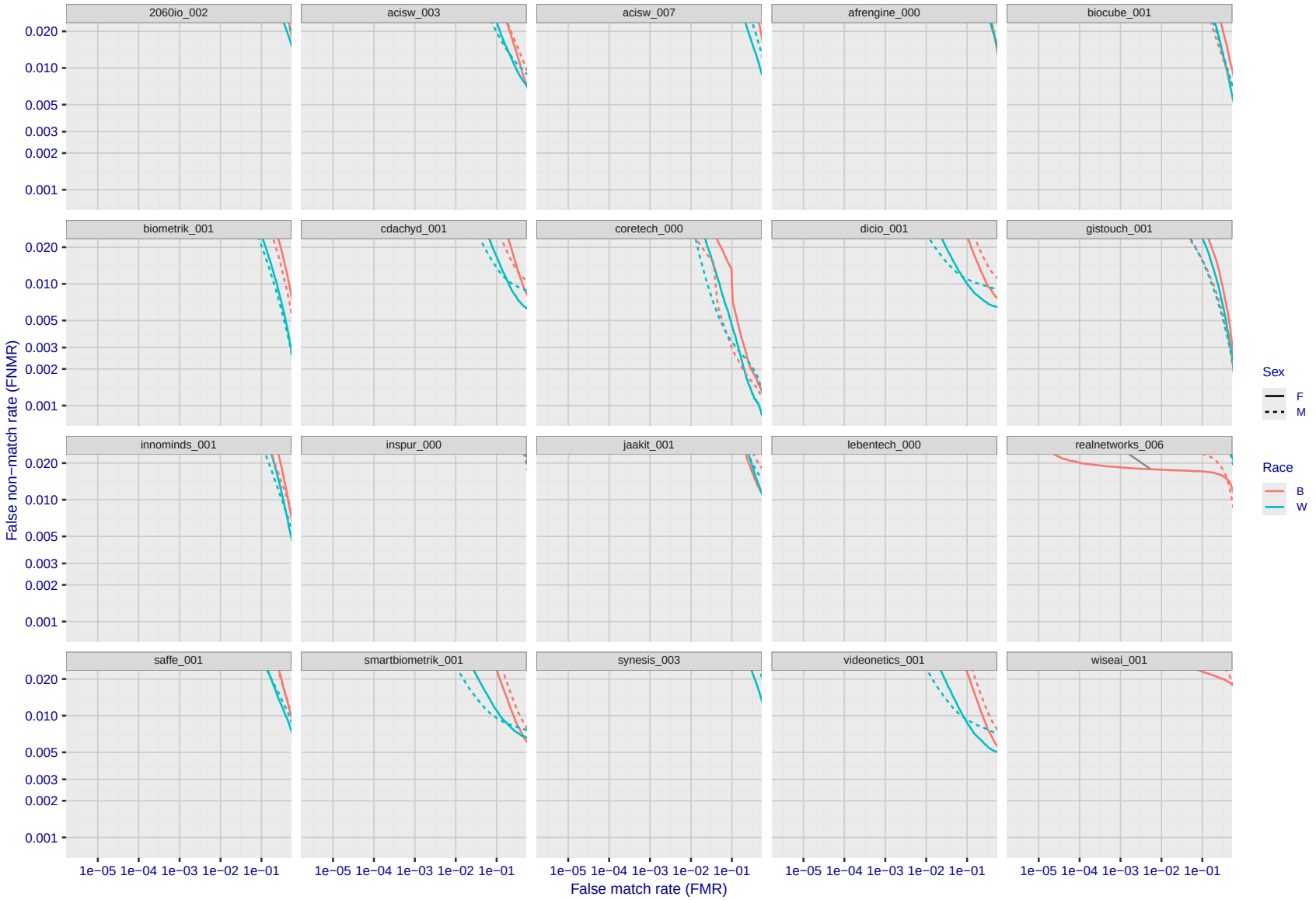

Figure 440: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women* at a fixed threshold *but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

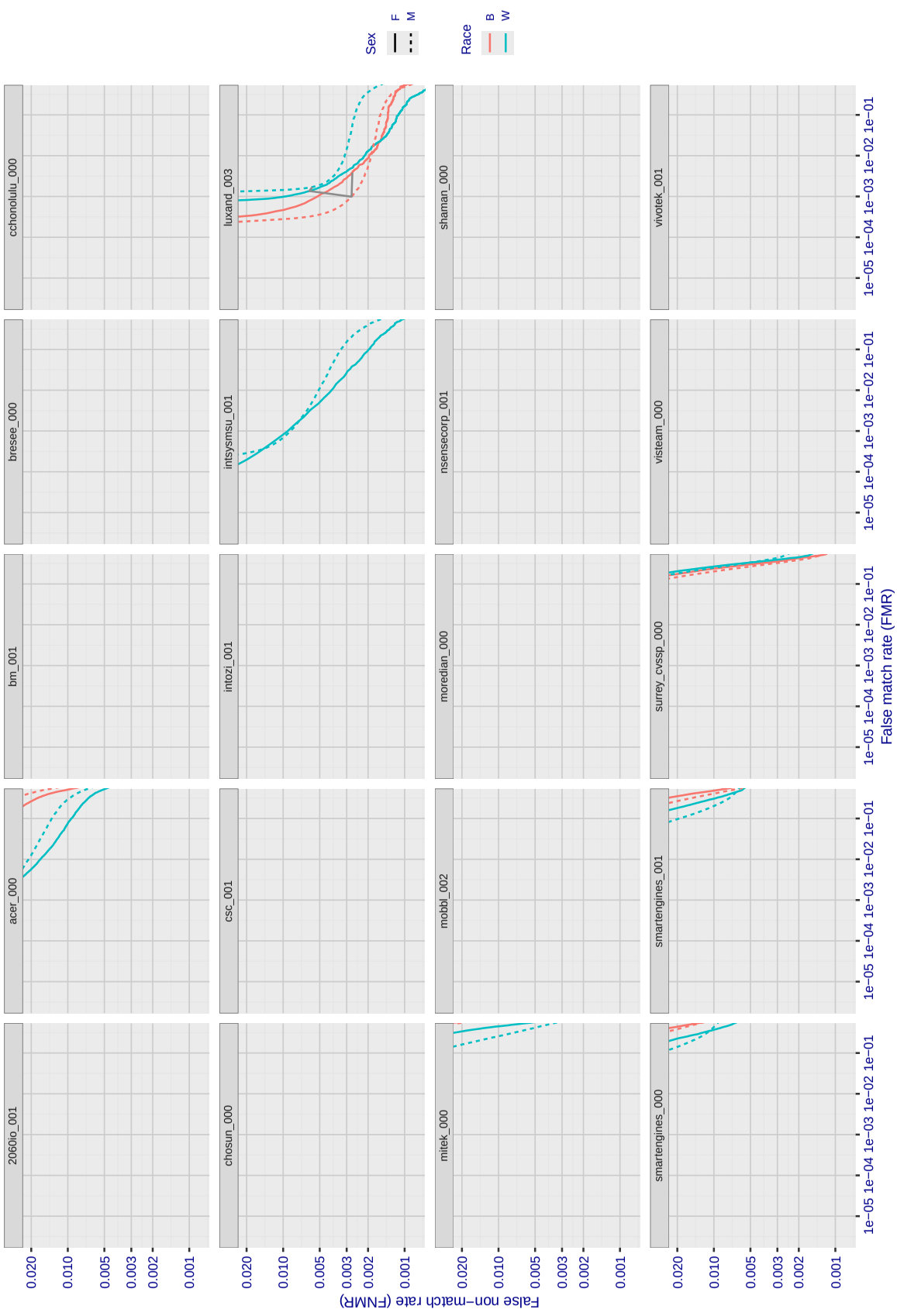

Figure 441: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both *FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is* higher *than for women at a fixed threshold but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

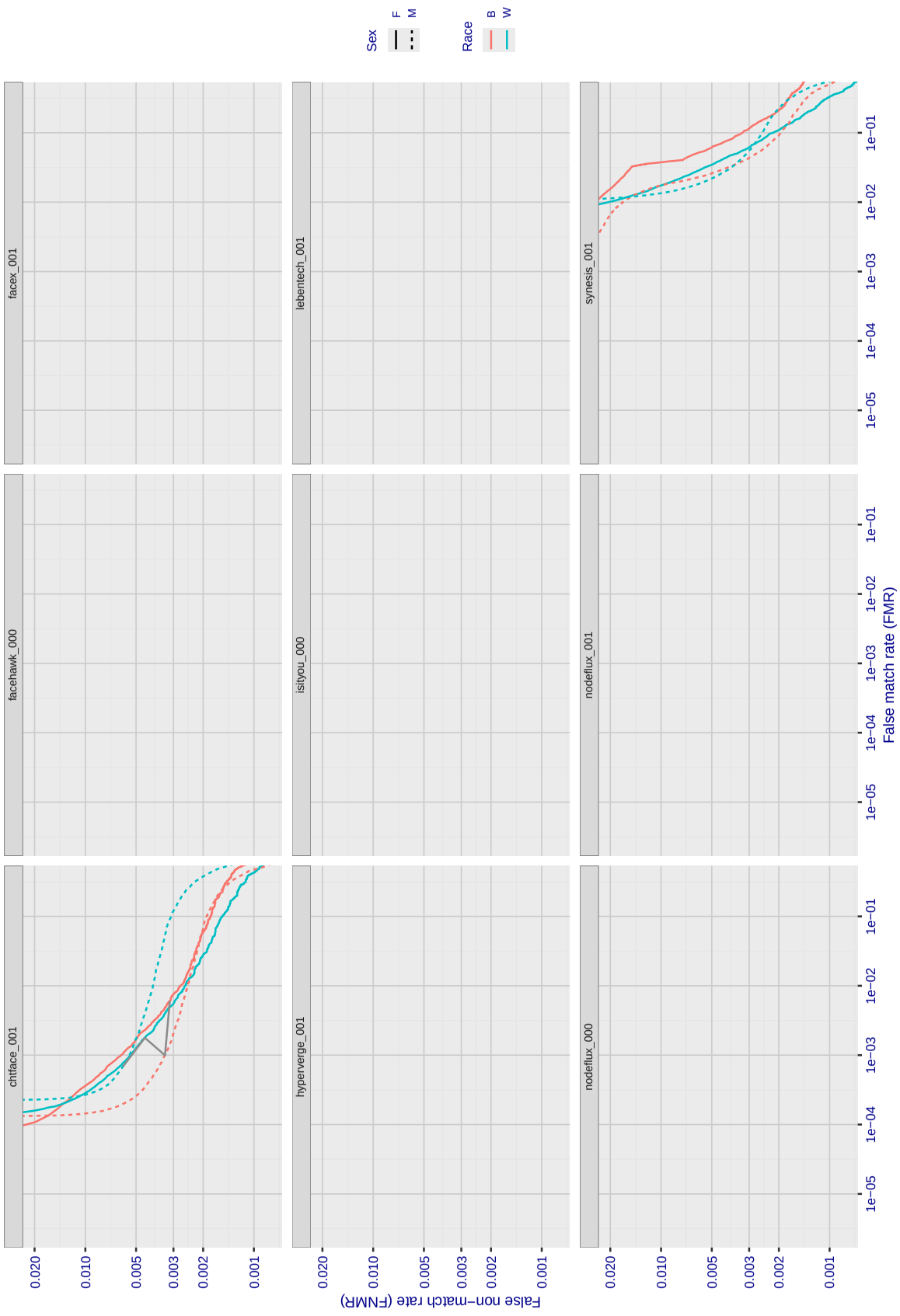

Figure 442: For the mugshot images, error tradeoff characteristics for white females, black females, black males and white males. The Z-shaped grey lines correspond to fixed thresholds, showing both FNMR and FMR vary at one T value. Note: Many of the plots will naively be read as saying women gives worse error rates than men because the solid traces lie above the dotted ones. However, this is misleading and incomplete: The grey lines show the traces reveal horizontal shifts. Thus for the cogent-003 algorithm FNMR for men is higher than for women at a fixed threshold but, at the same time, FMR is higher for women - see Figure 596. As access control systems almost always operate at a fixed threshold, the naive interpretation is incorrect.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

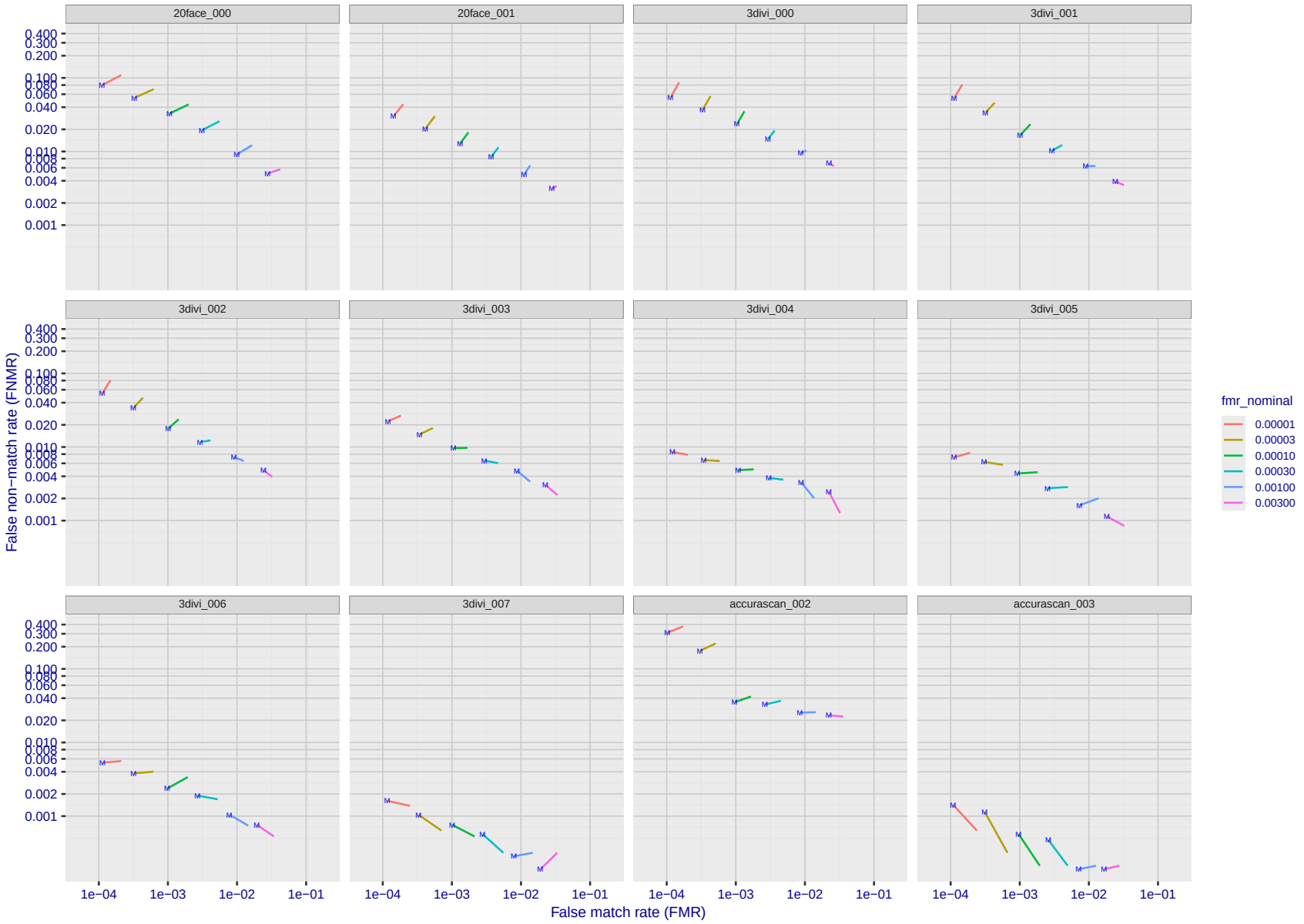

Figure 443: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

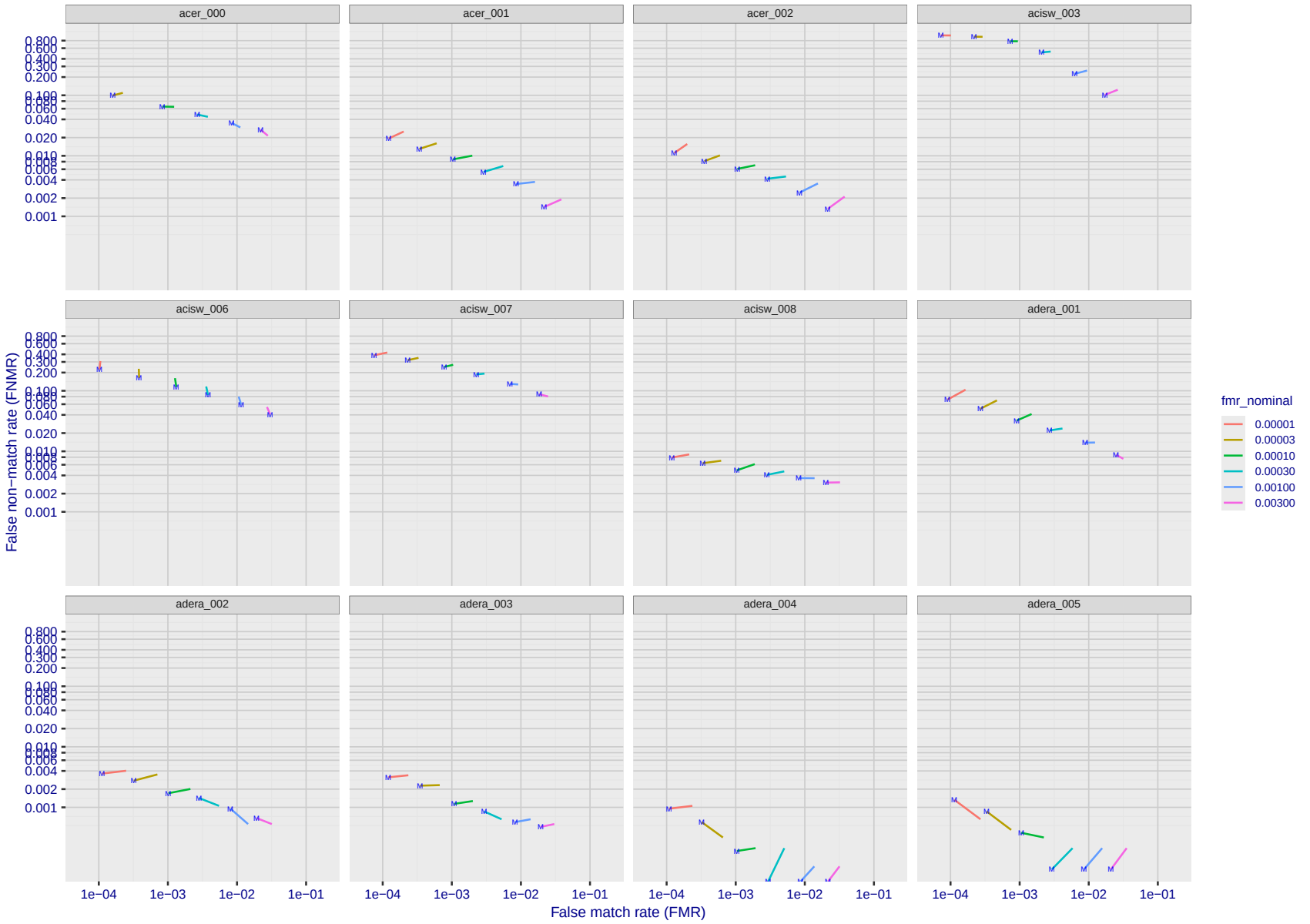

Figure 444: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

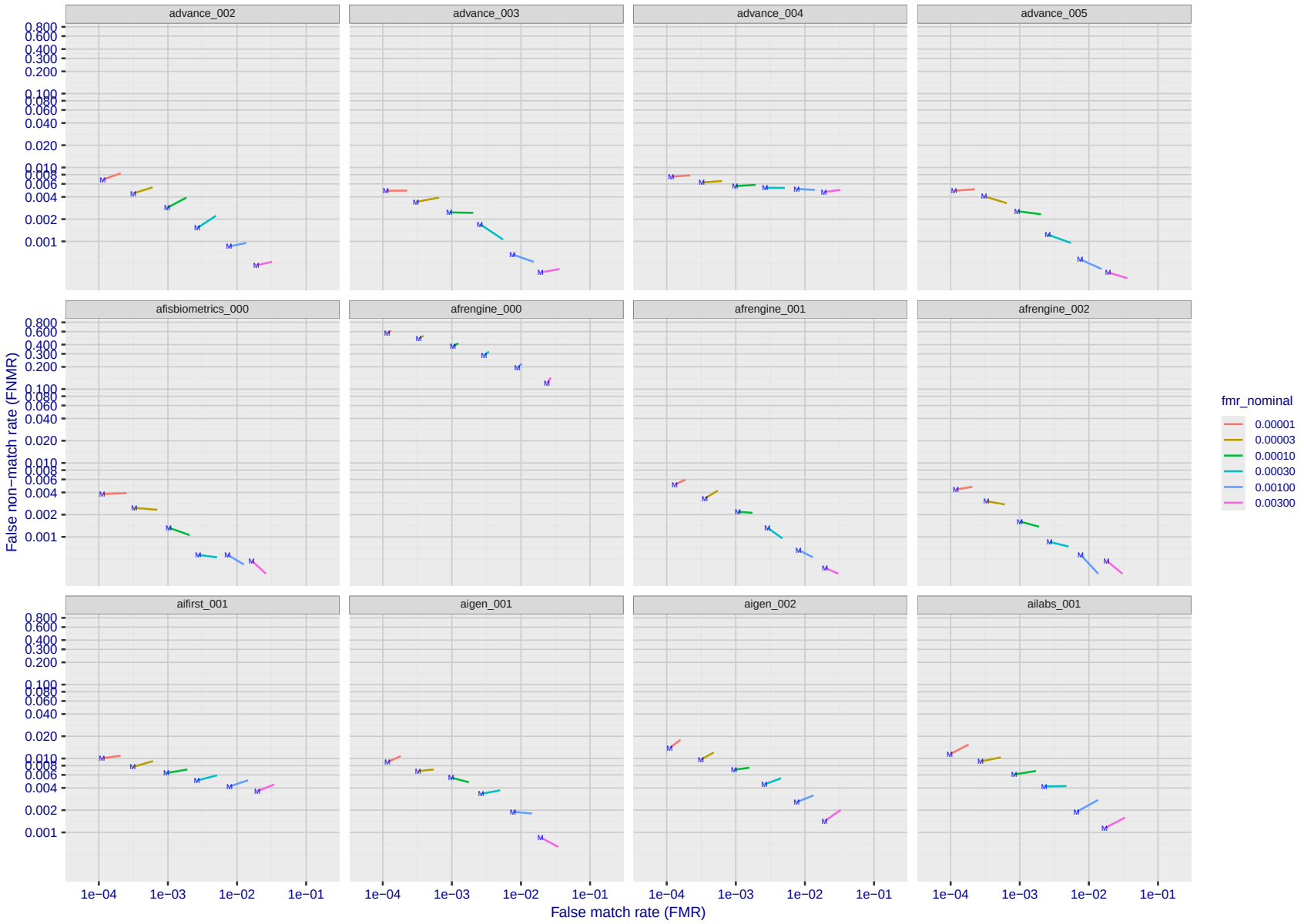

Figure 445: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

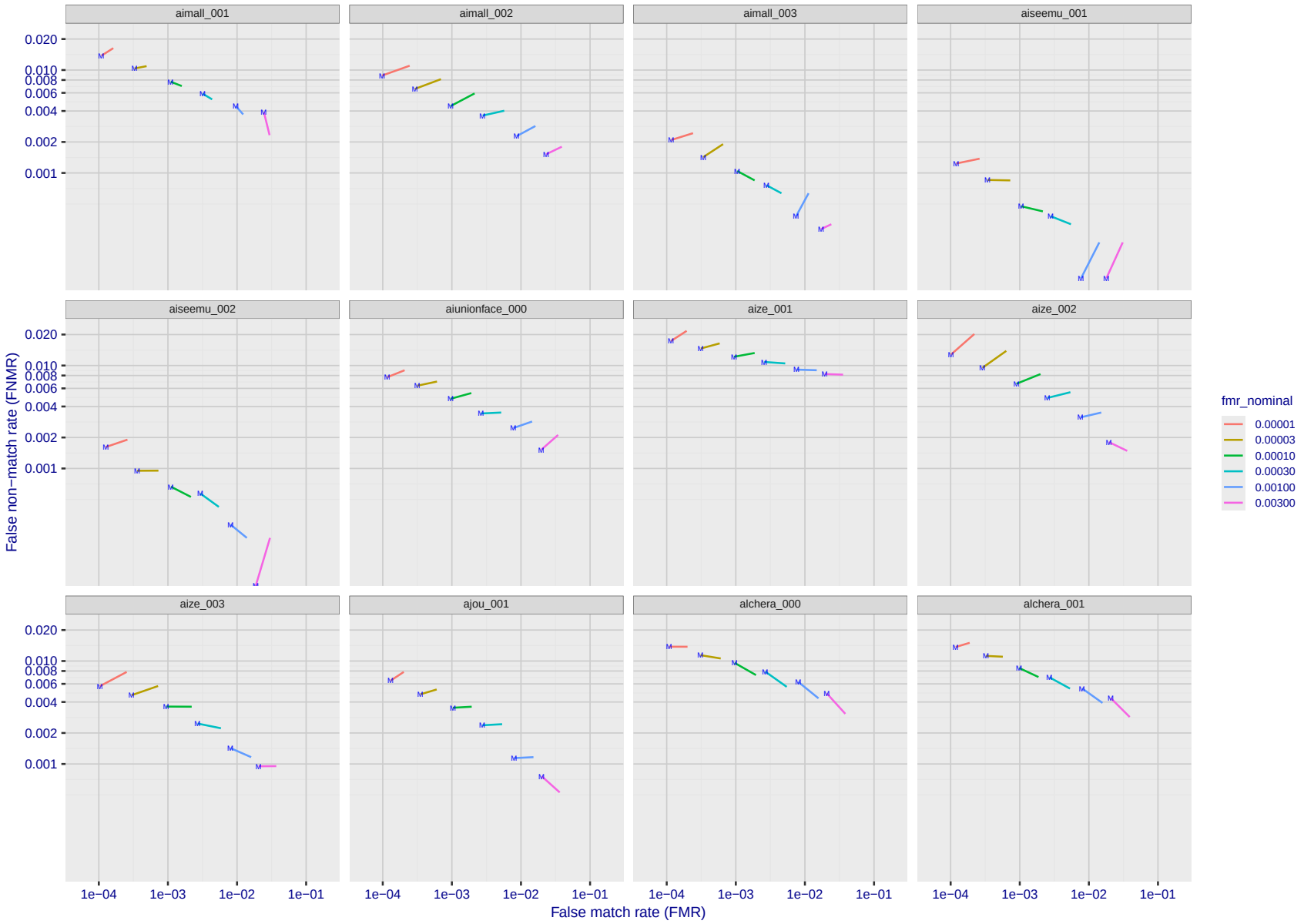

Figure 446: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

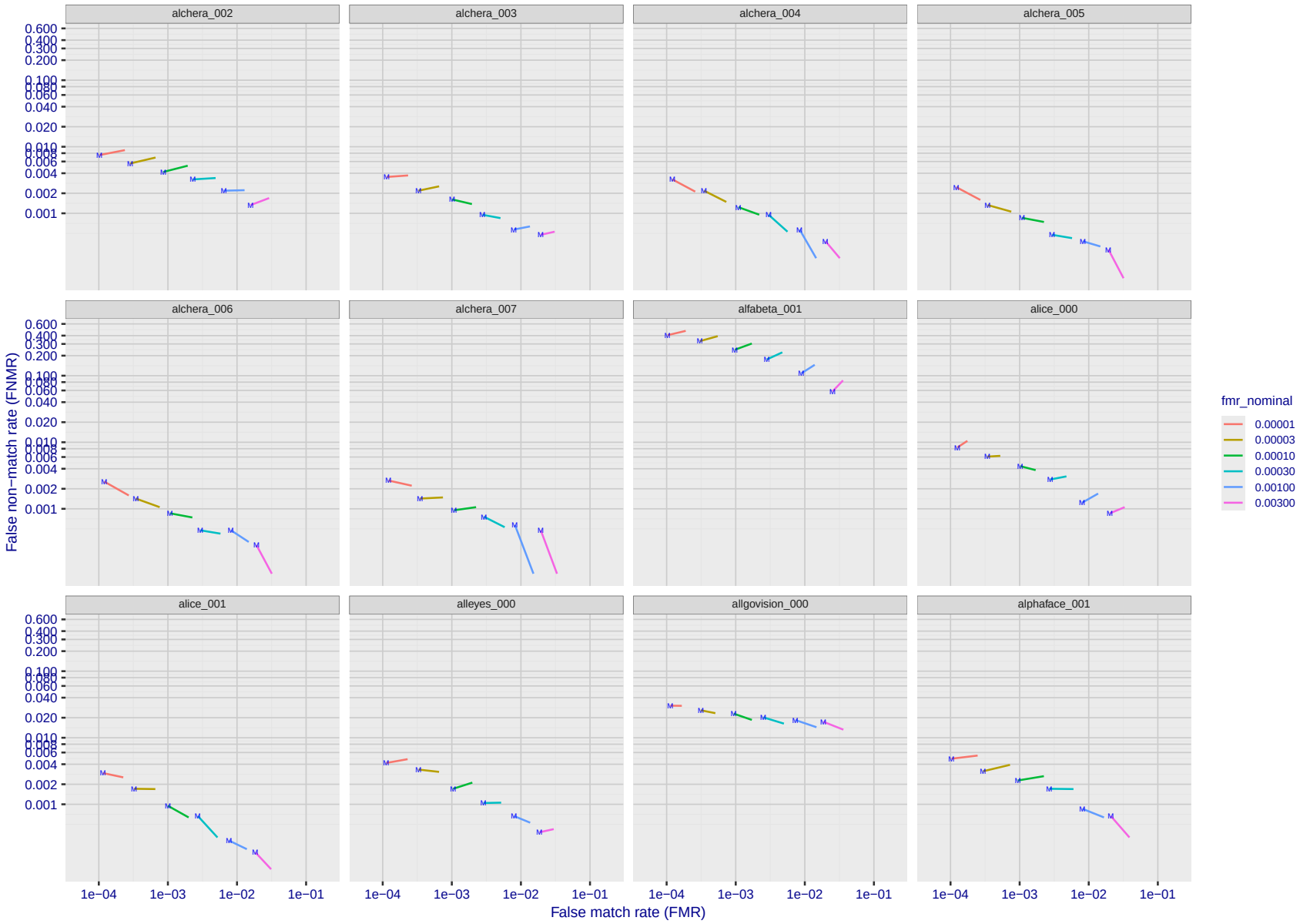

Figure 447: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

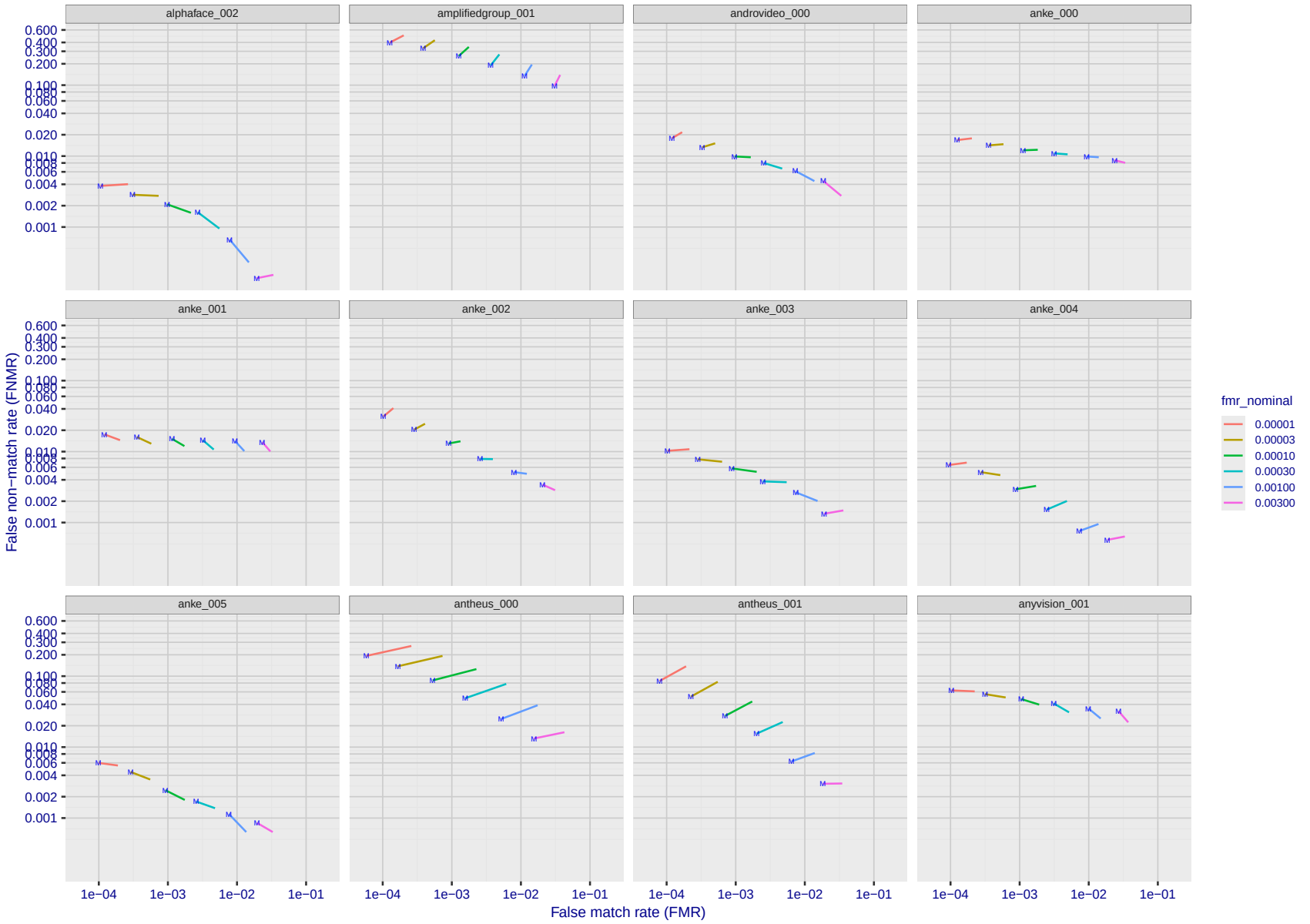

Figure 448: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

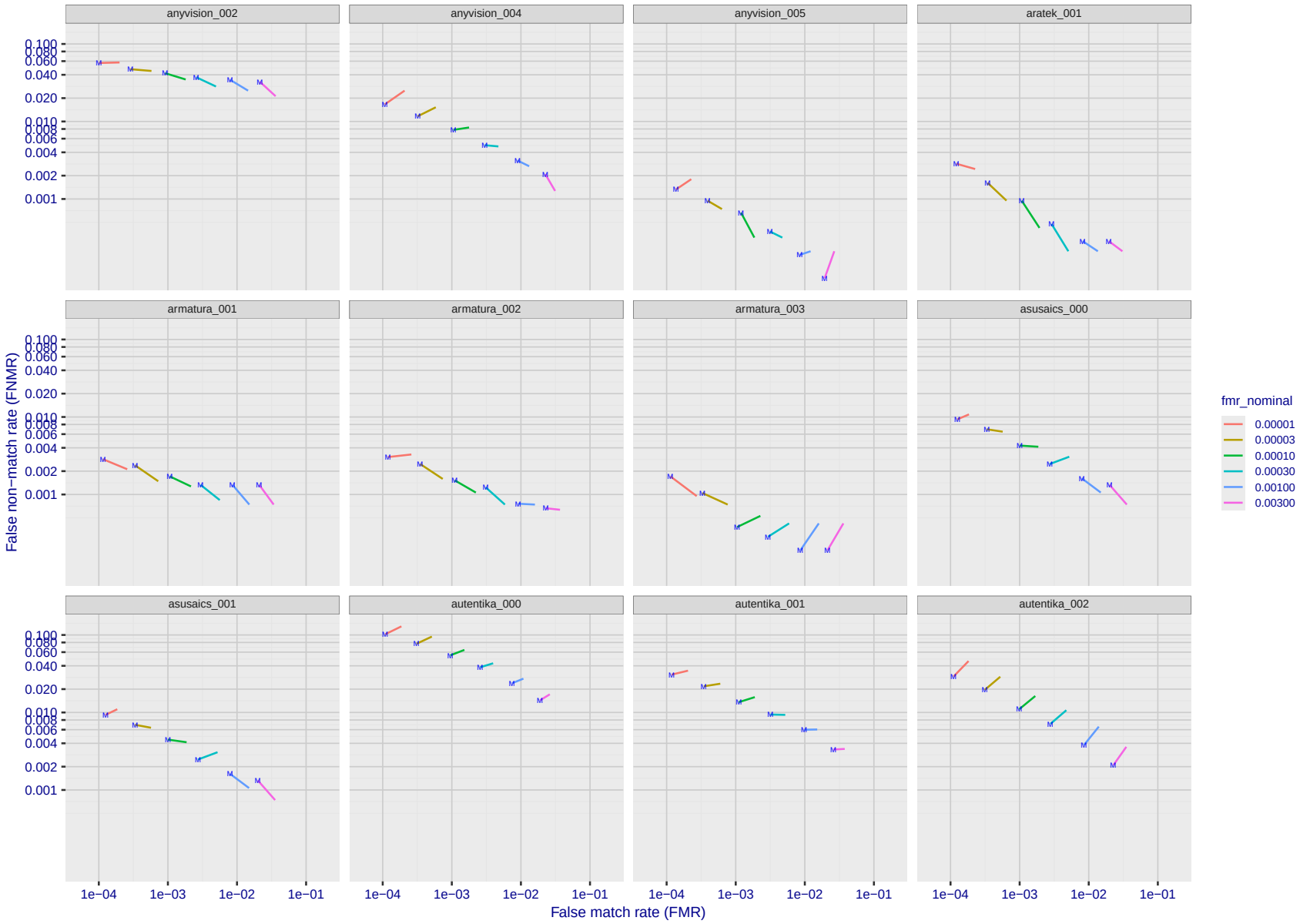

Figure 449: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

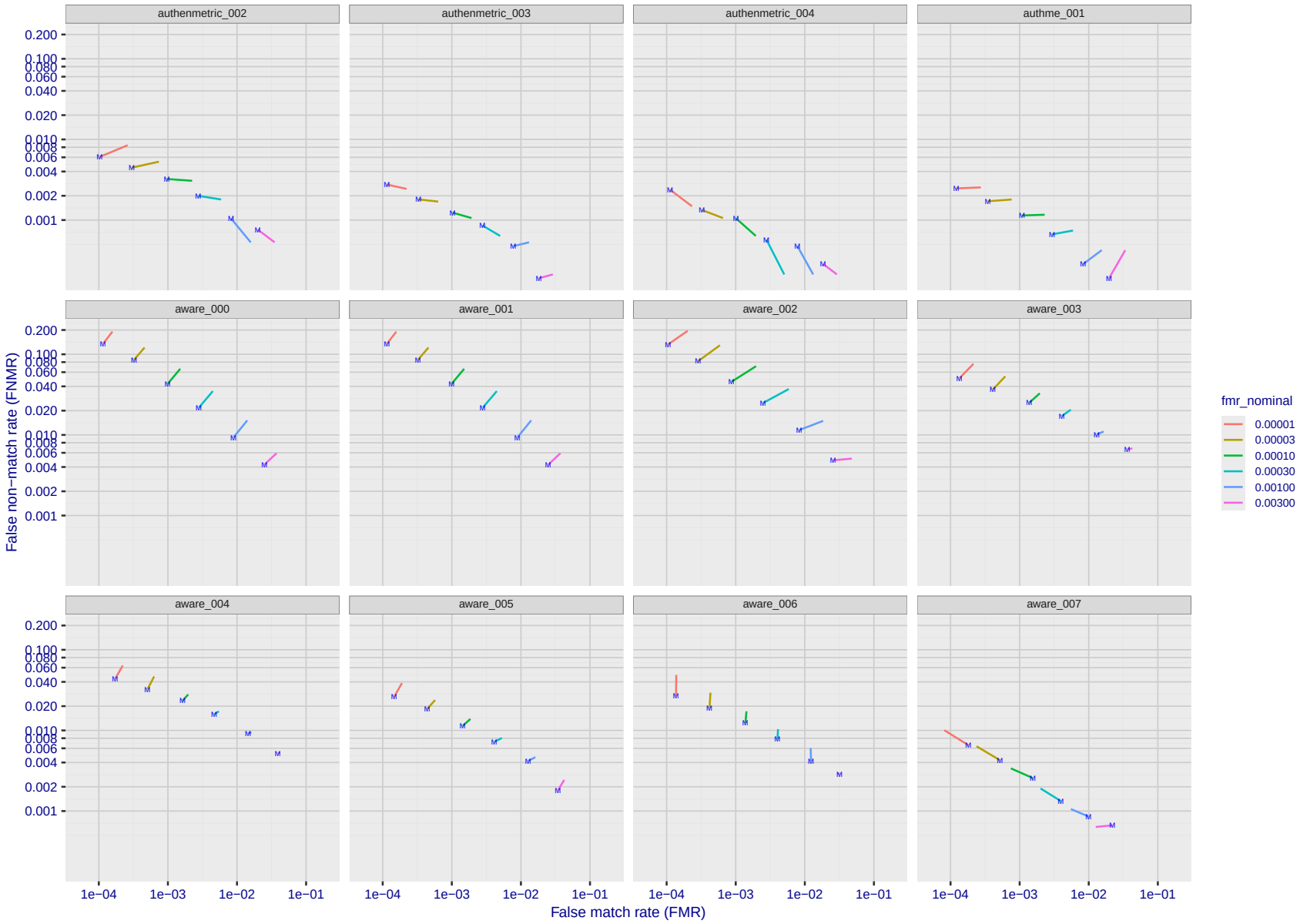

Figure 450: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

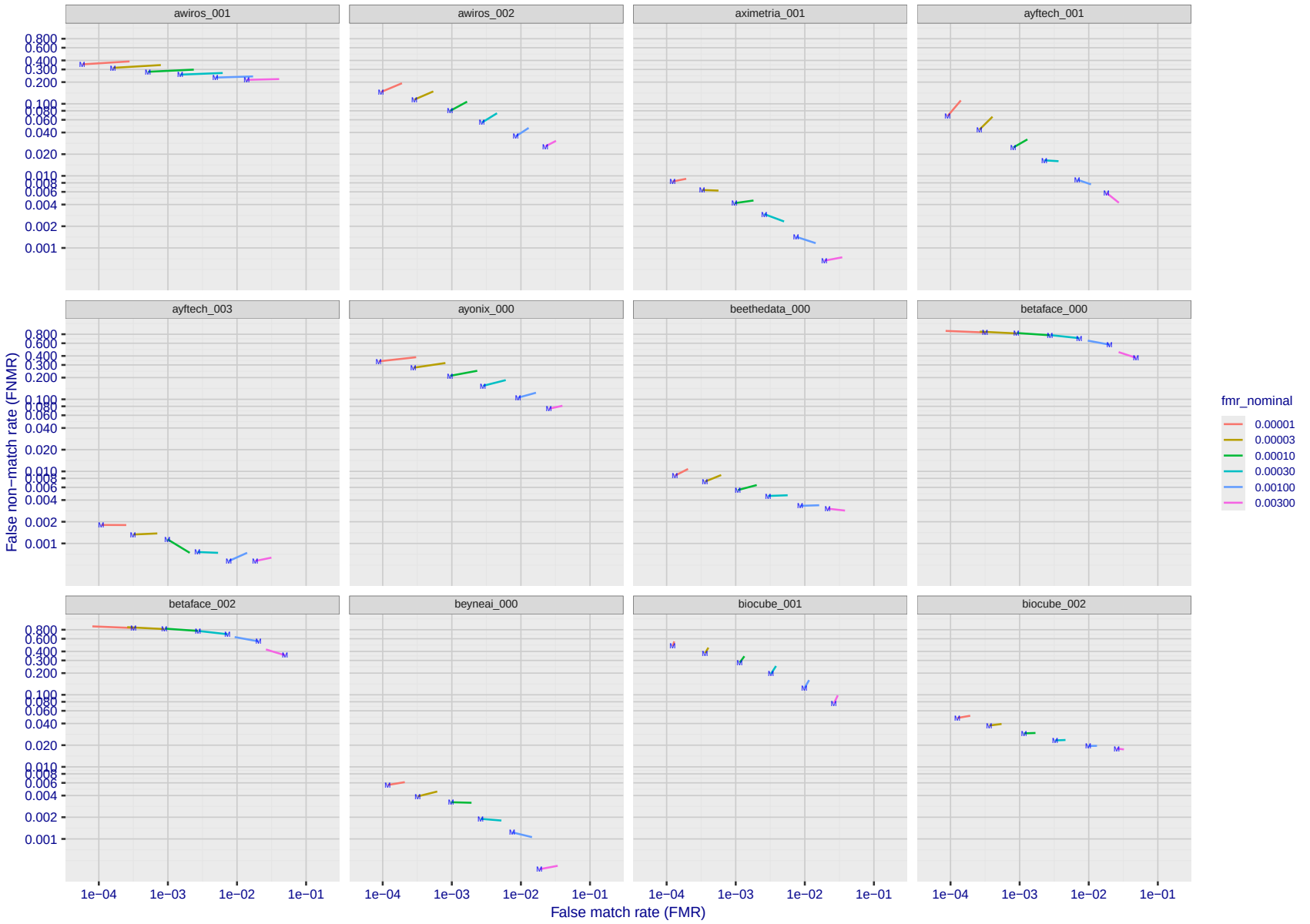

Figure 451: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

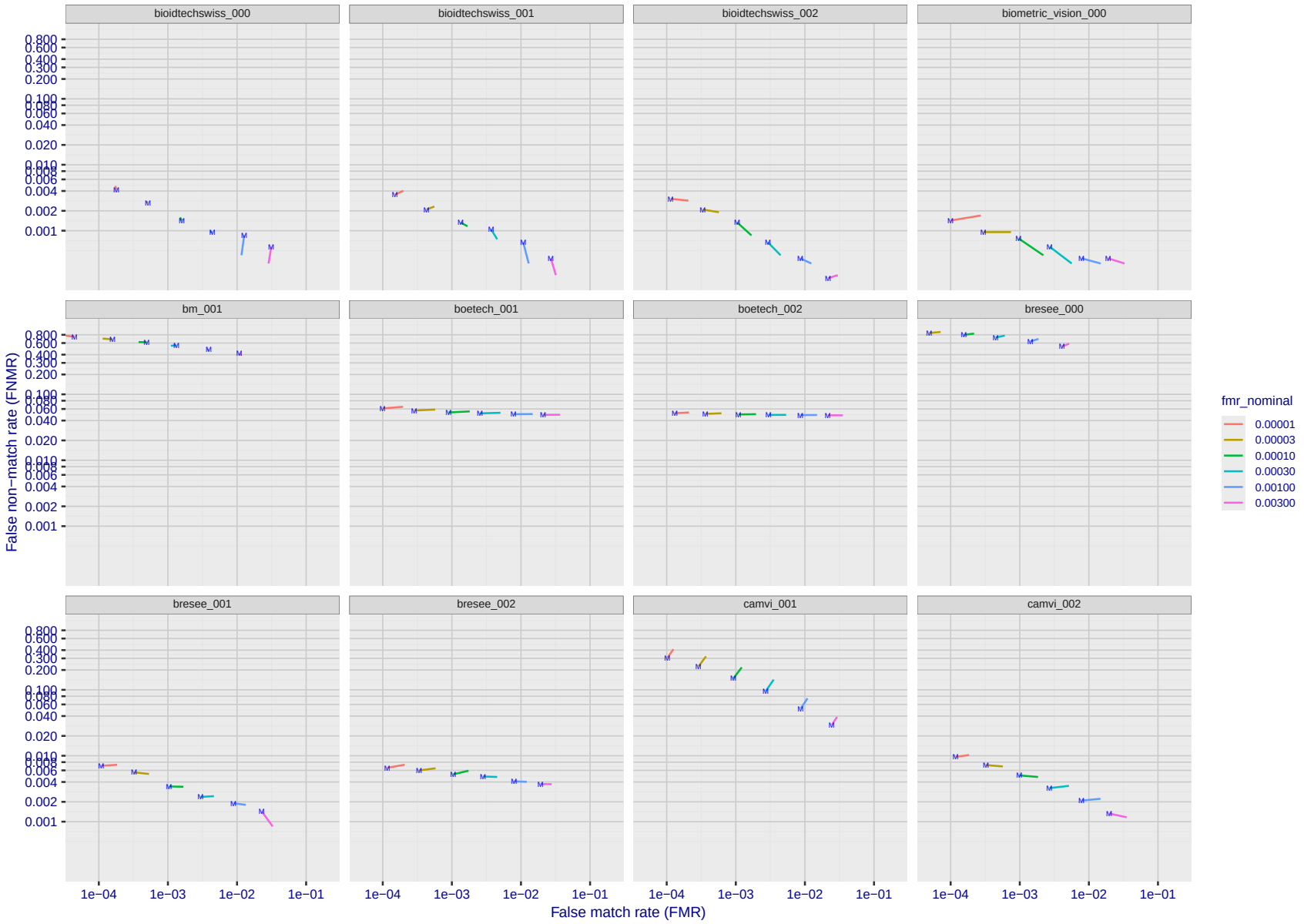

Figure 452: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

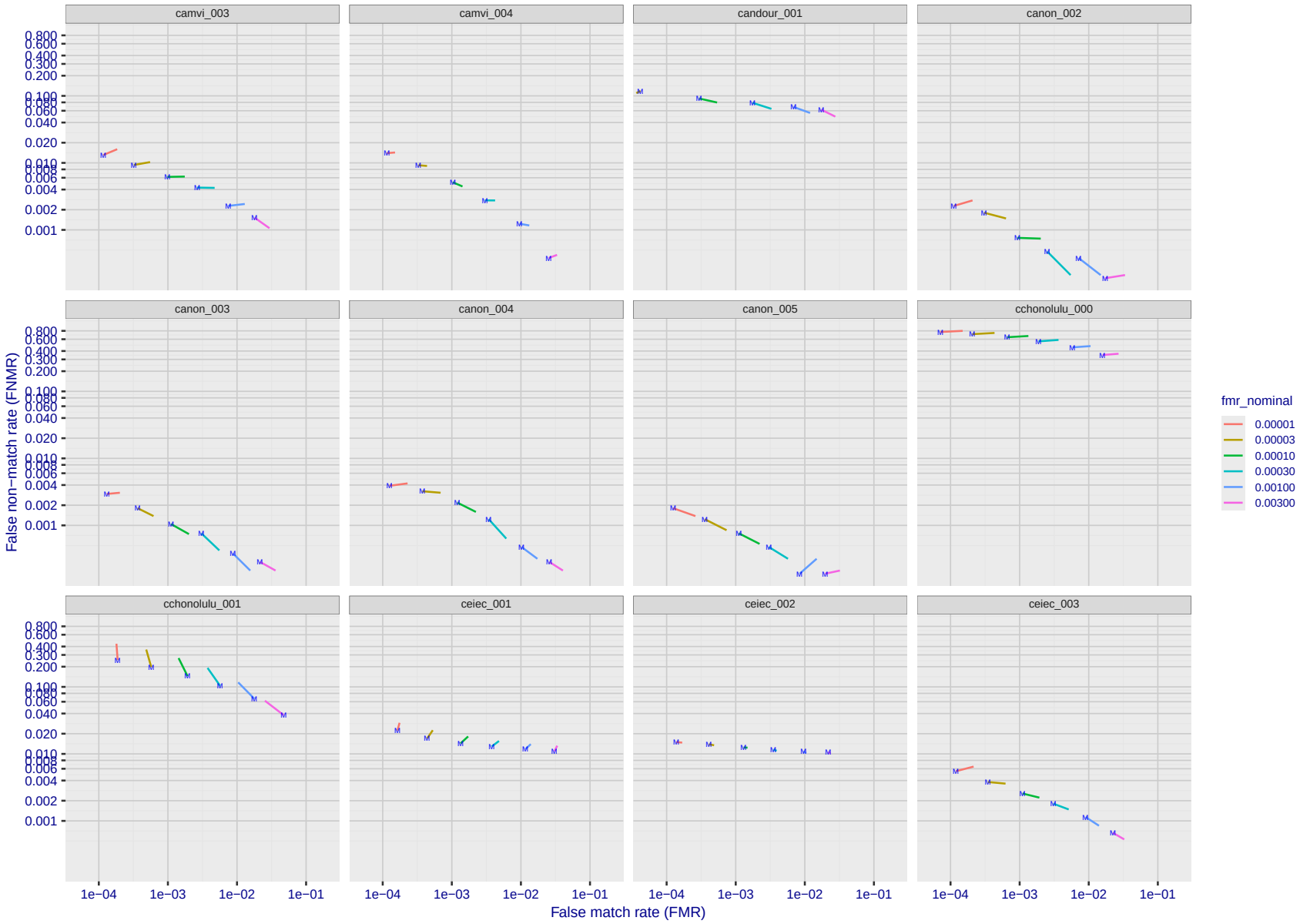

Figure 453: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

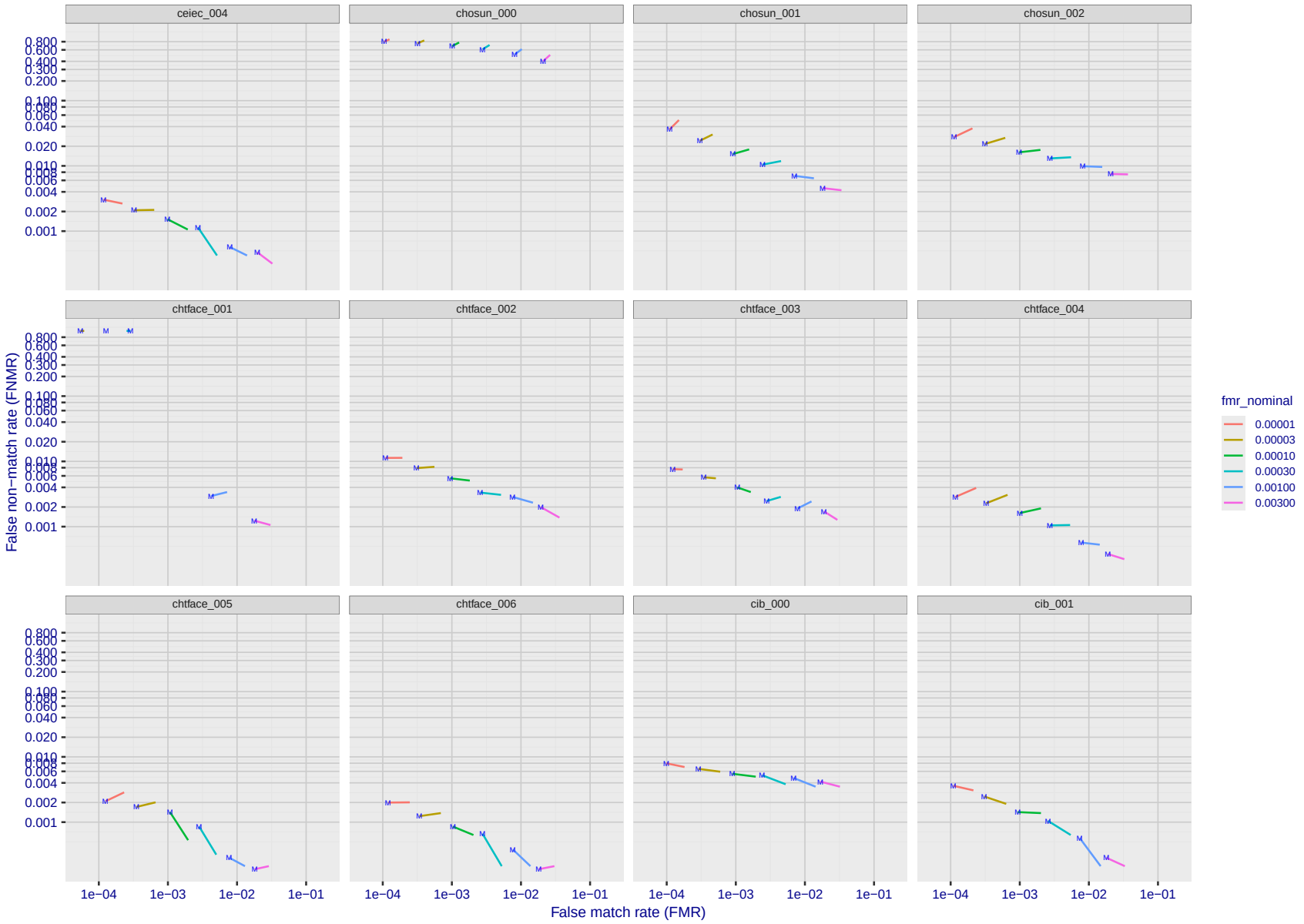

Figure 454: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

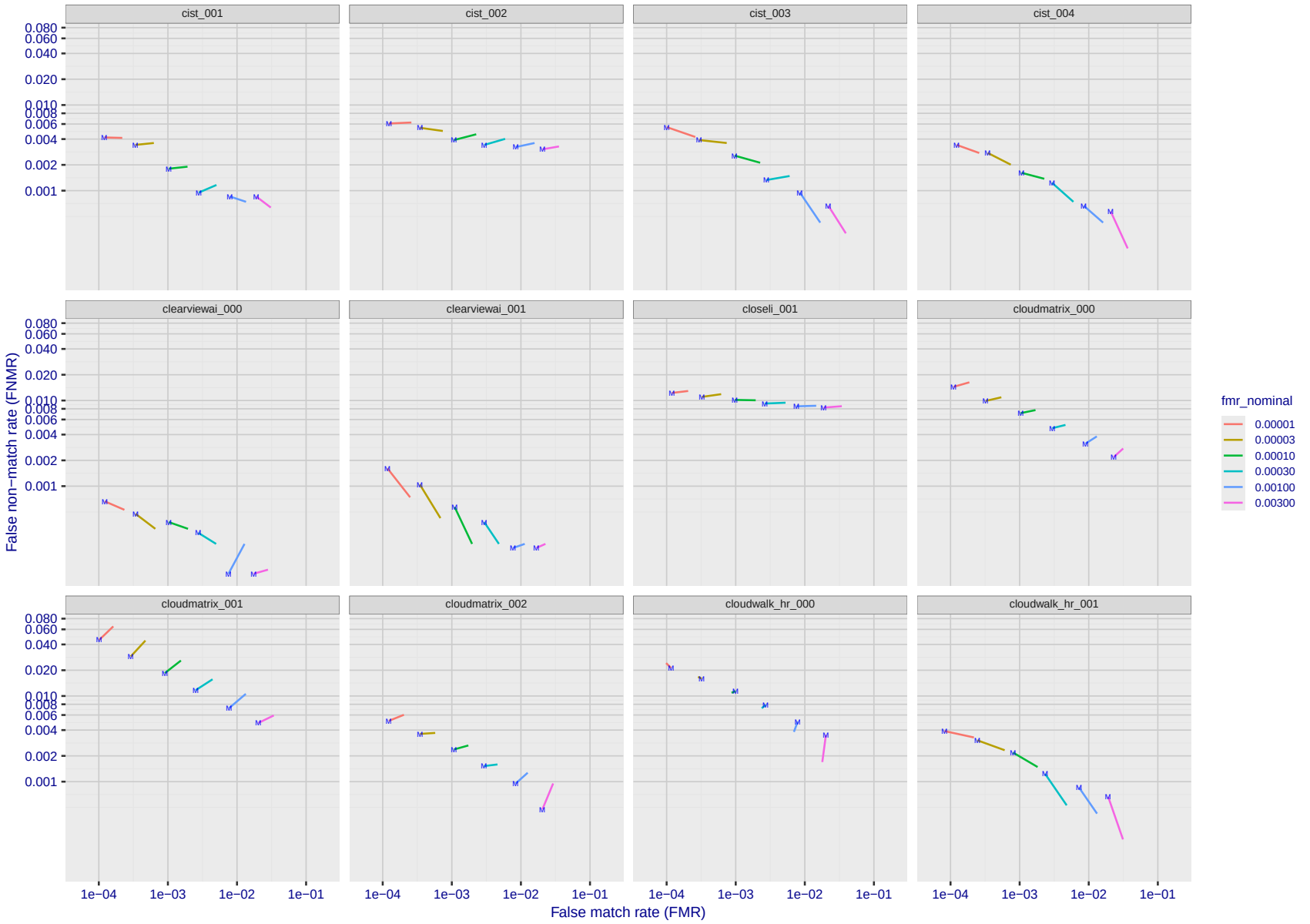

Figure 455: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

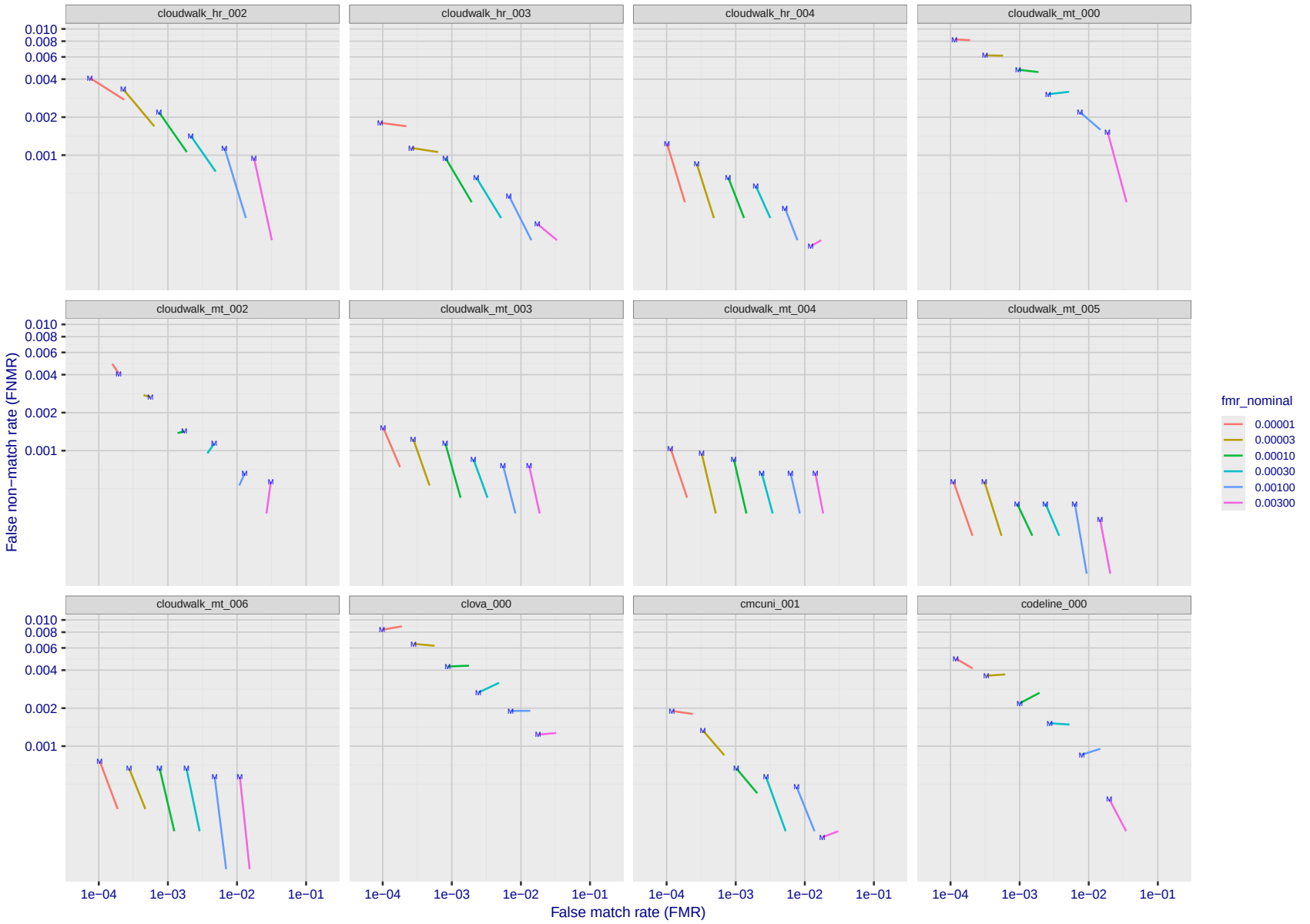

Figure 456: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

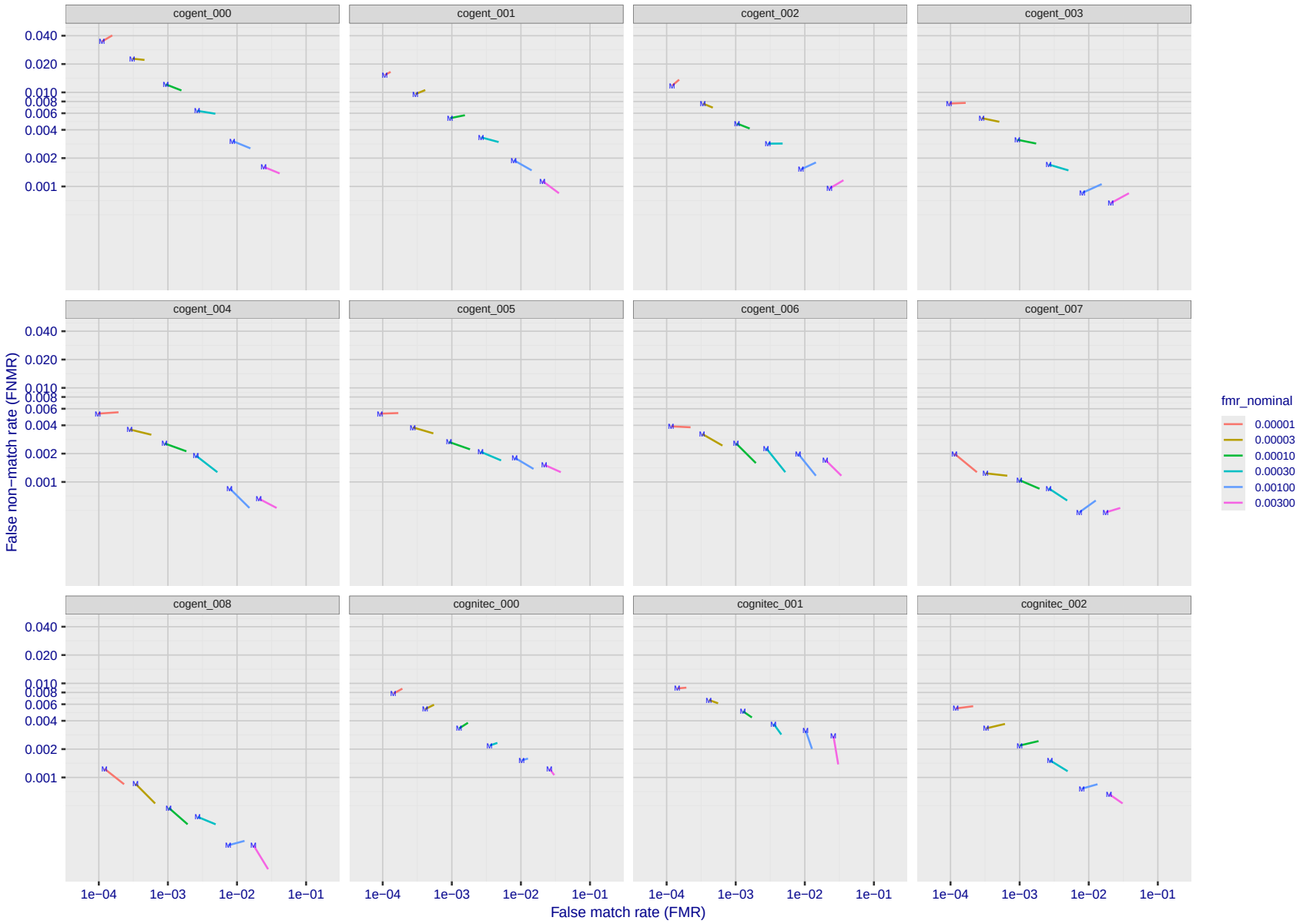

Figure 457: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

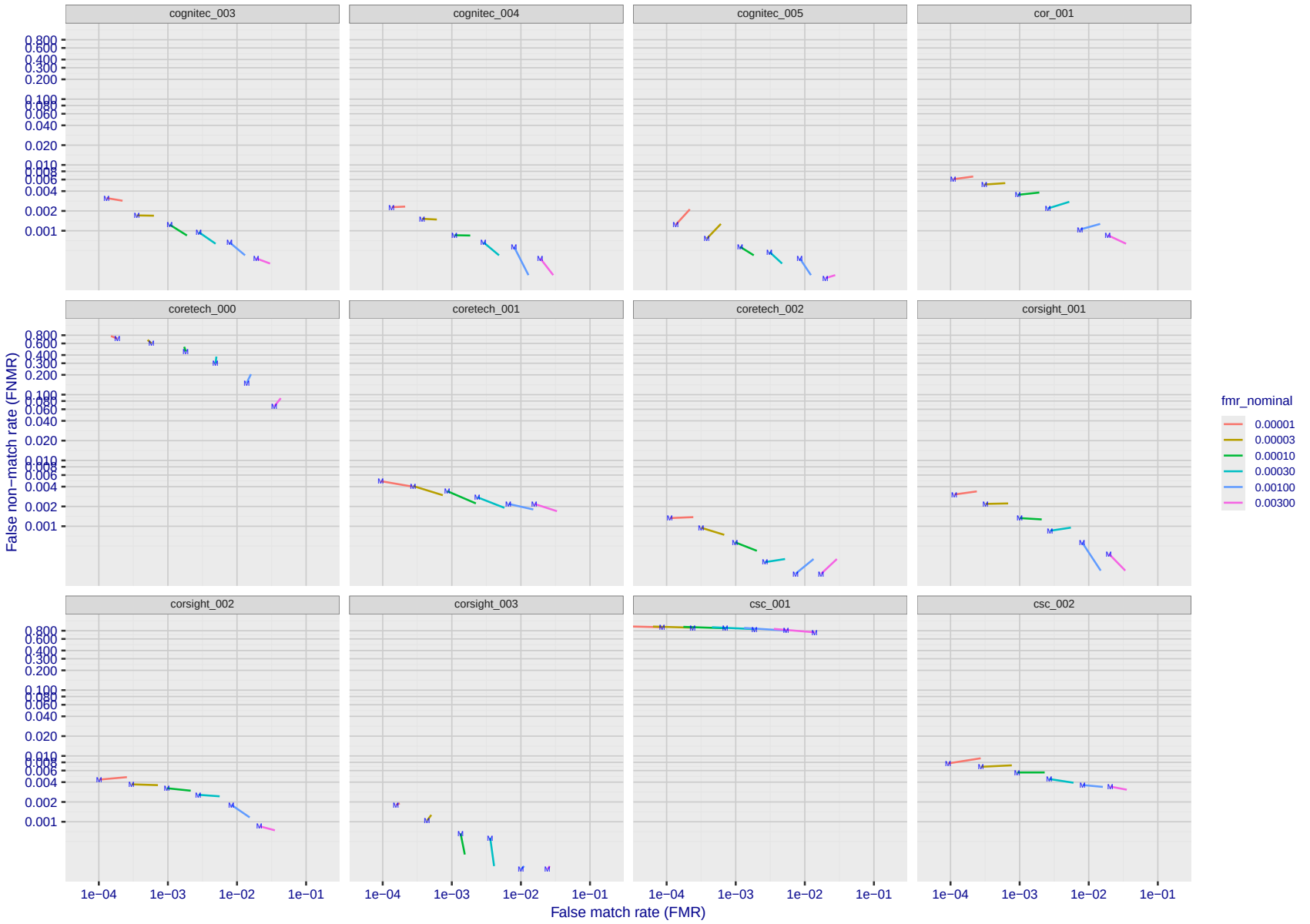

Figure 458: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

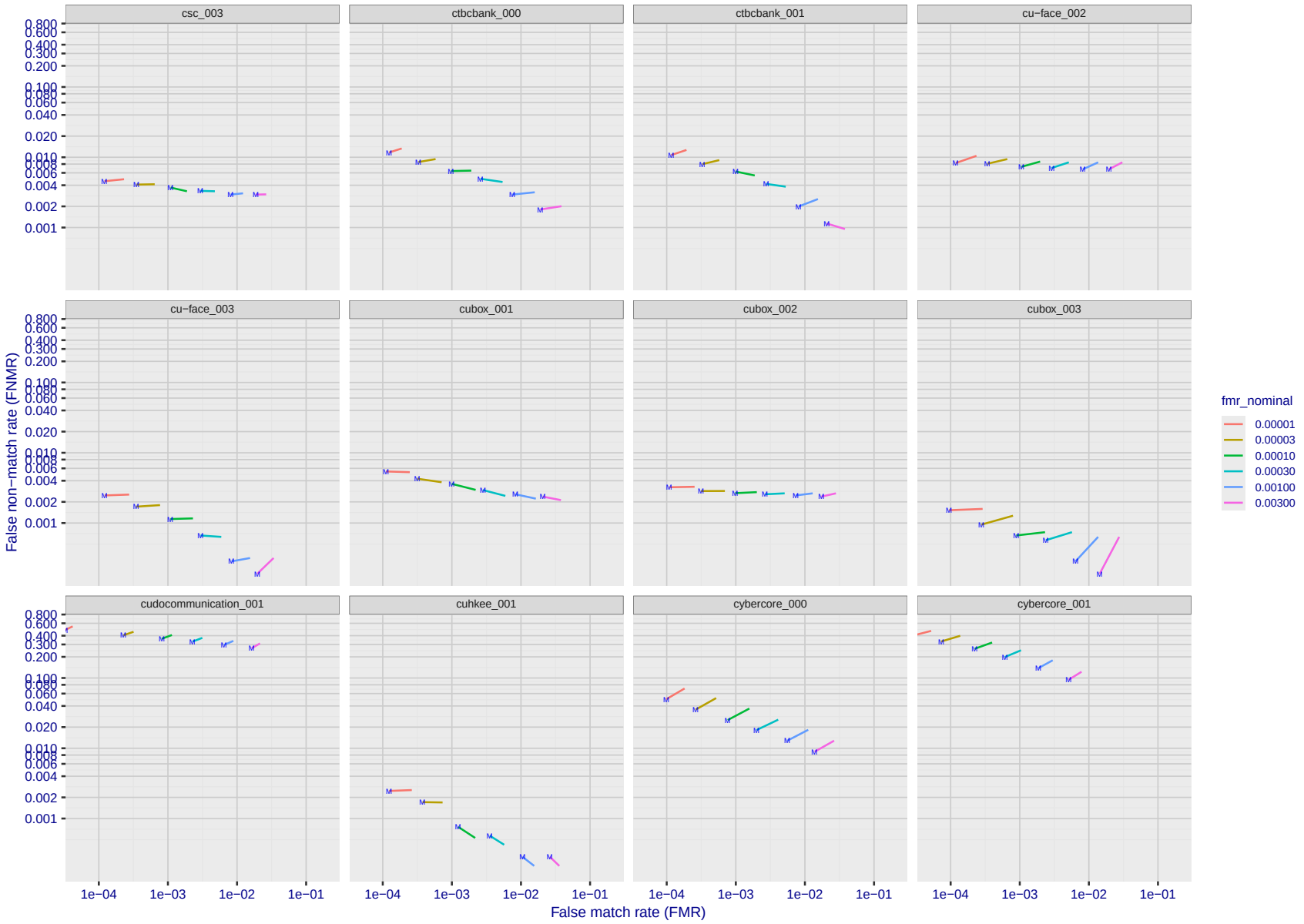

Figure 459: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

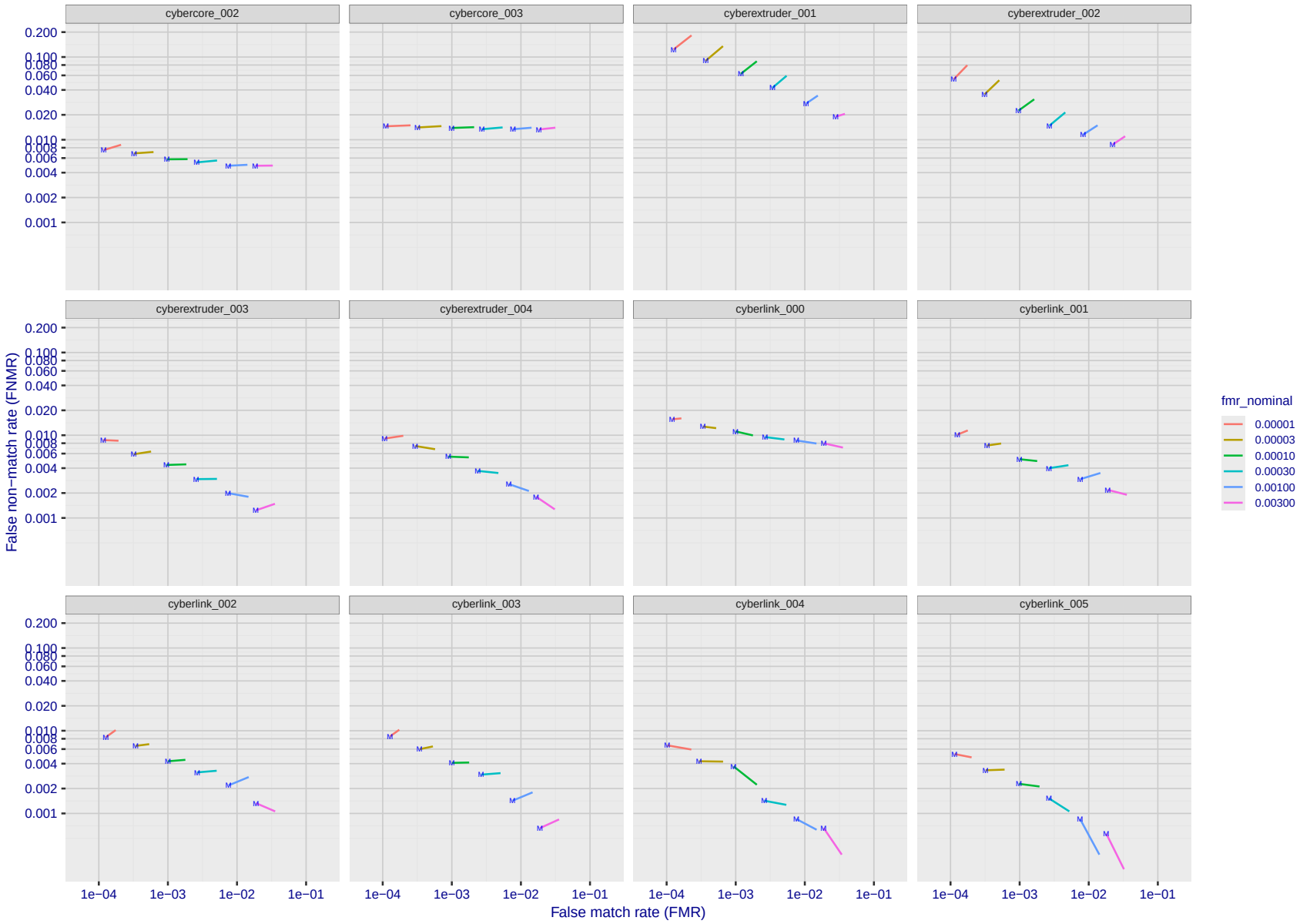

Figure 460: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

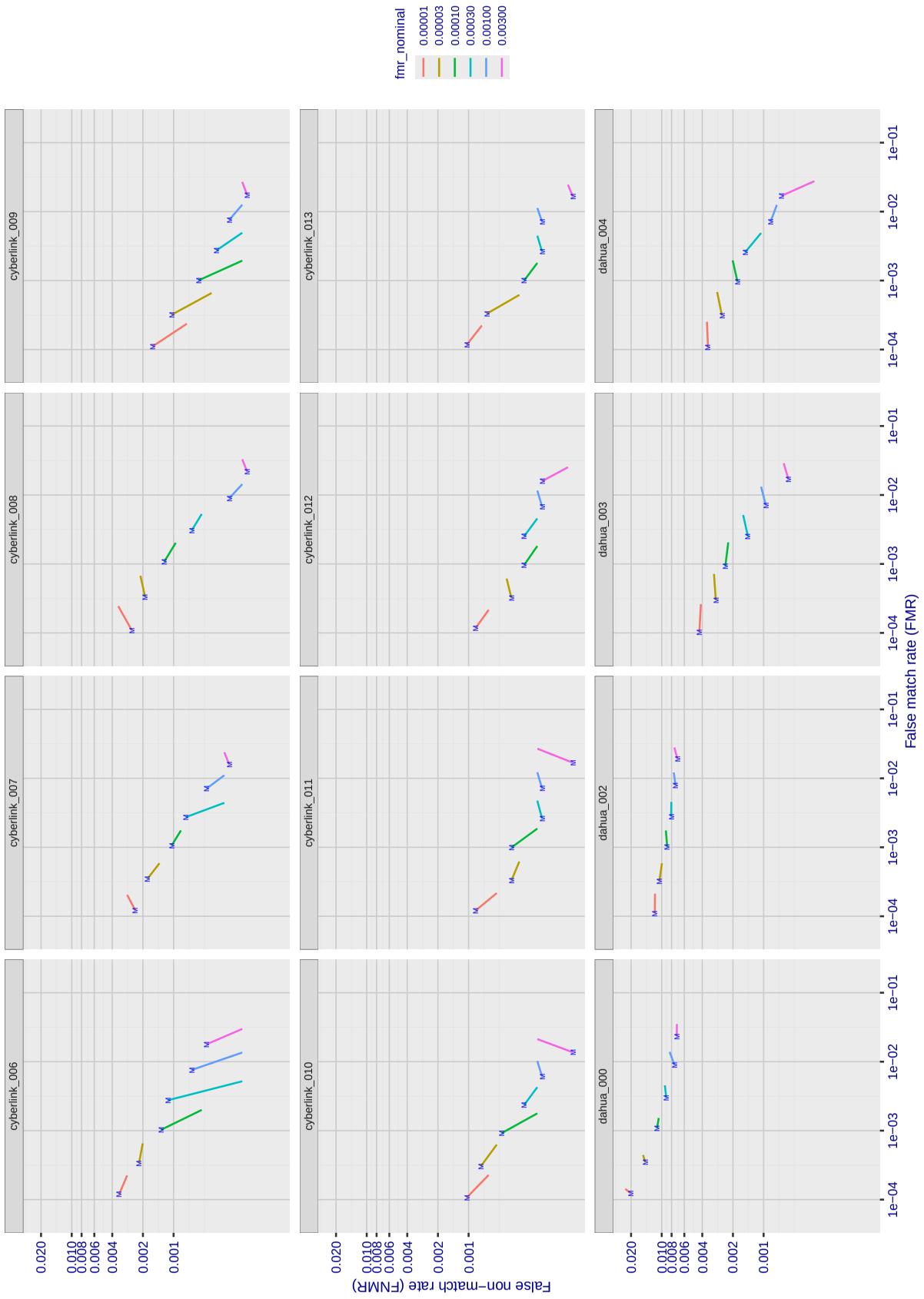

Figure 461: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

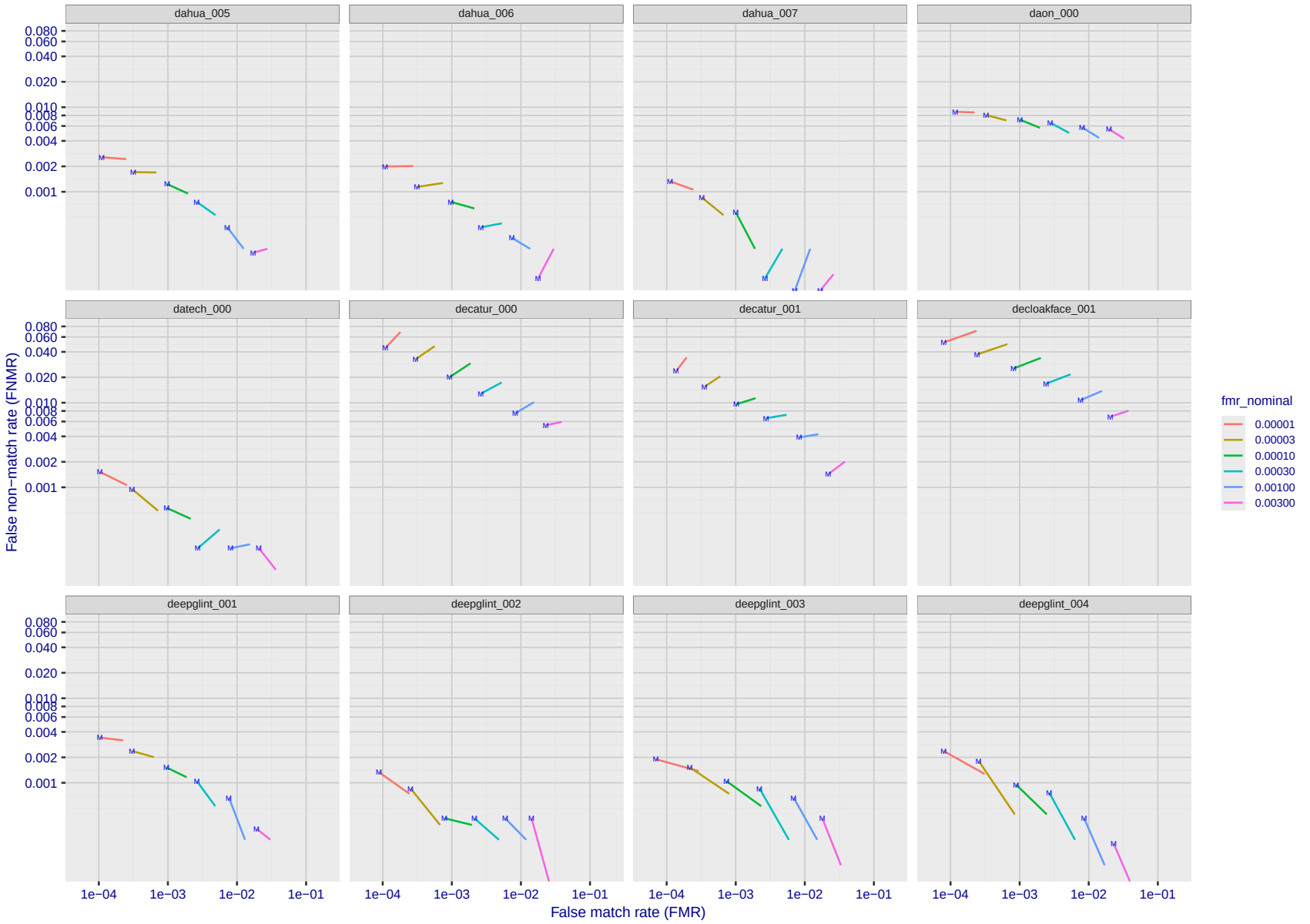

Figure 462: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

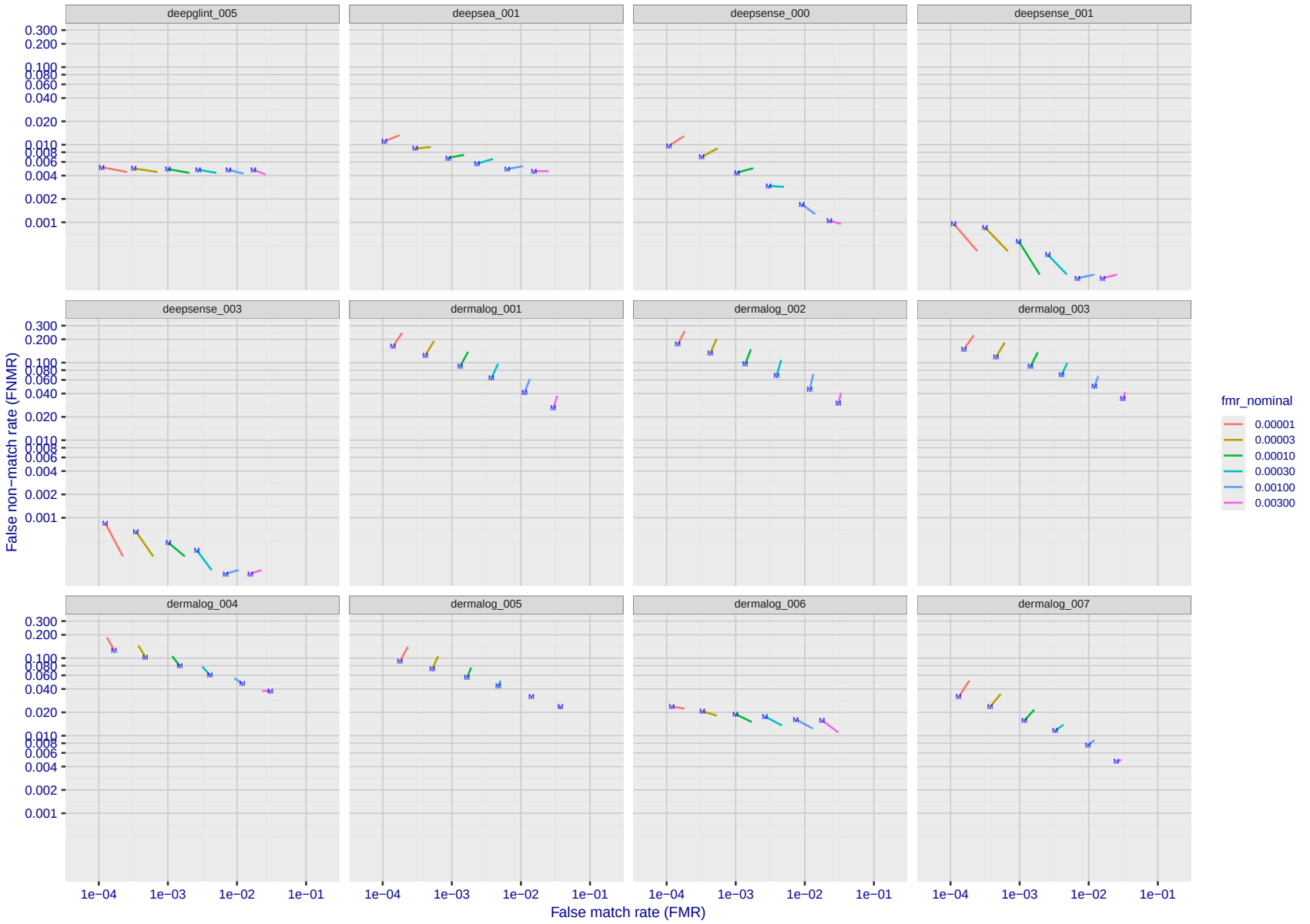

Figure 463: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

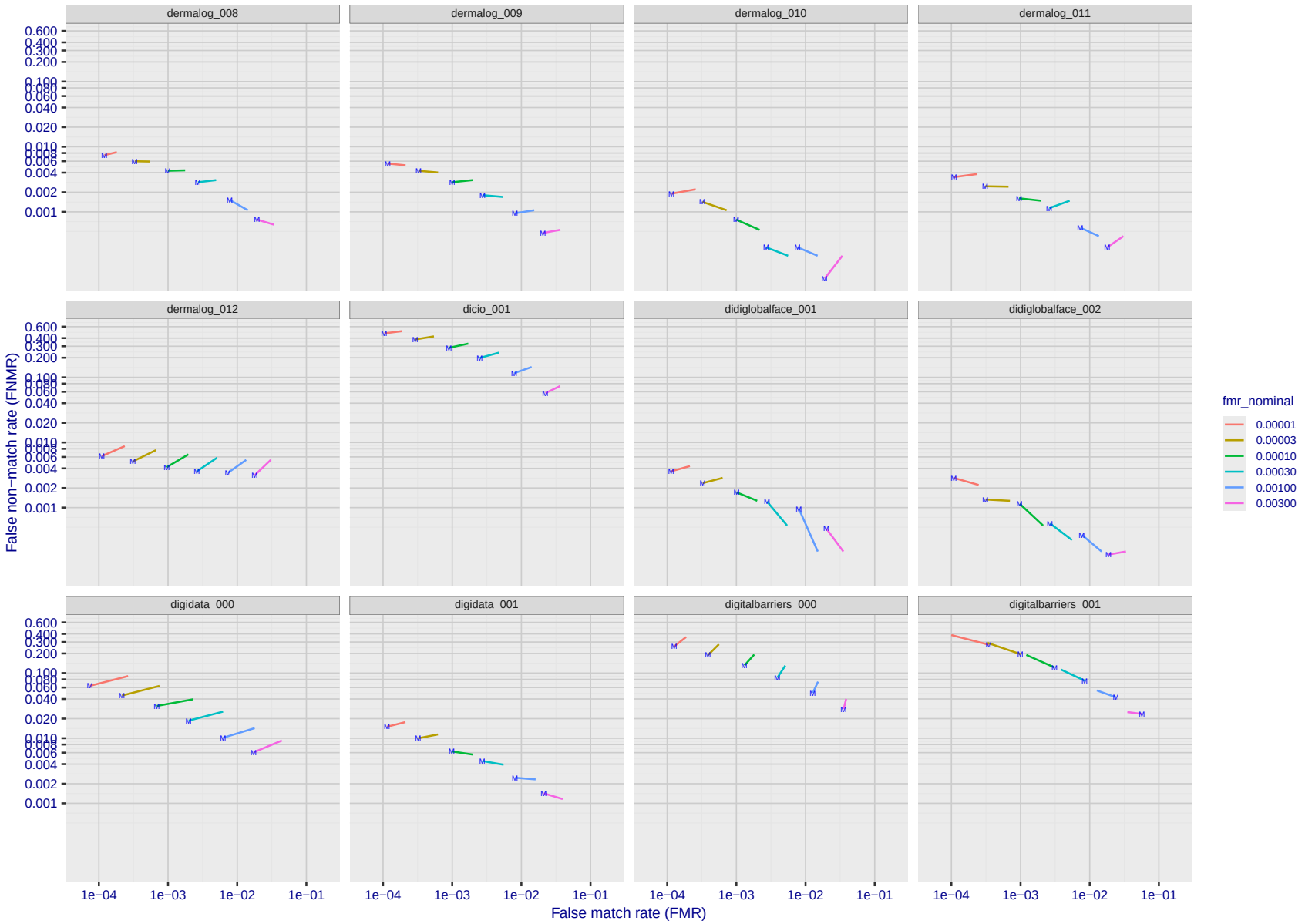

Figure 464: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

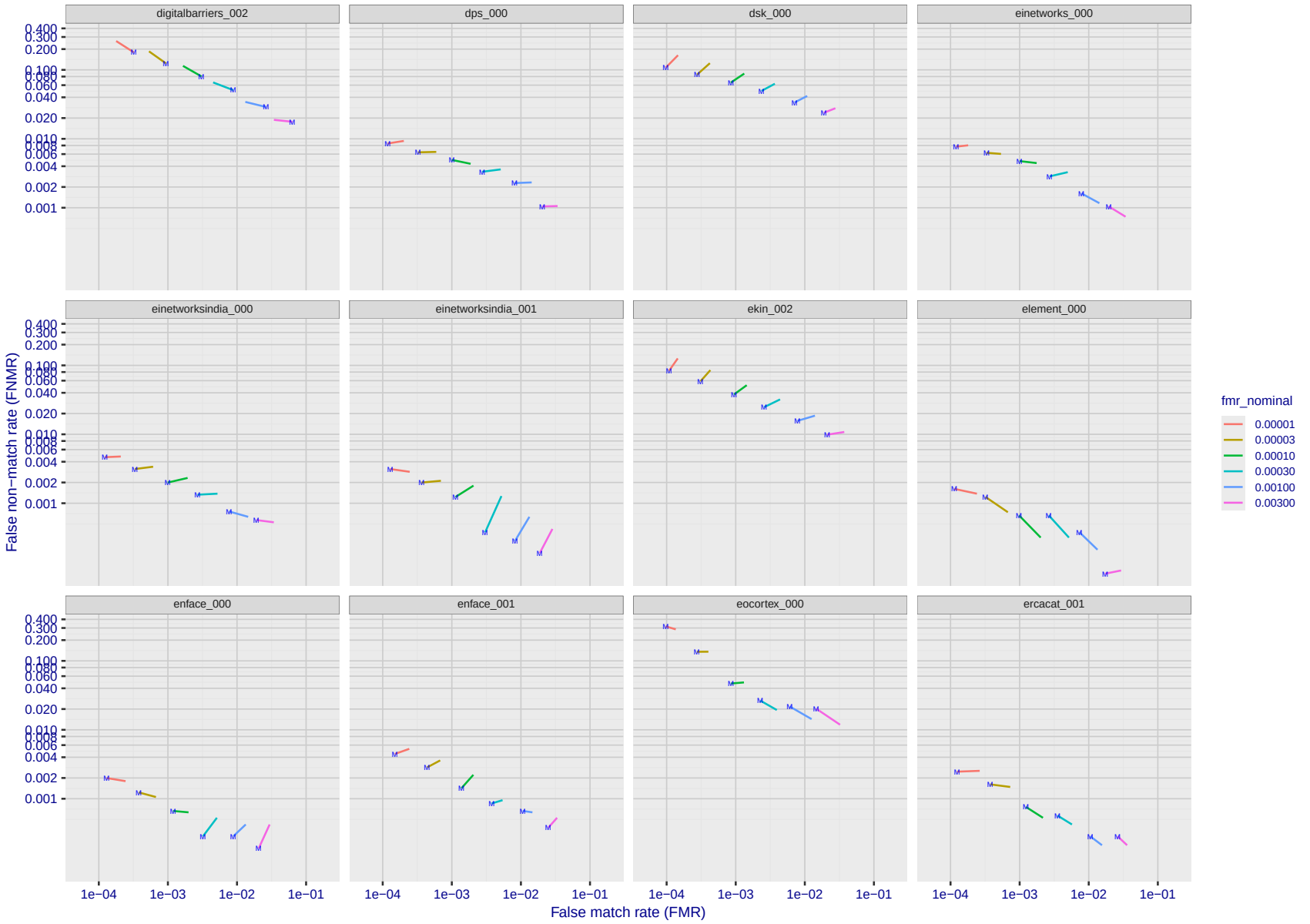

Figure 465: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

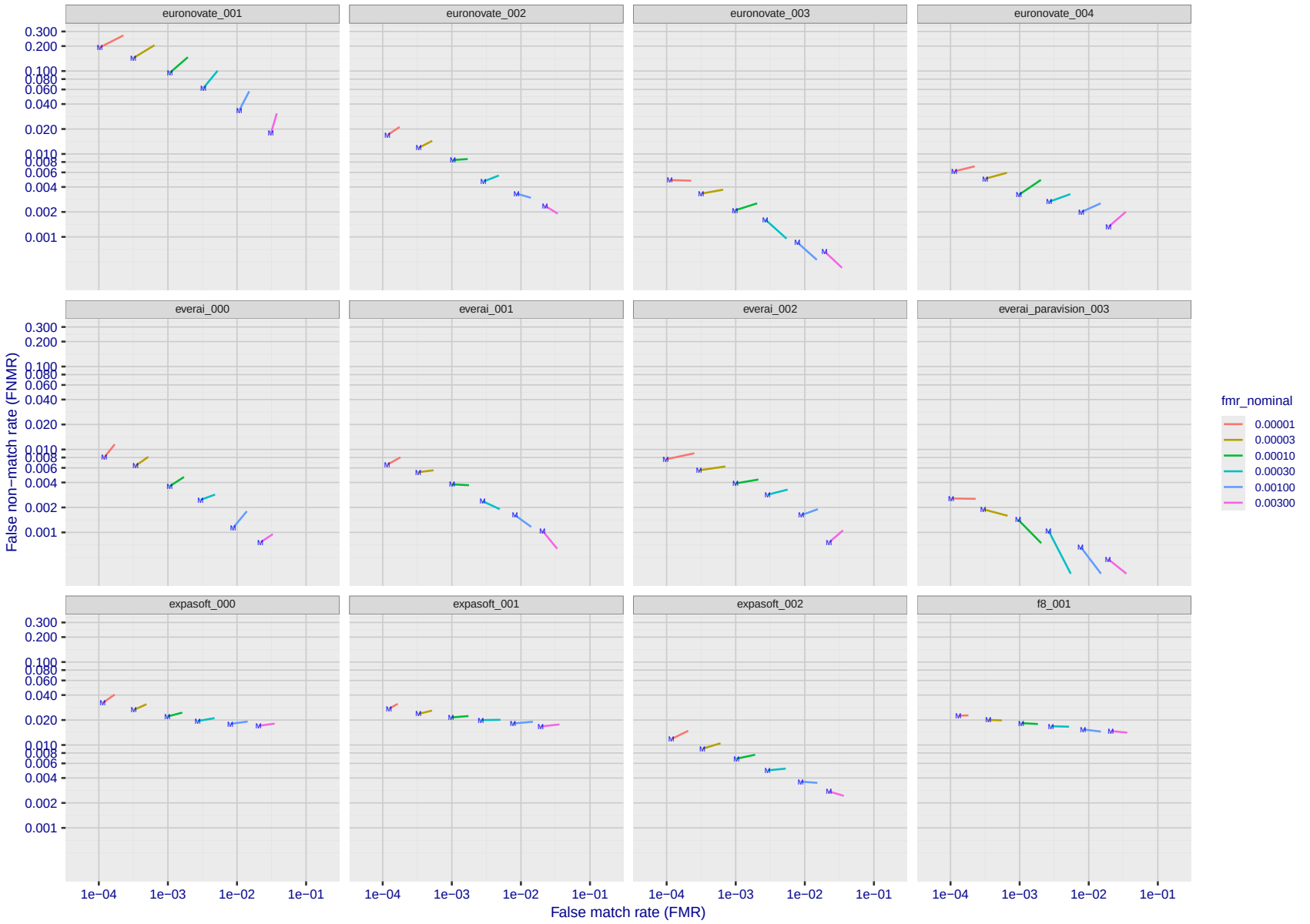

Figure 466: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

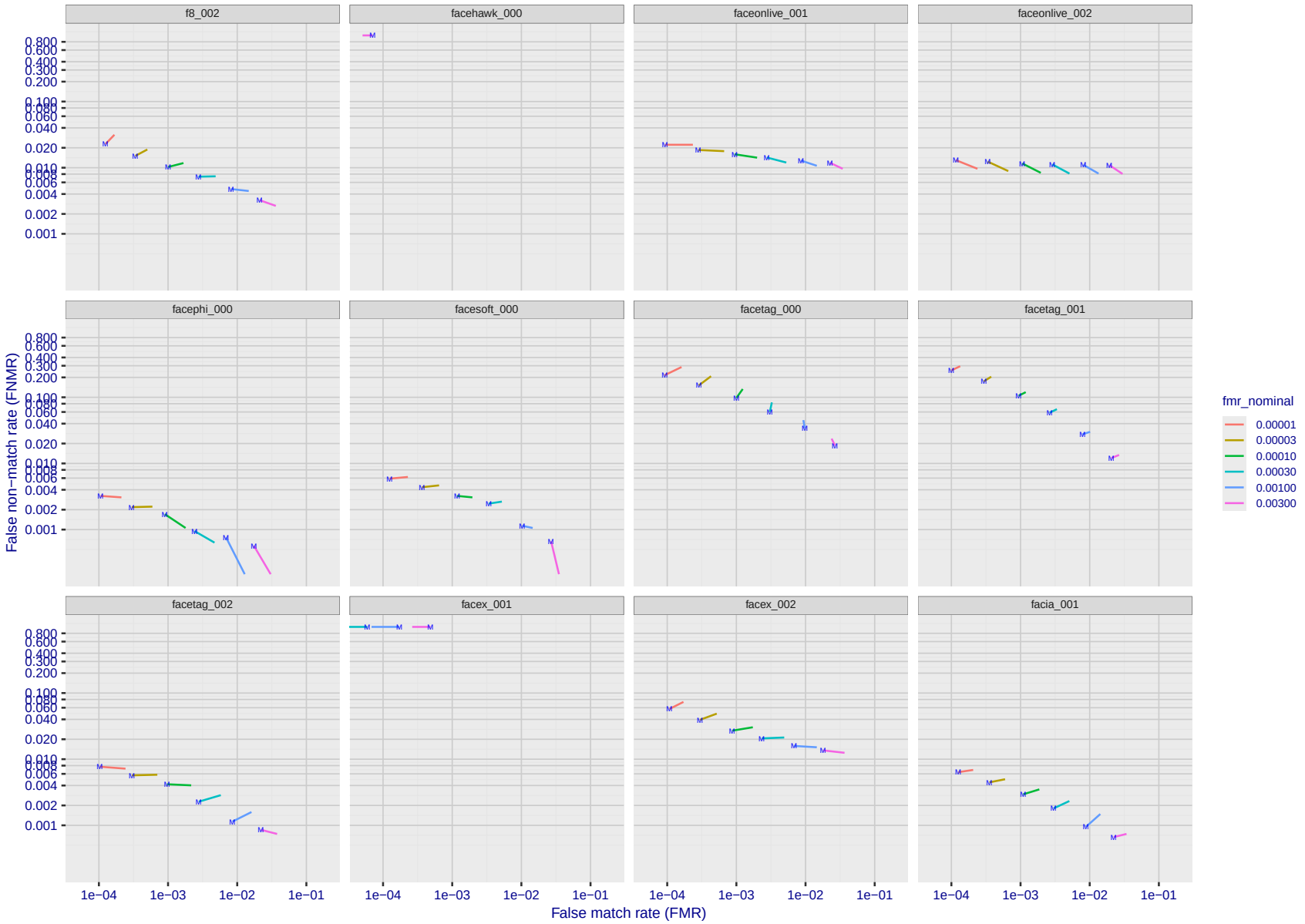

Figure 467: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

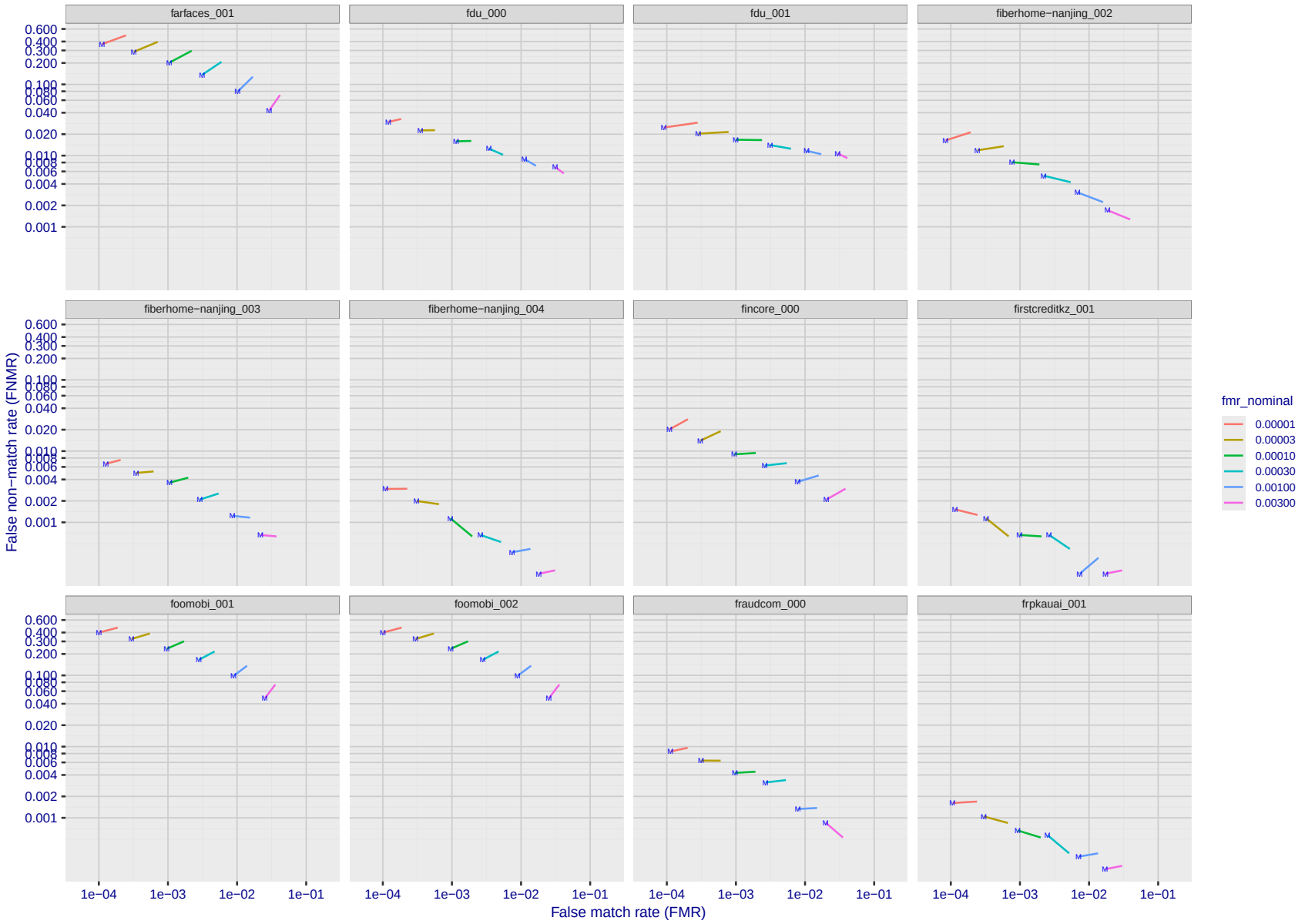

Figure 468: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

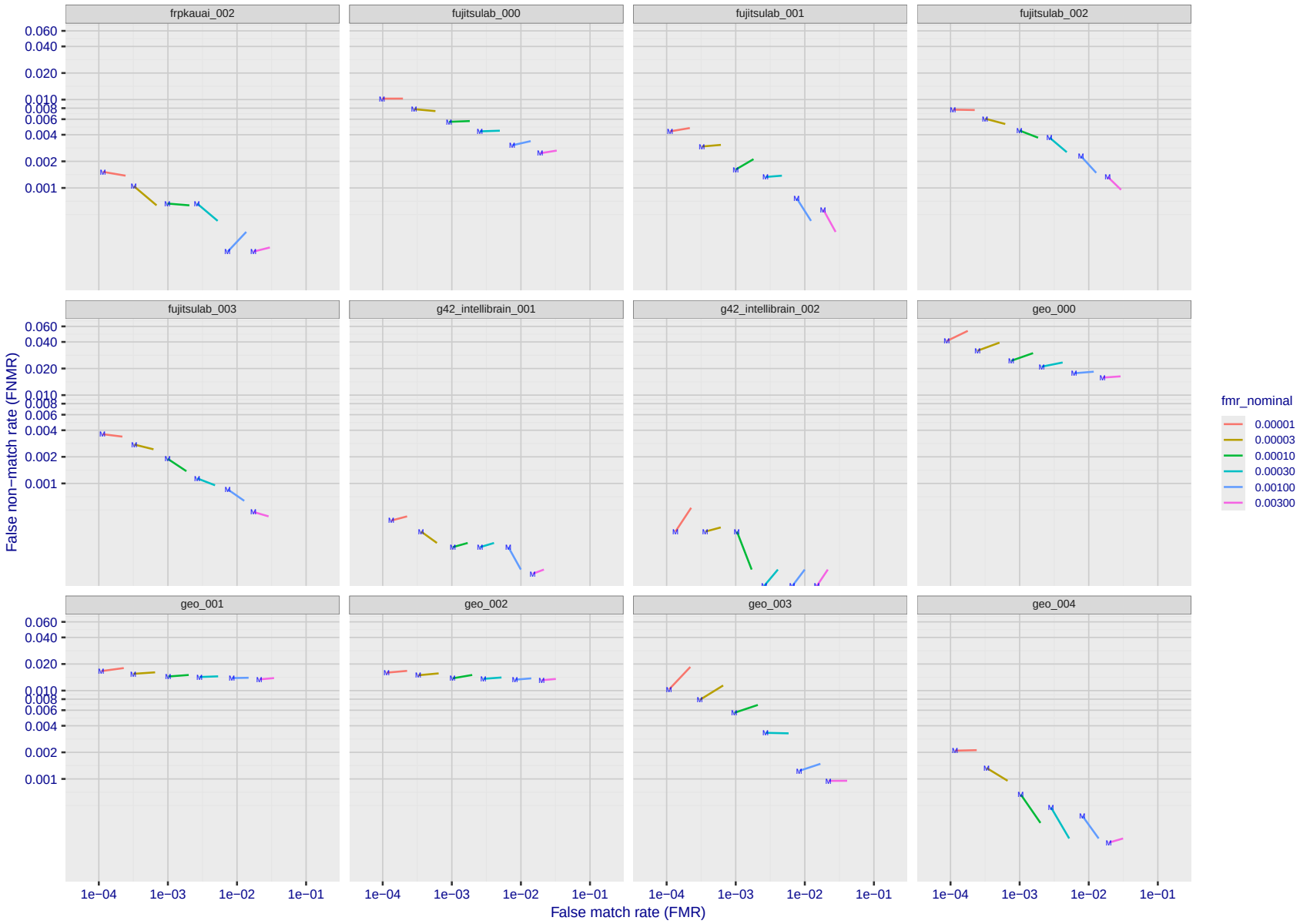

Figure 469: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

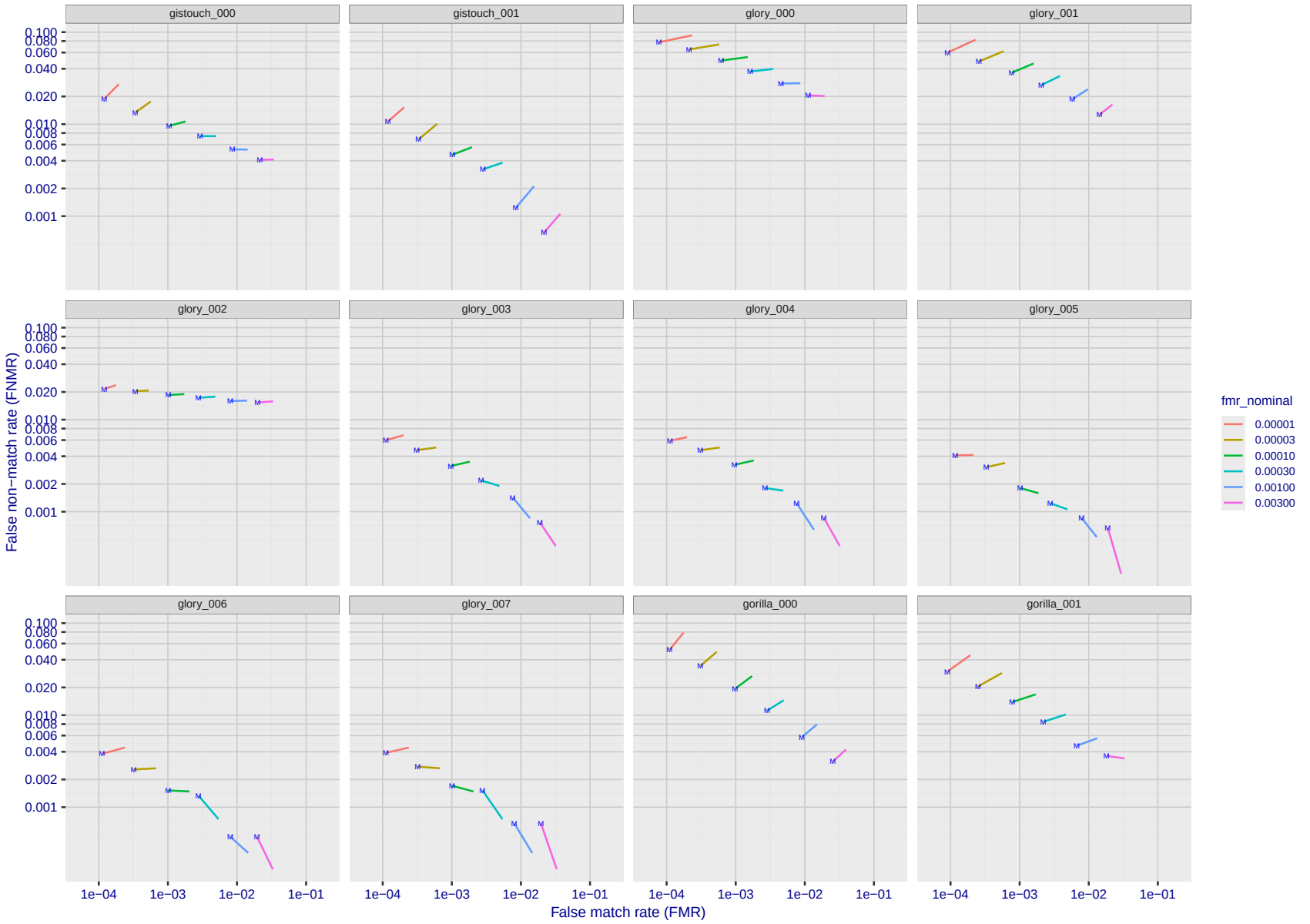

Figure 470: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

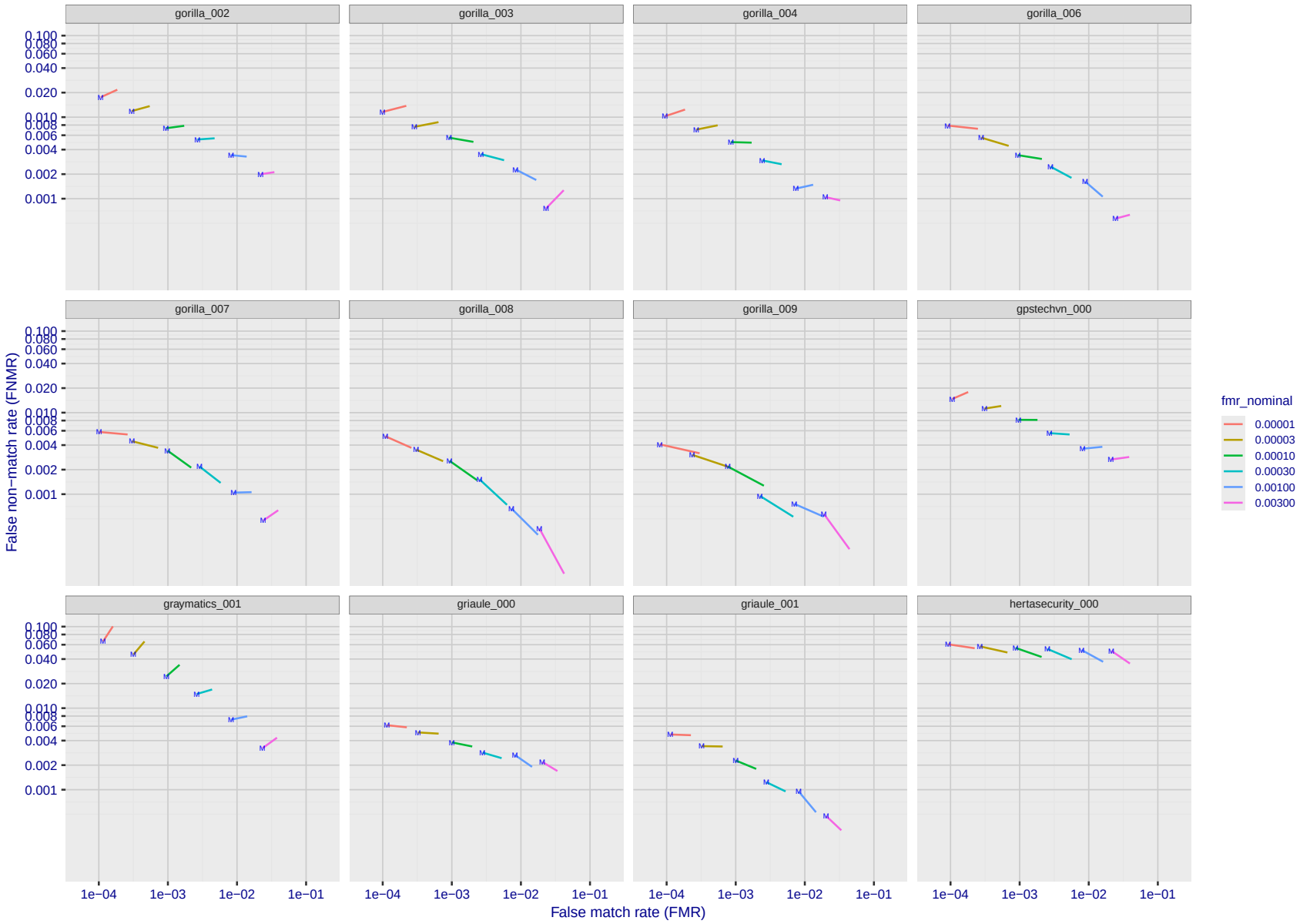

Figure 471: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

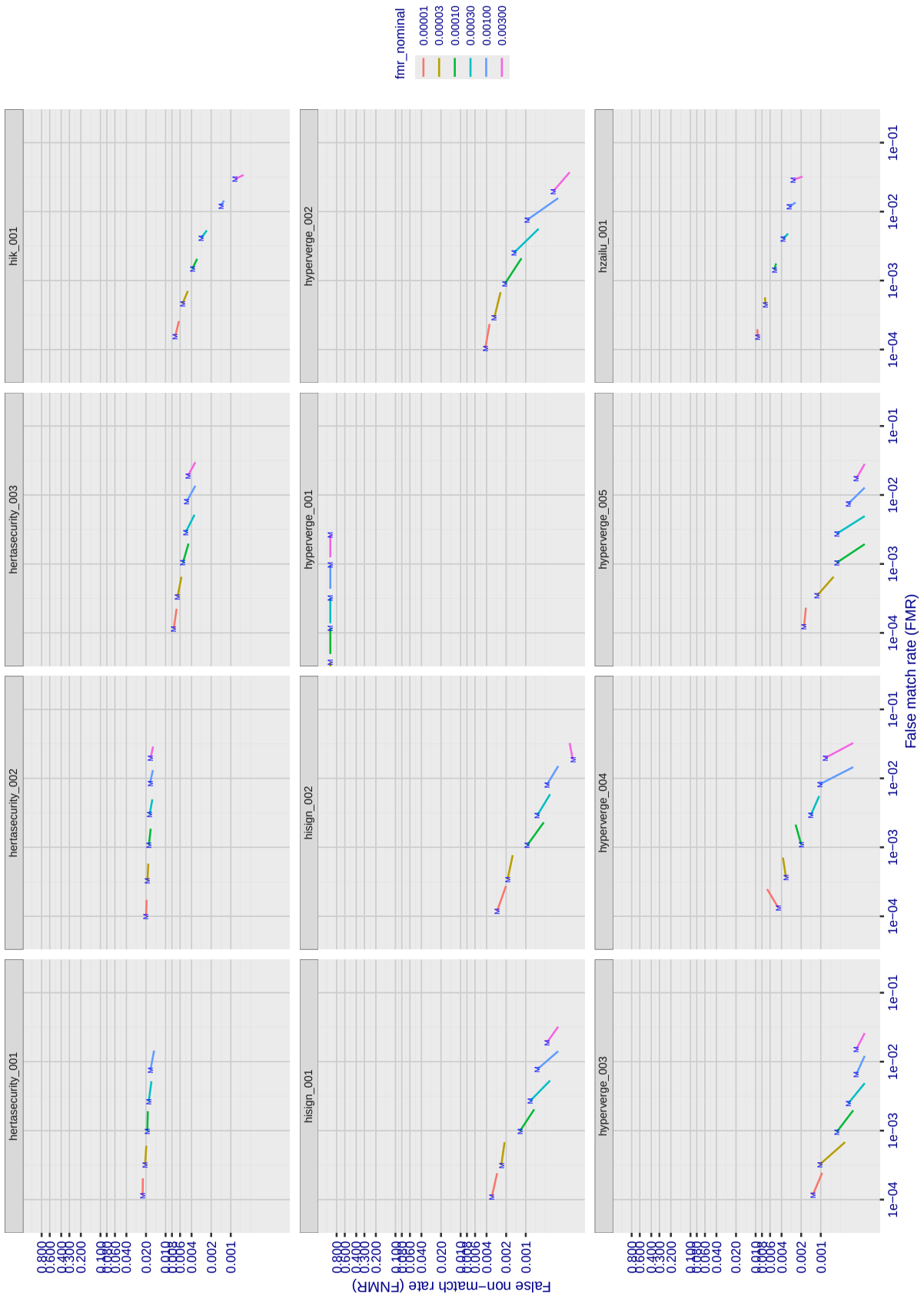

Figure 472: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

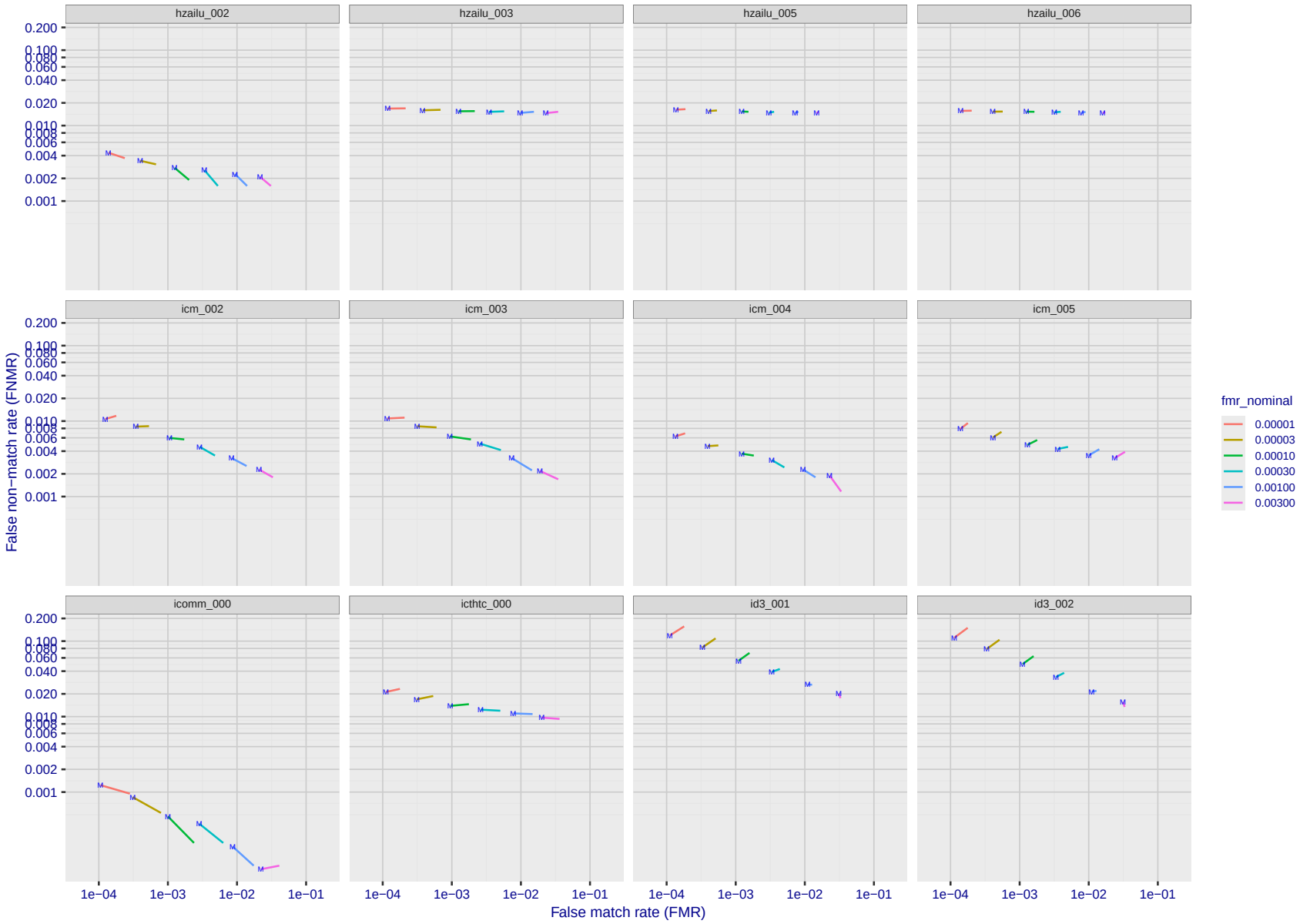

Figure 473: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

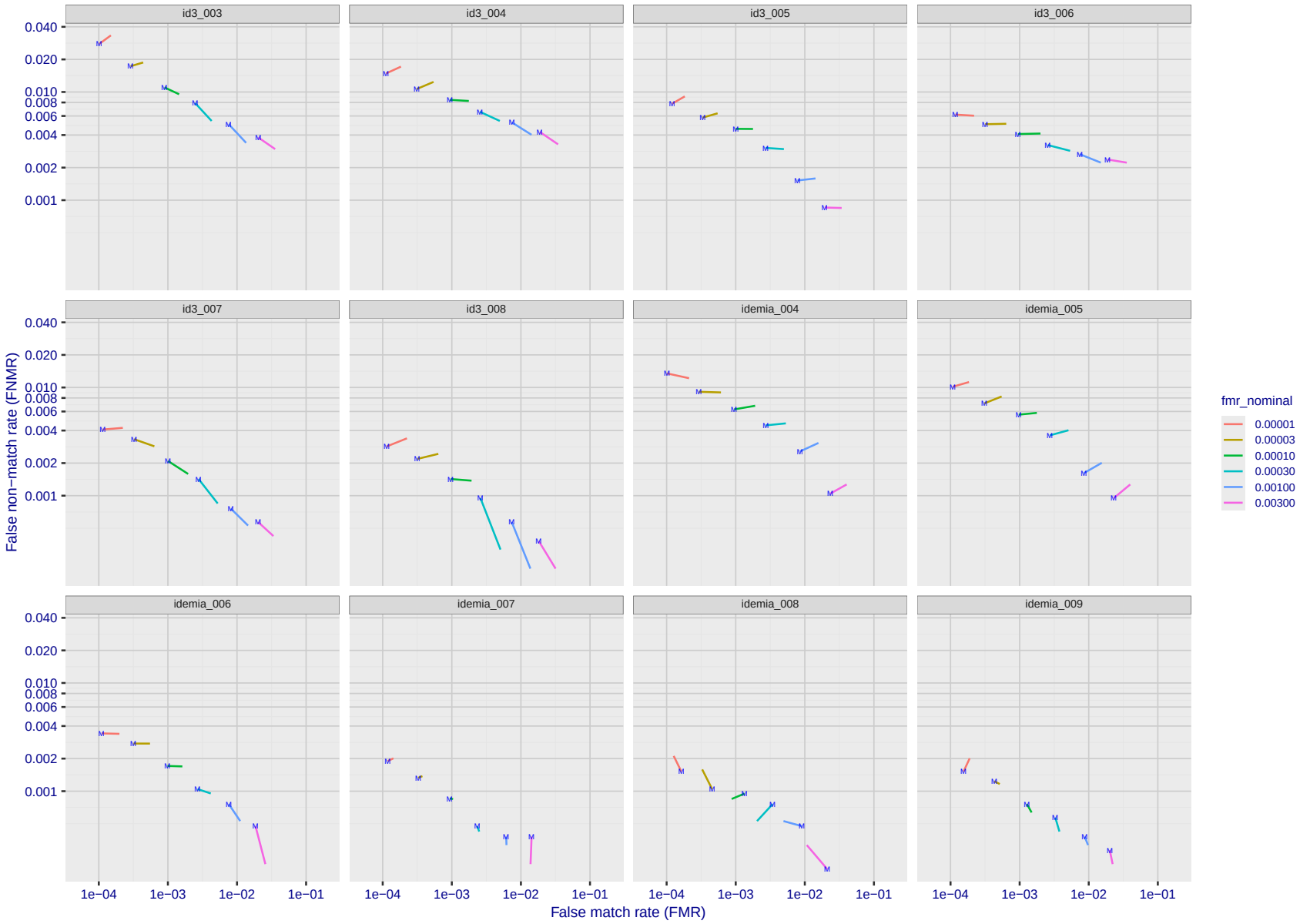

Figure 474: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

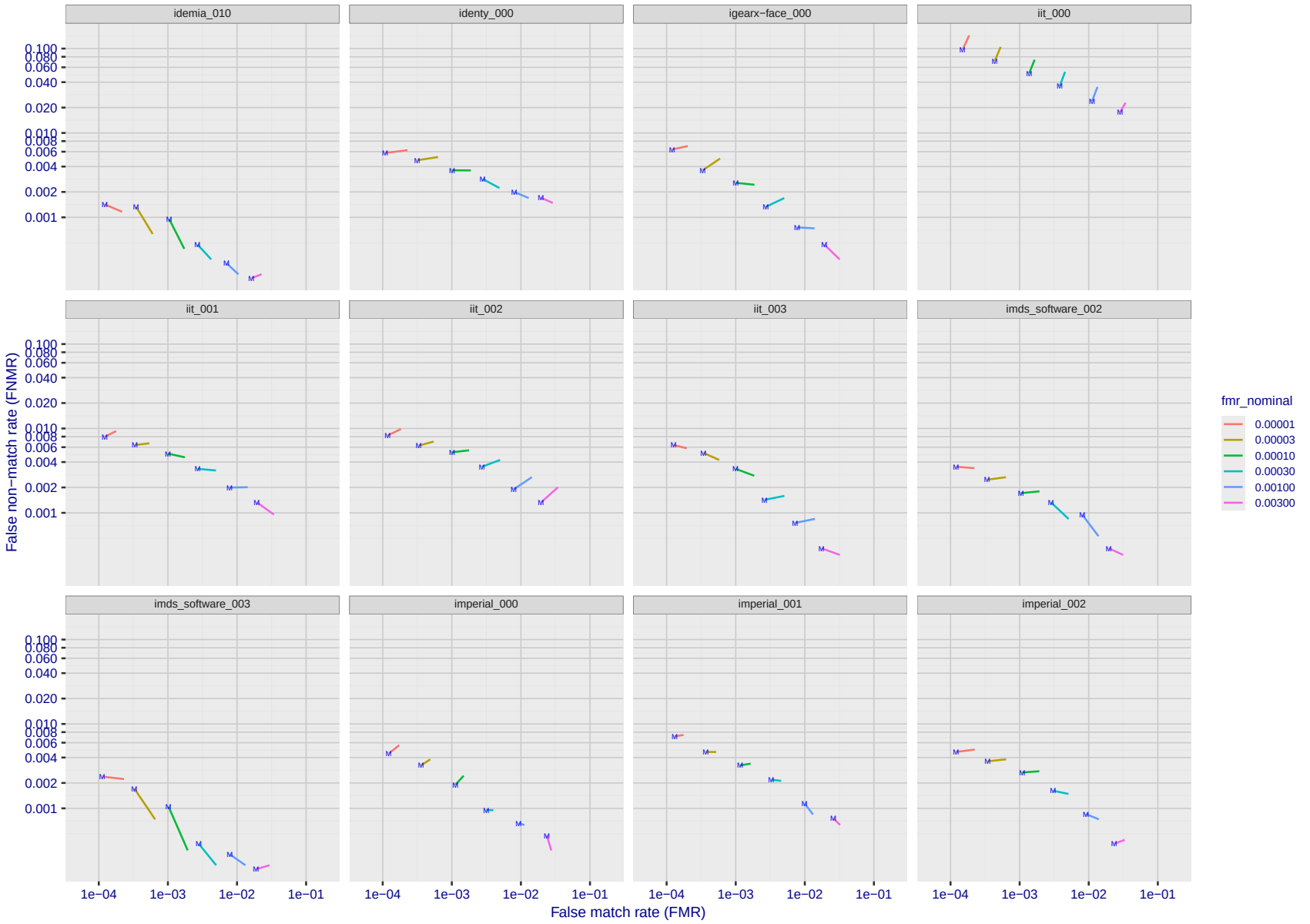

Figure 475: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

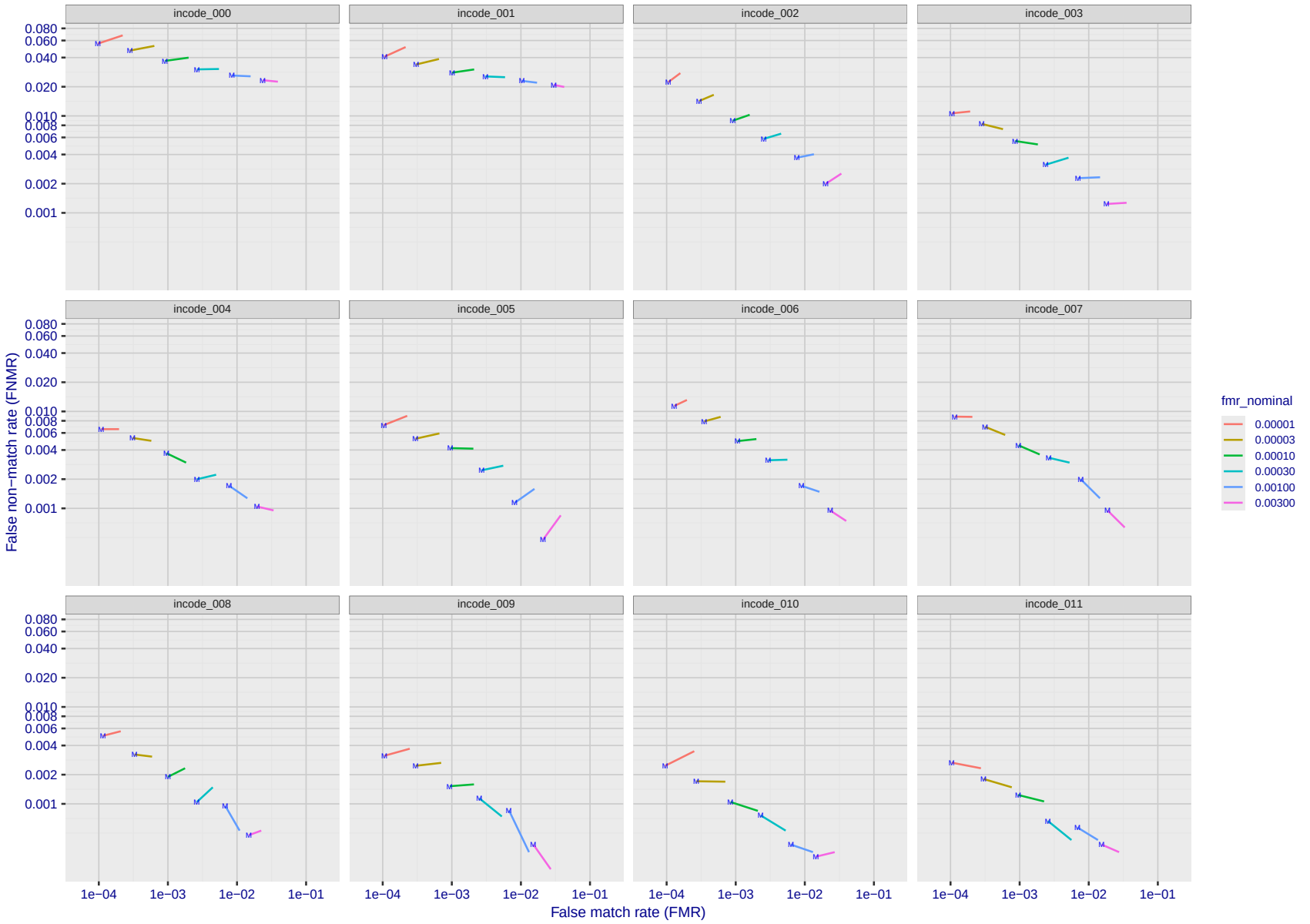

Figure 476: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

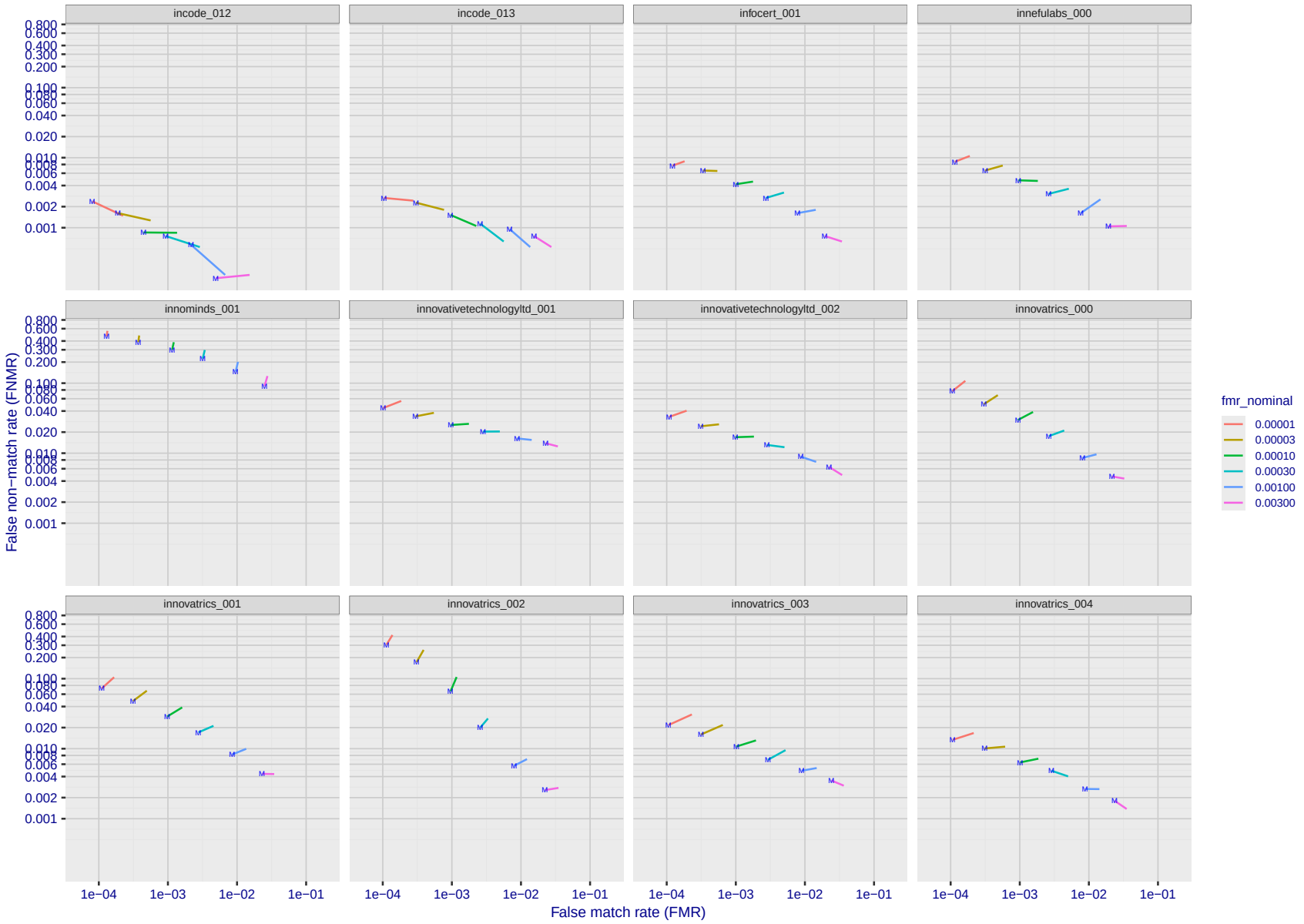

Figure 477: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

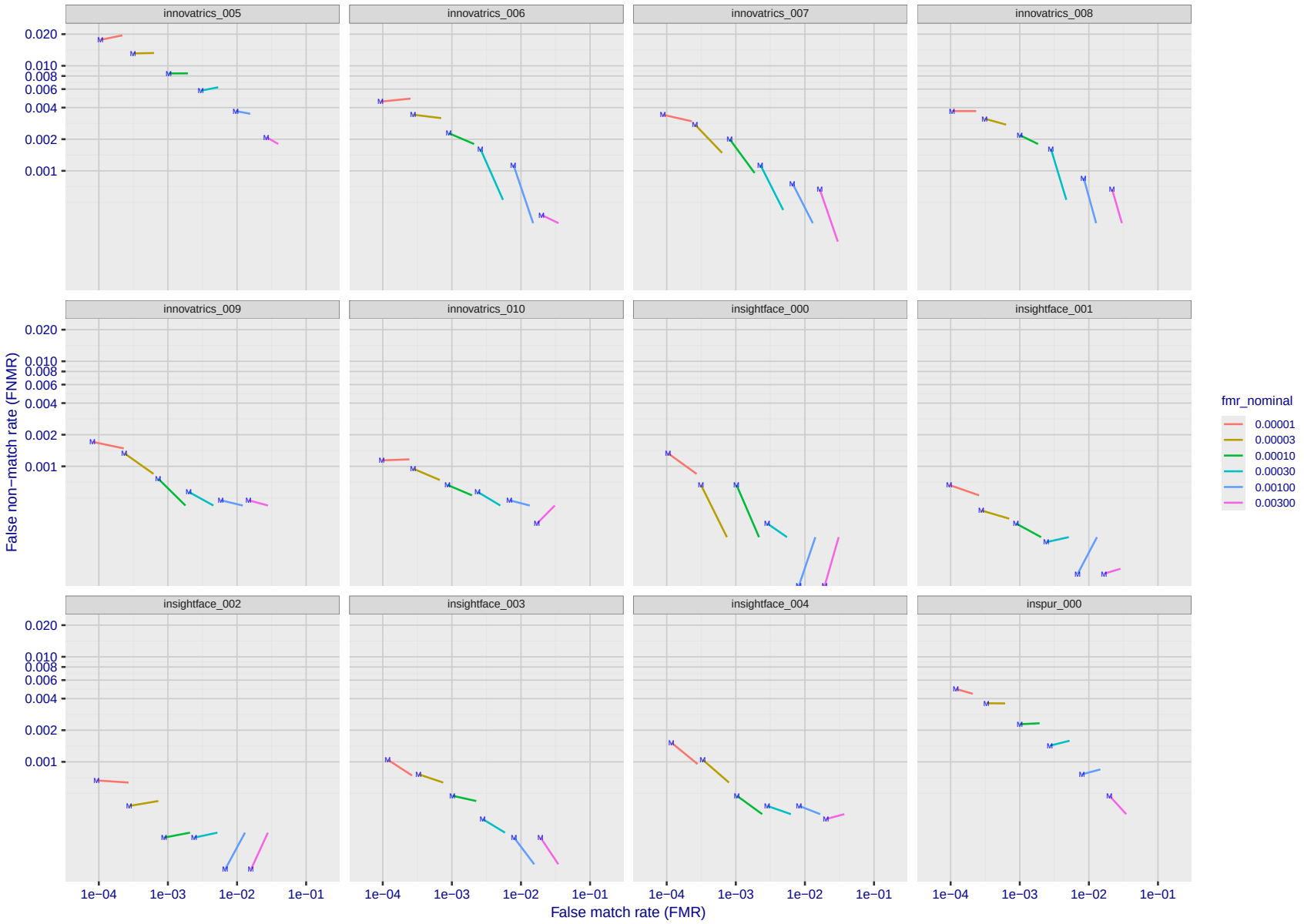

Figure 478: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

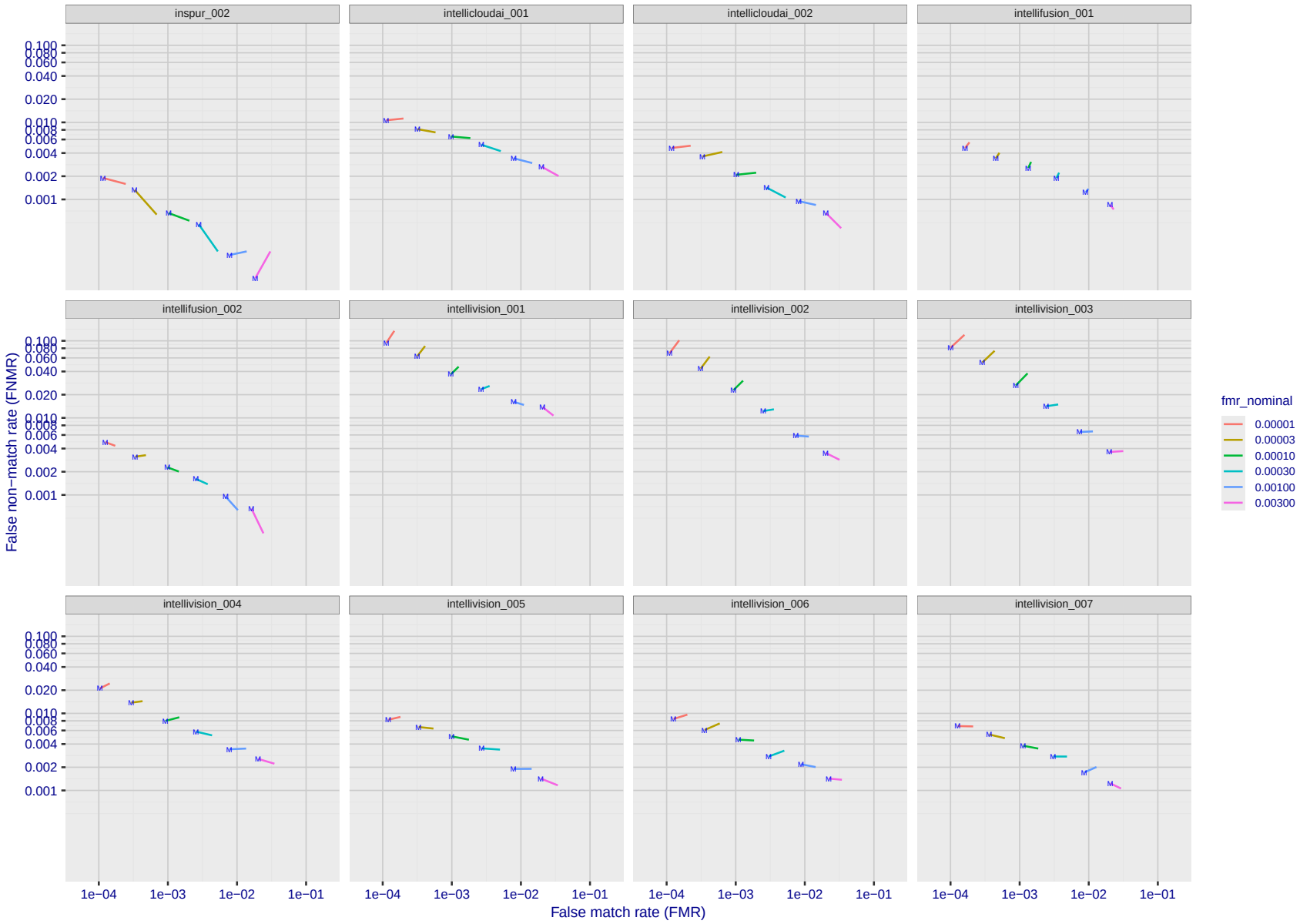

Figure 479: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

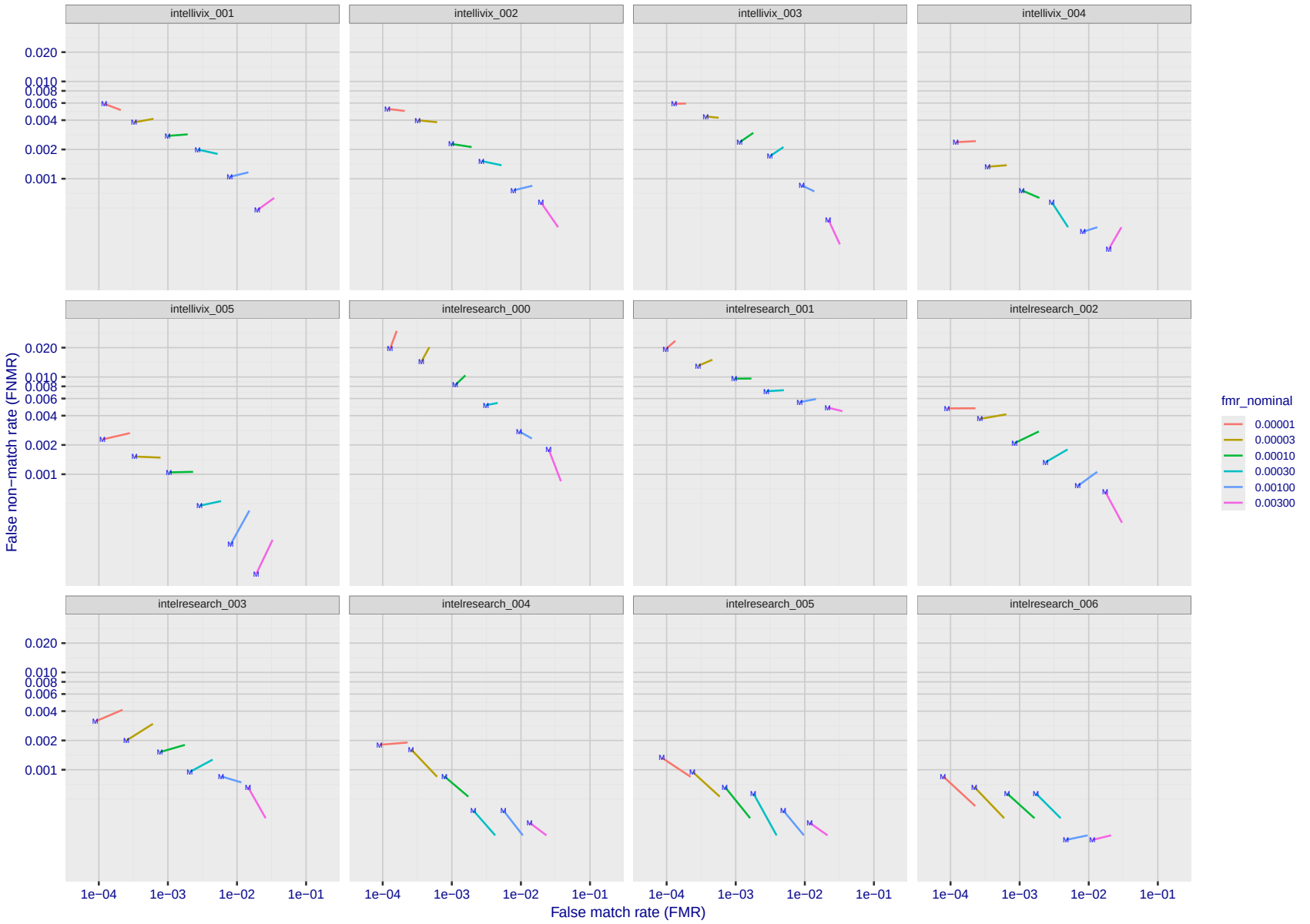

Figure 480: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

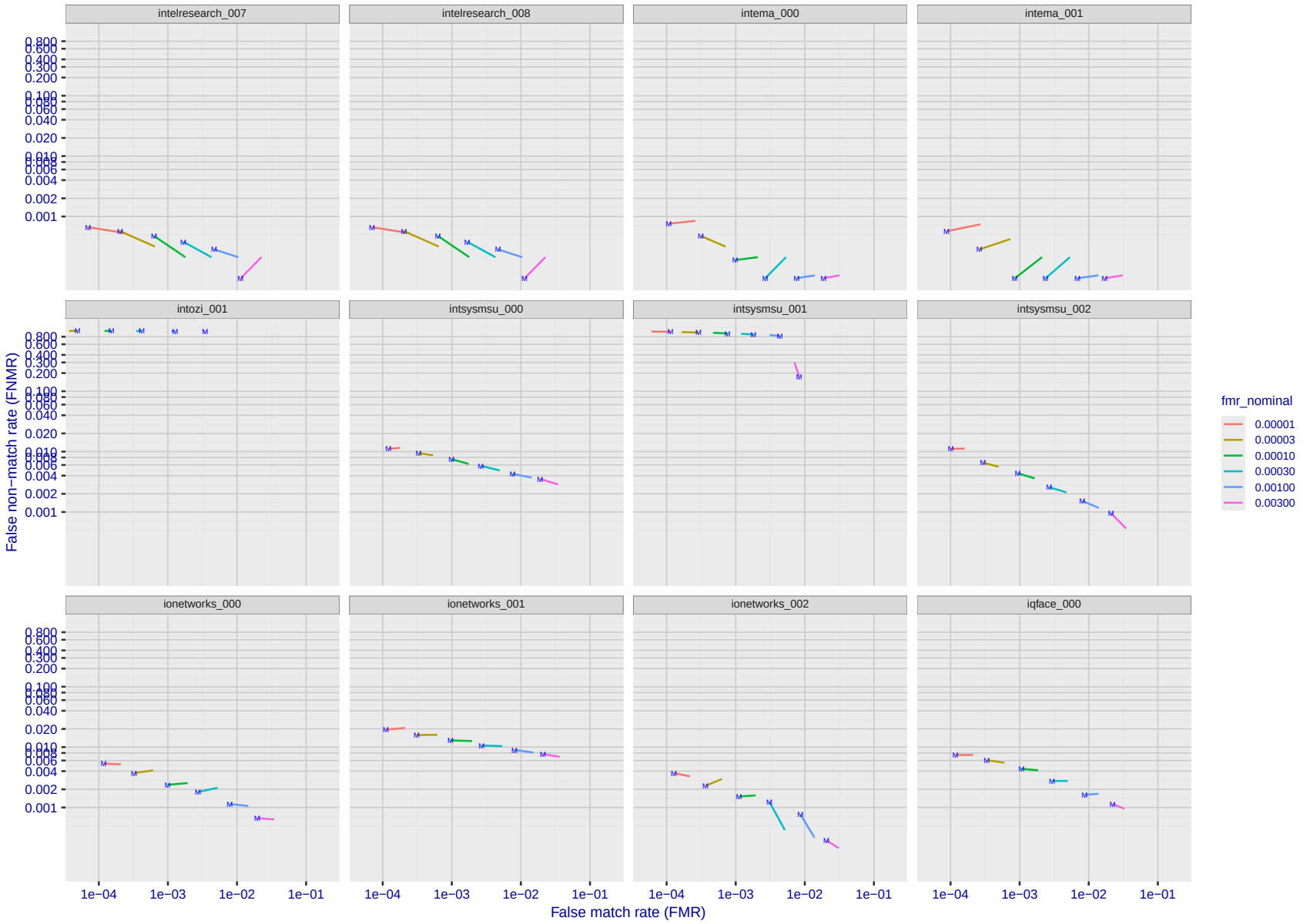

Figure 481: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

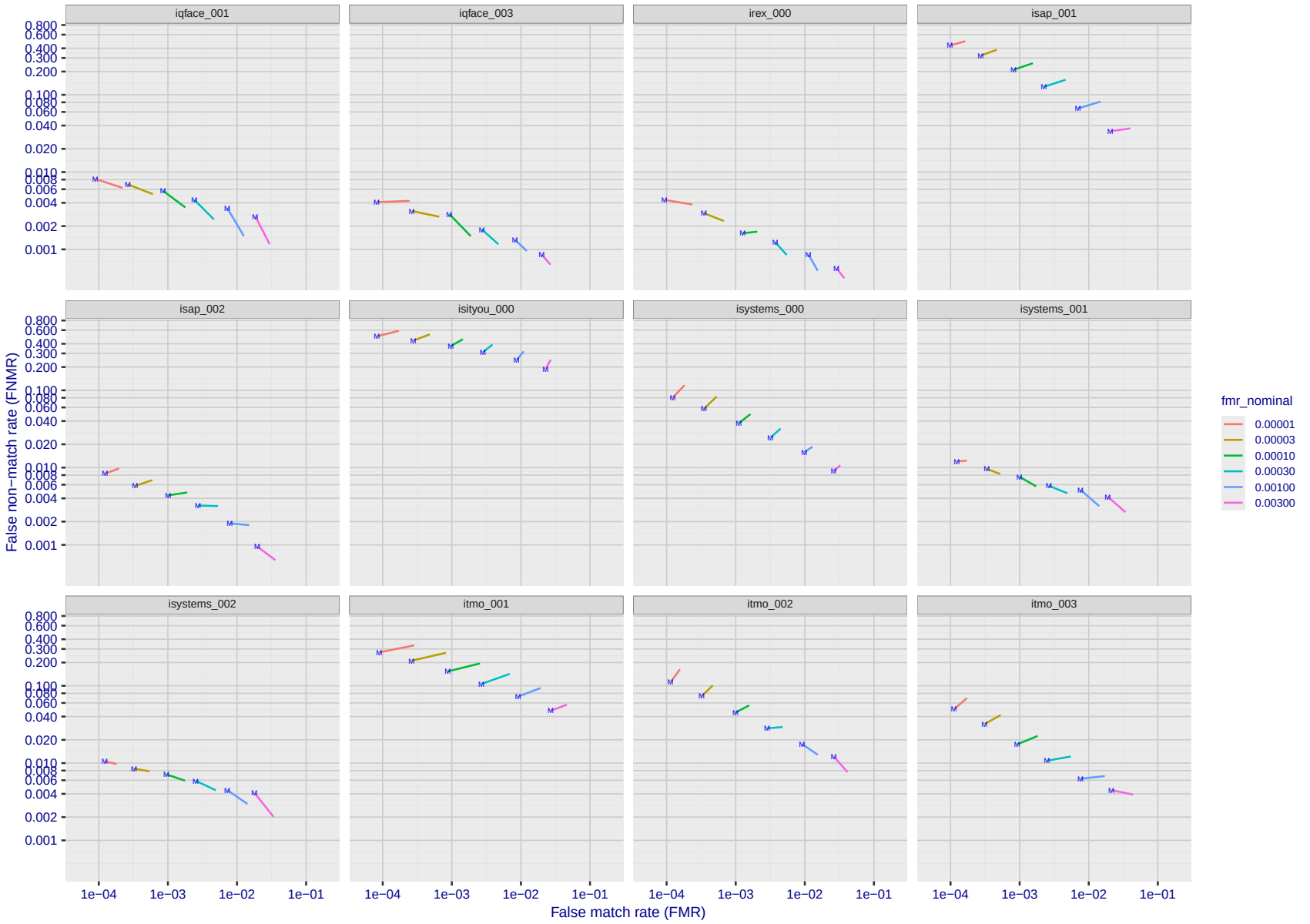

Figure 482: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

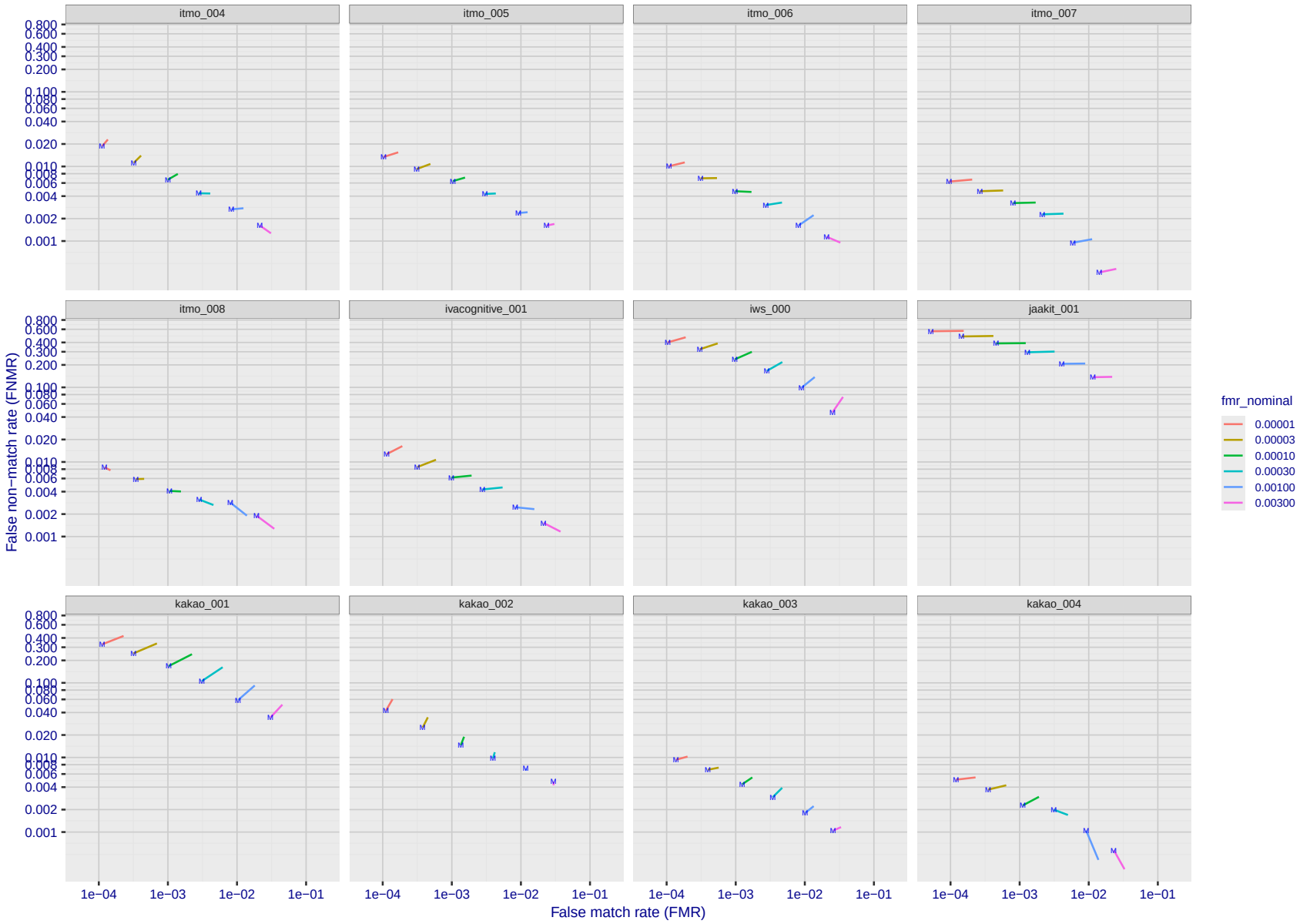

Figure 483: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

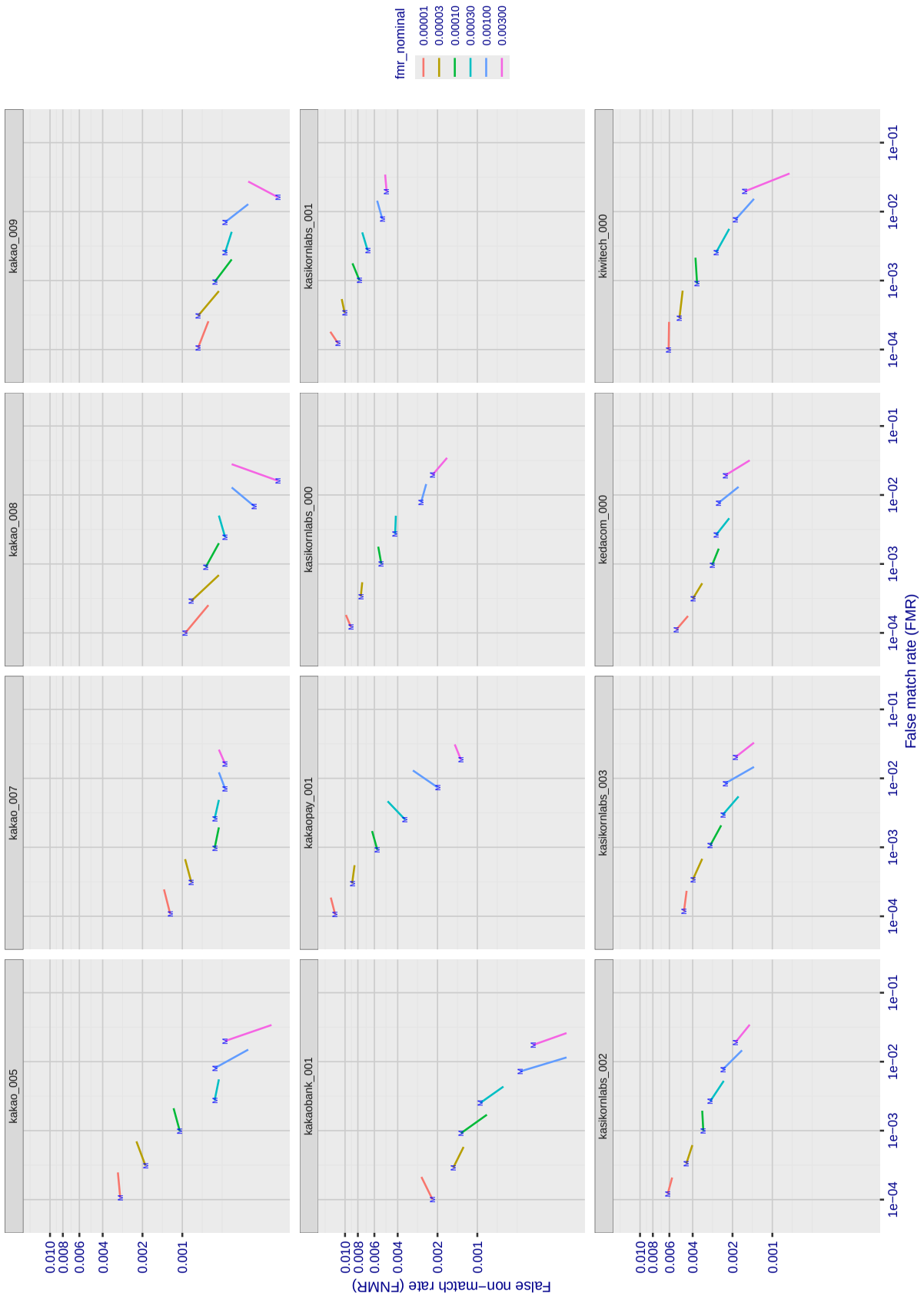

Figure 484: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

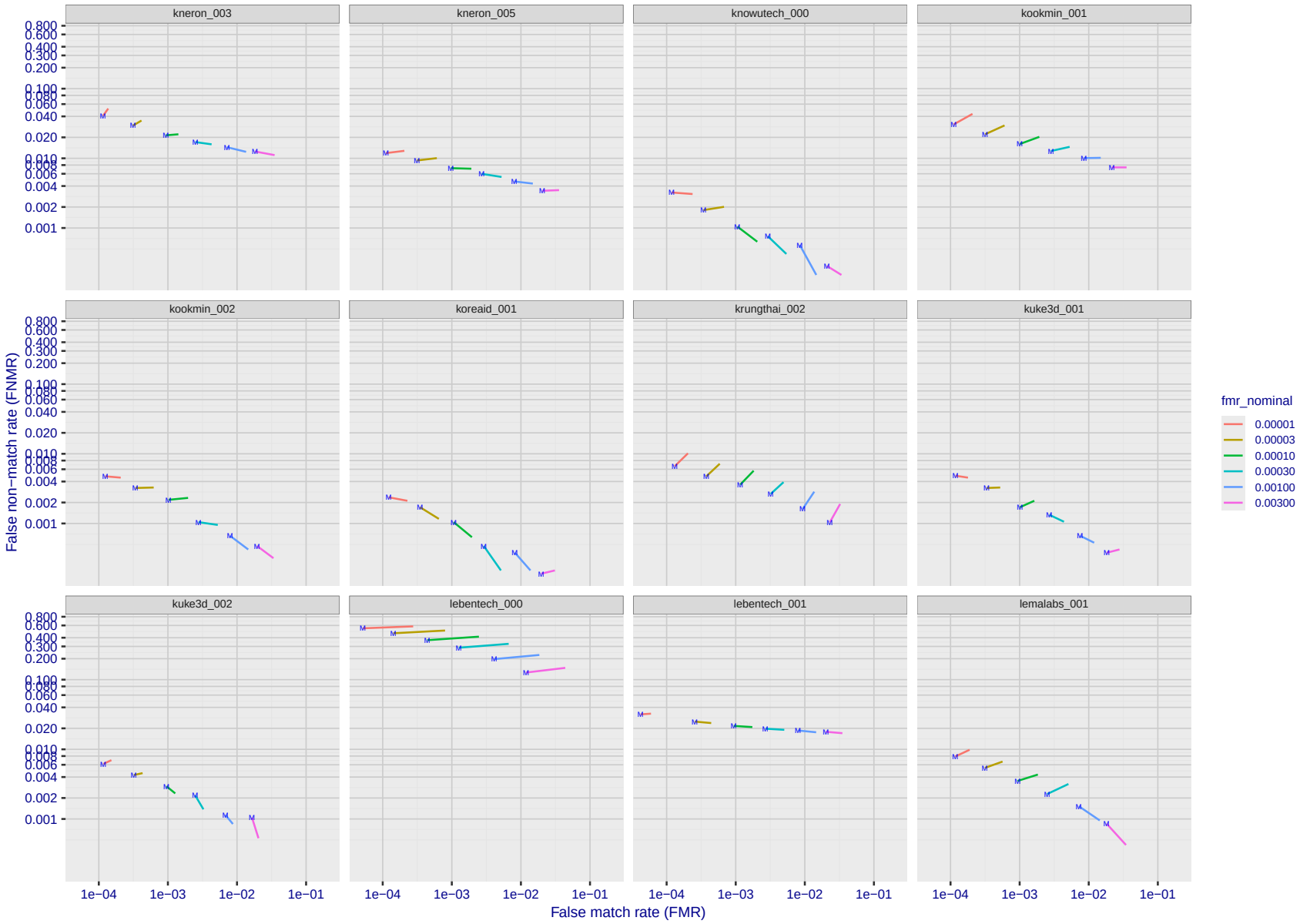

Figure 485: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

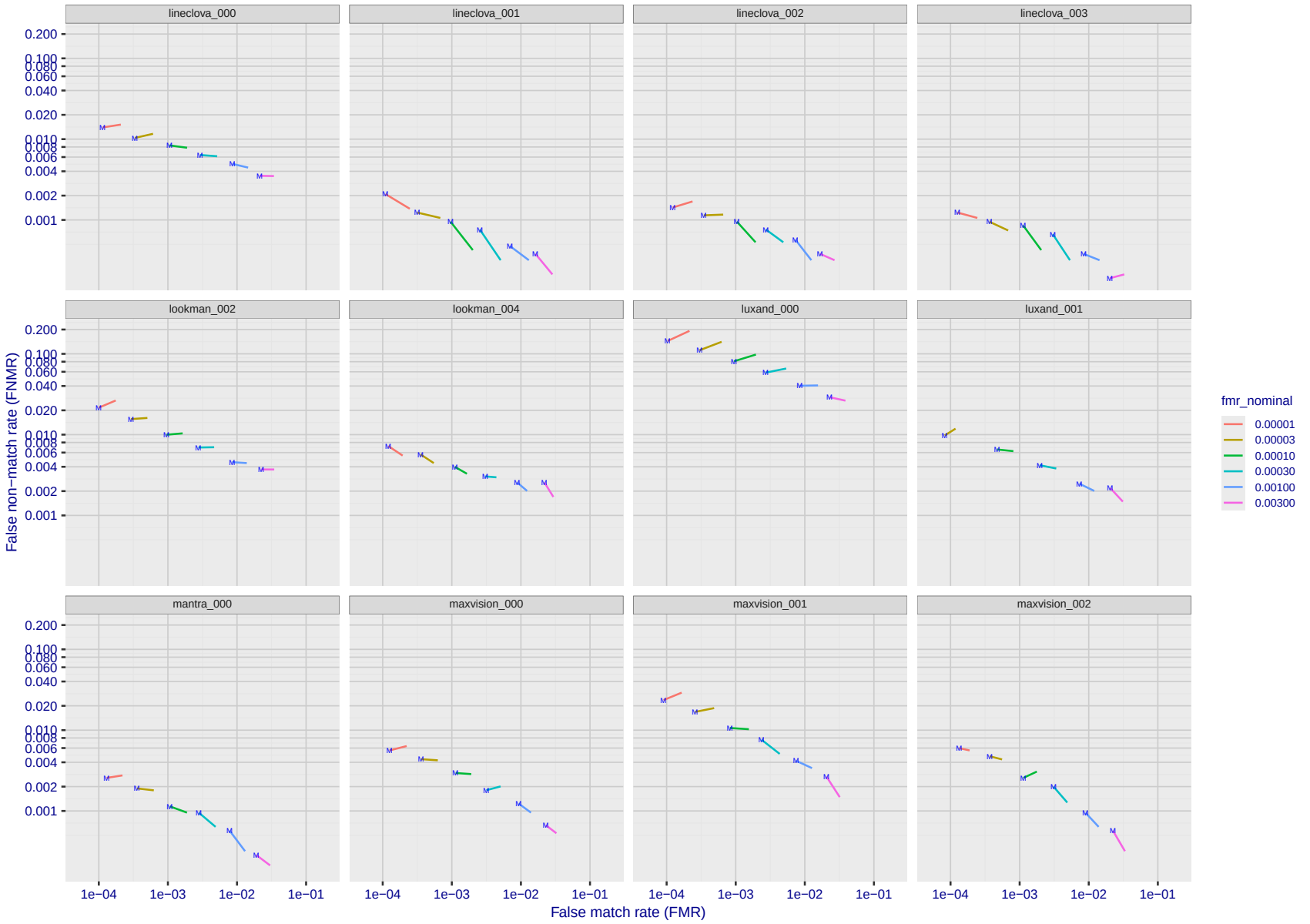

Figure 486: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

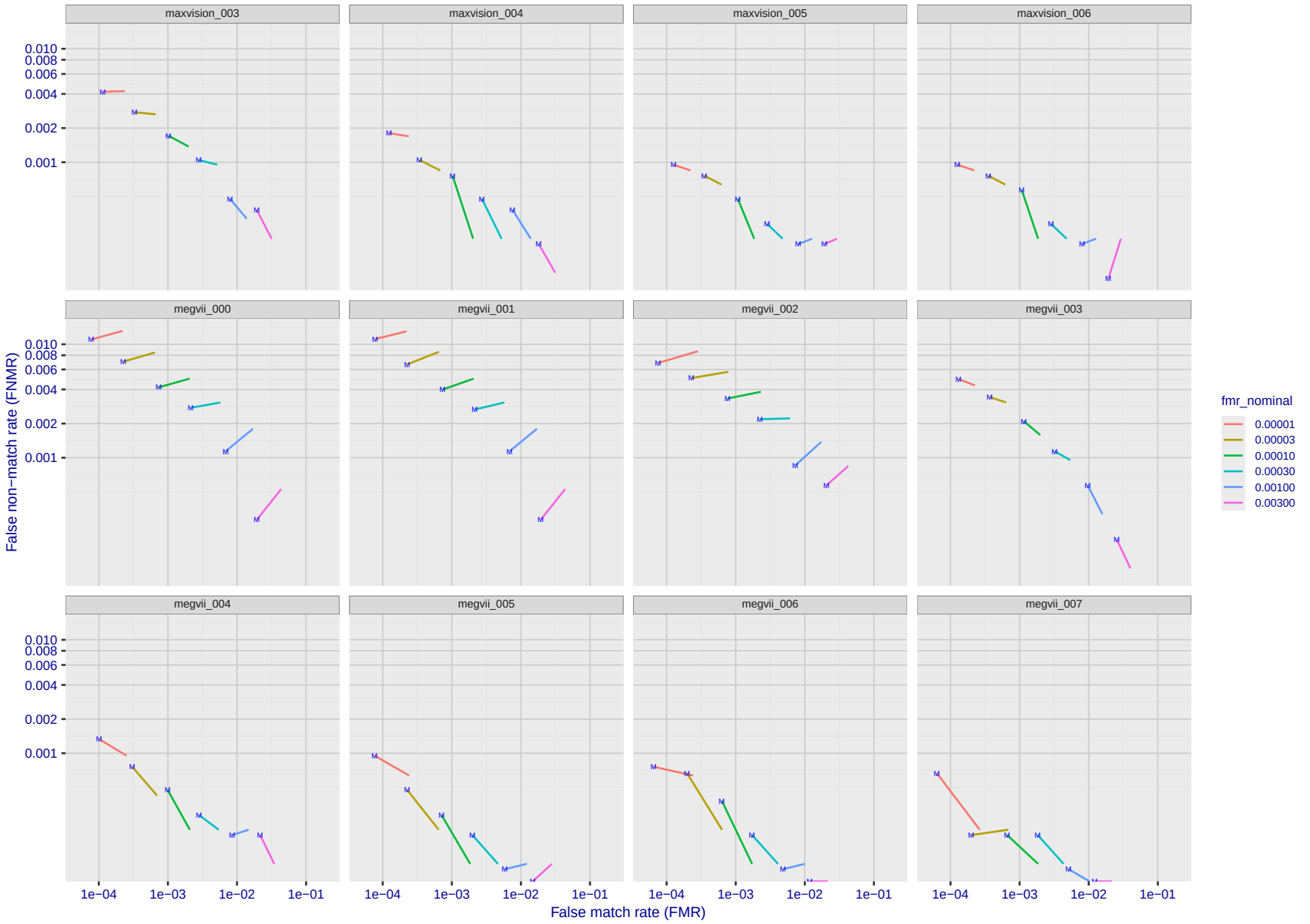

Figure 487: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

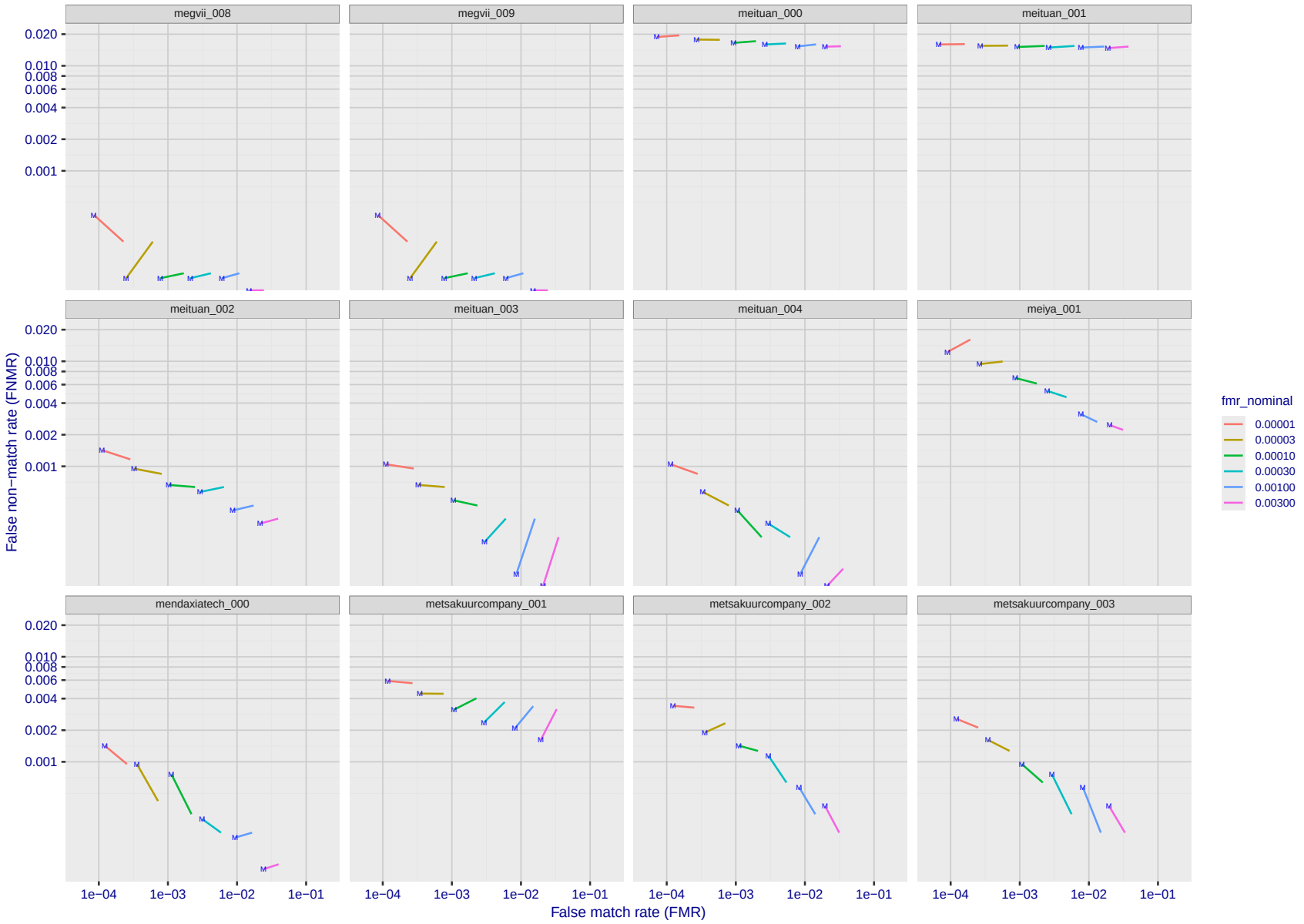

Figure 488: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

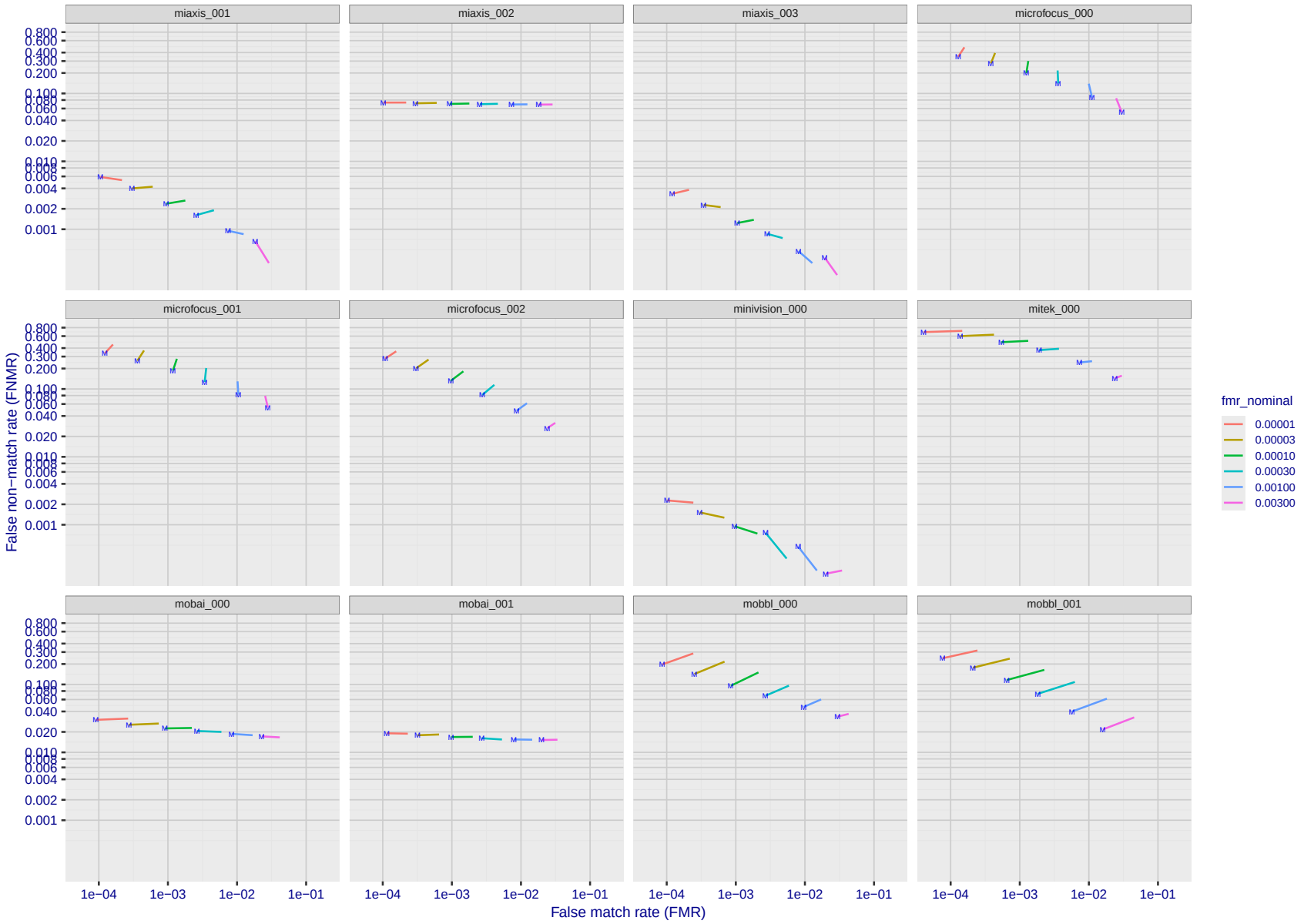

Figure 489: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

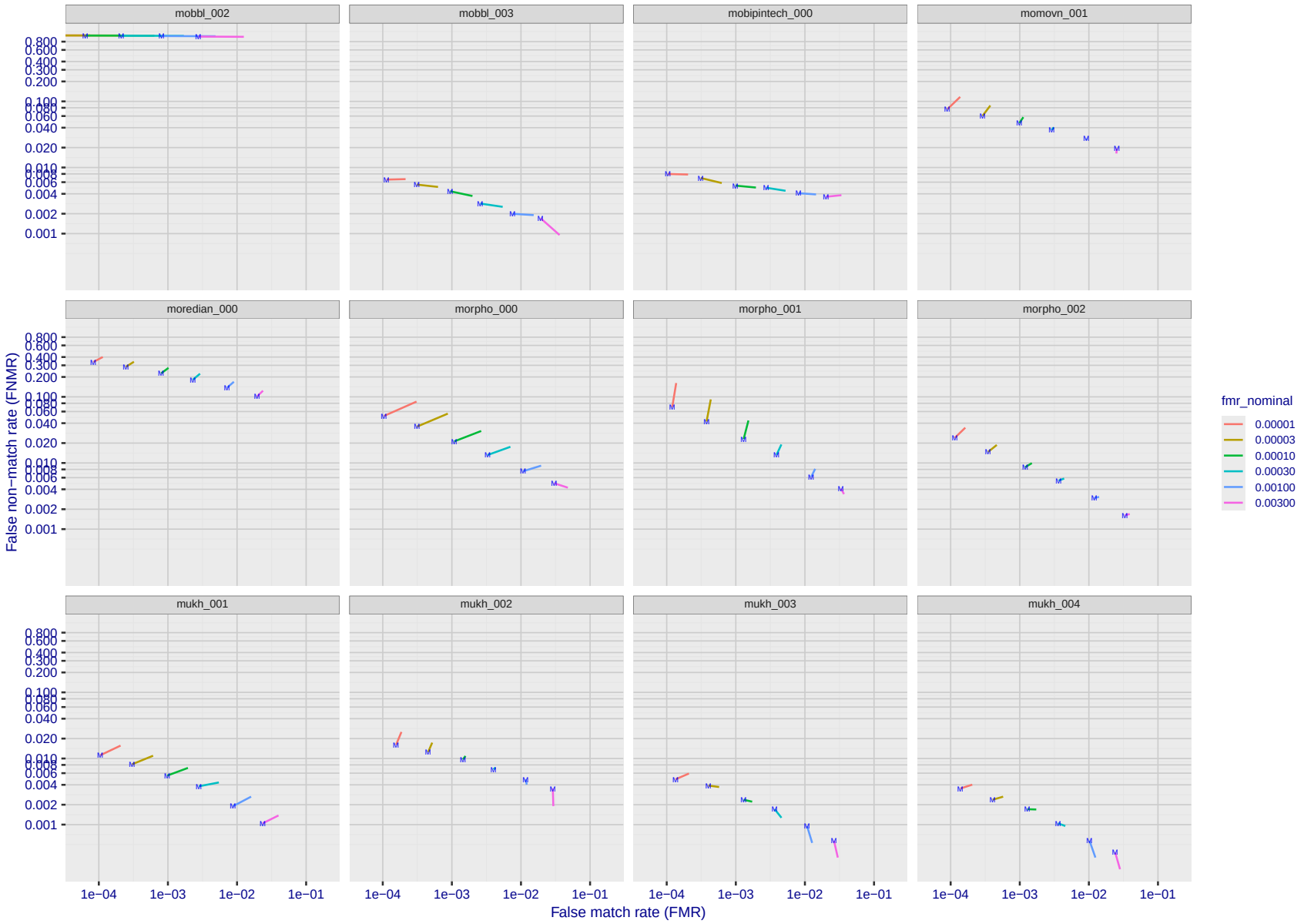

Figure 490: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

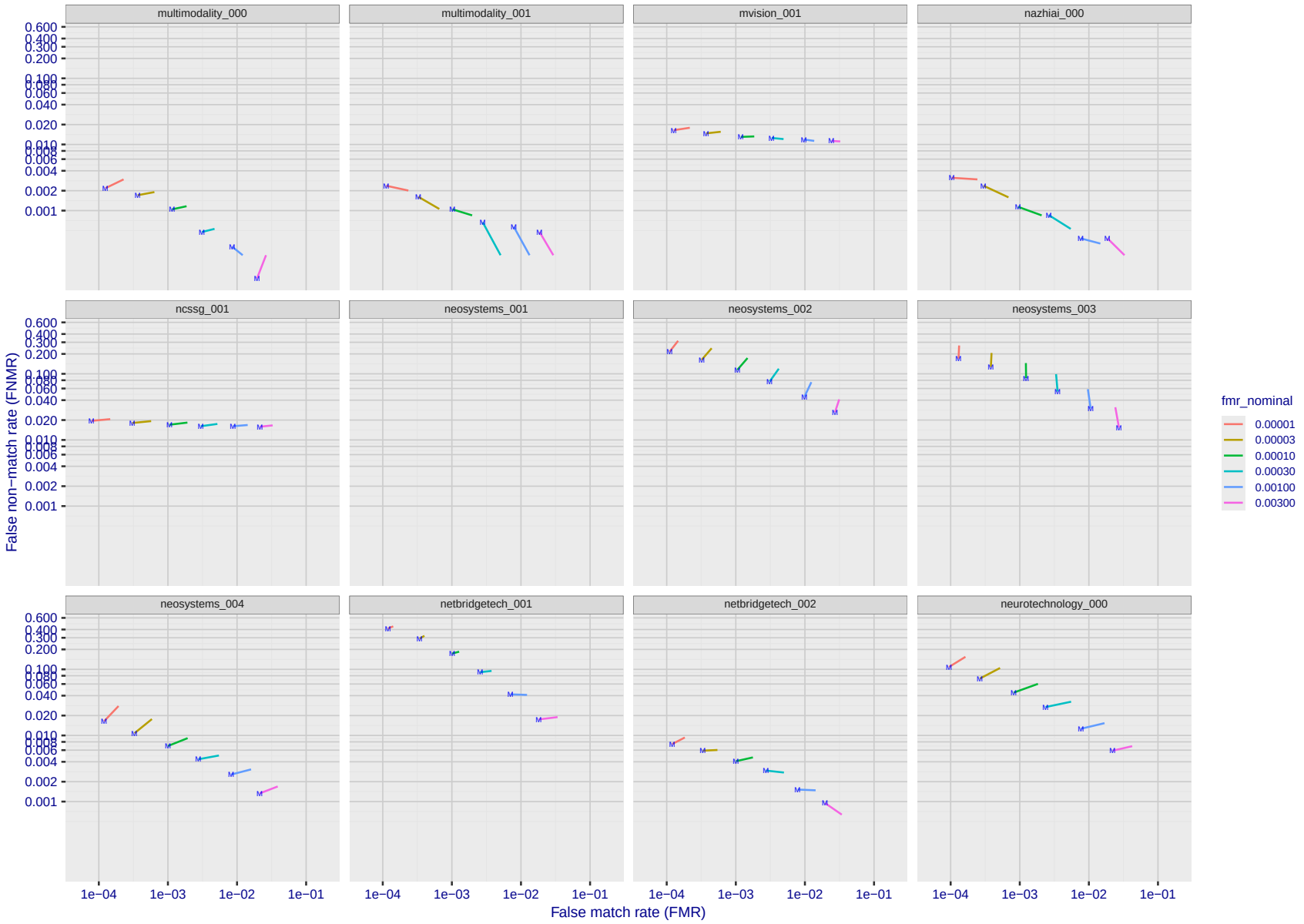

Figure 491: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

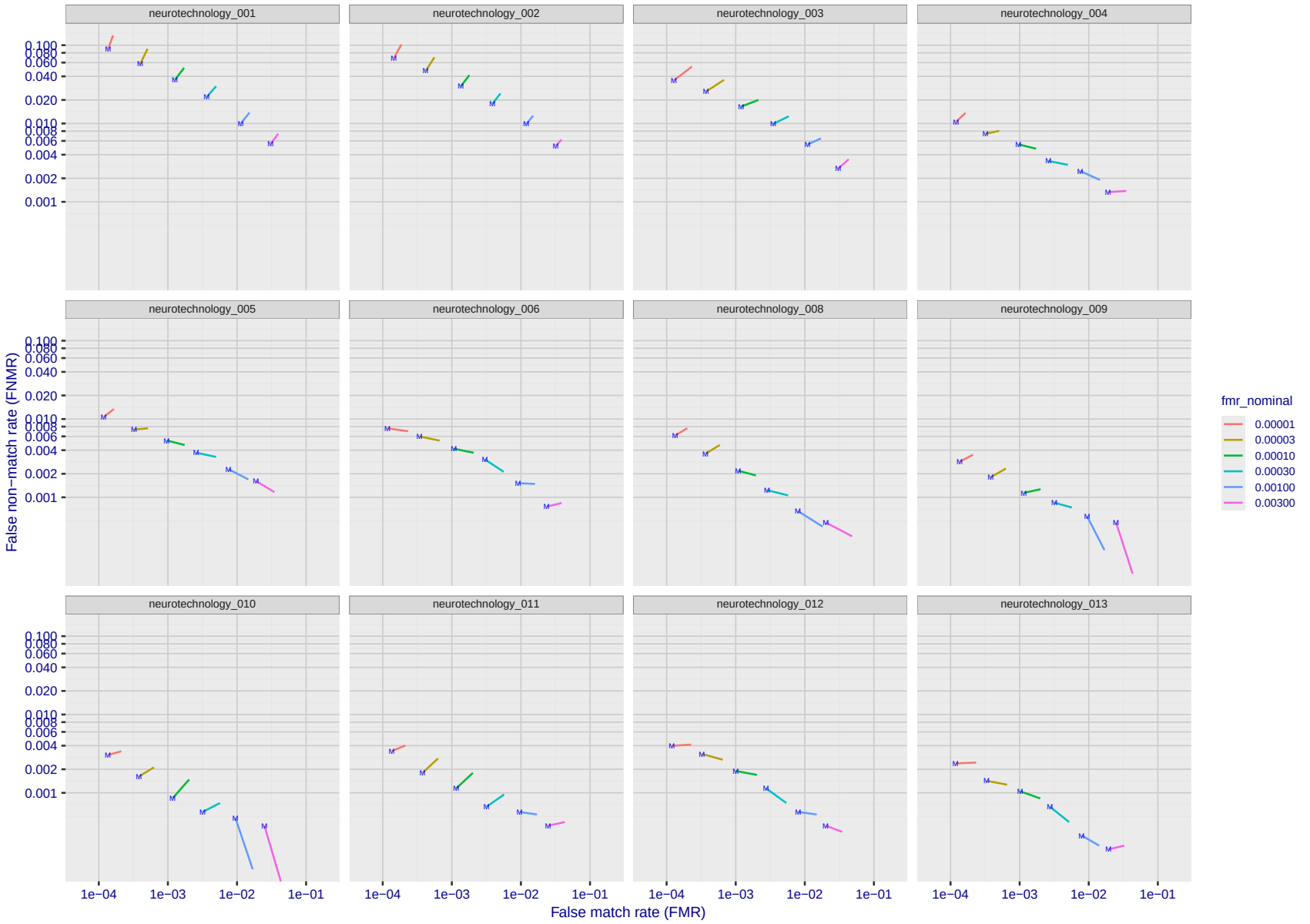

Figure 492: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

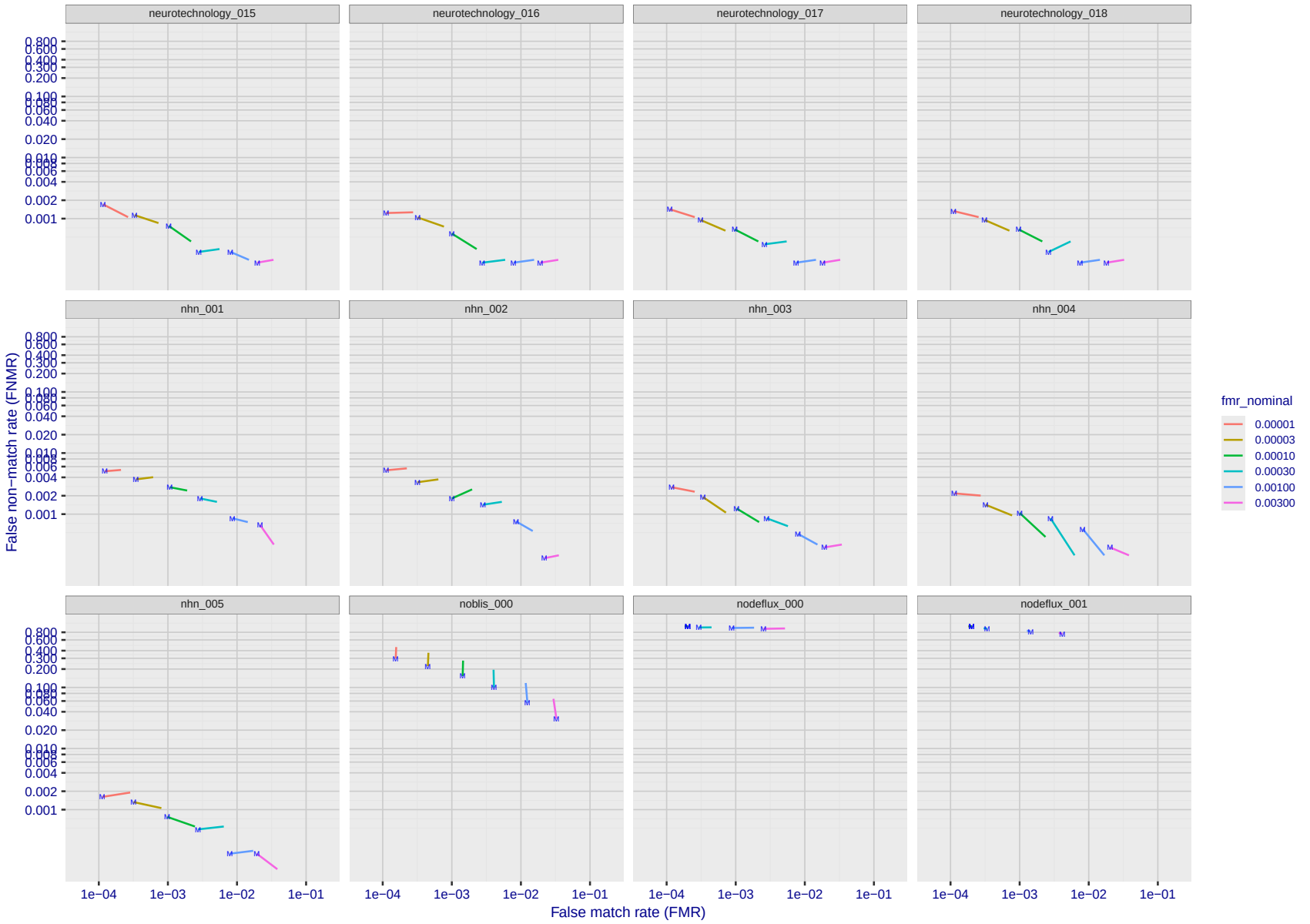

Figure 493: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

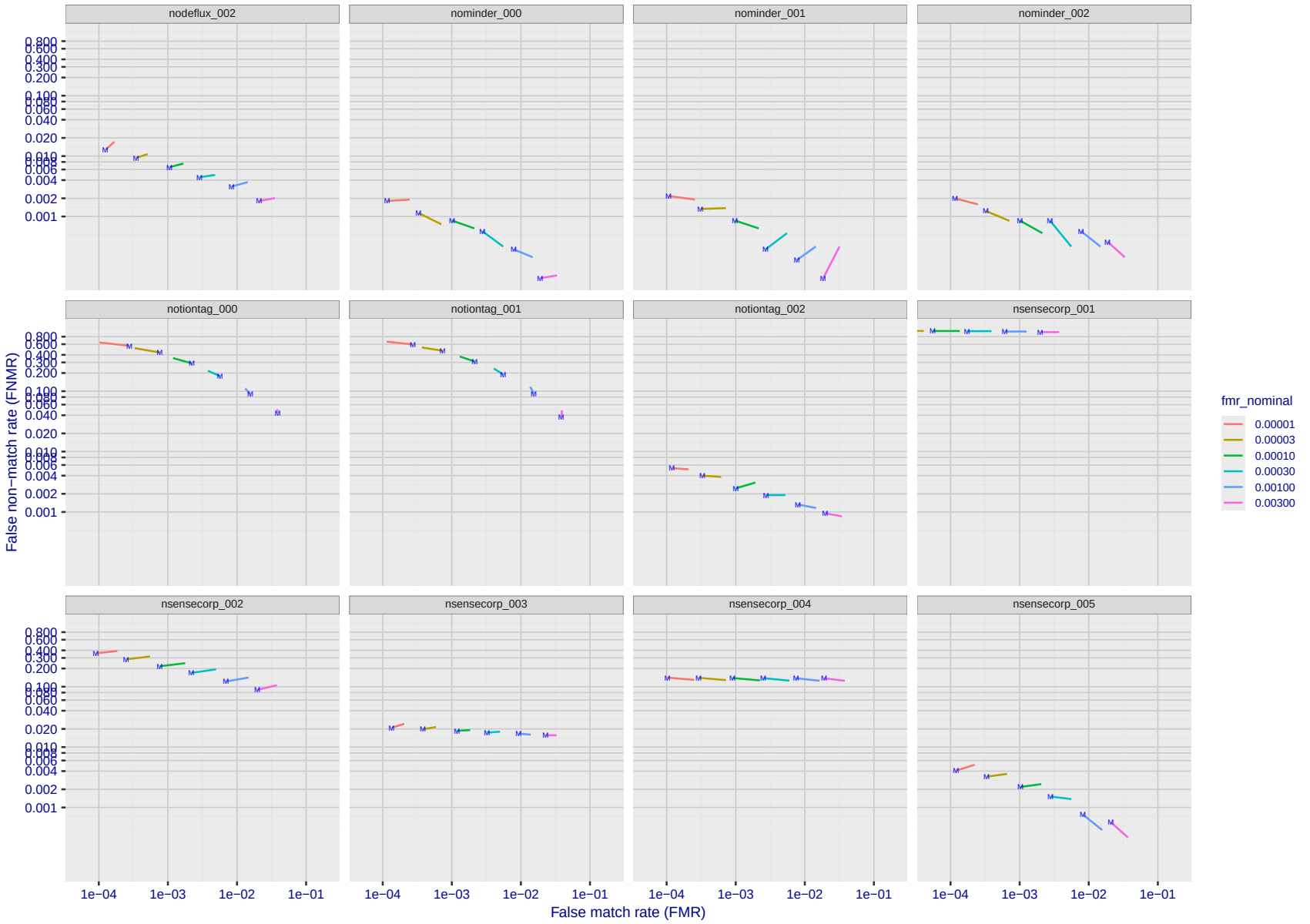

Figure 494: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

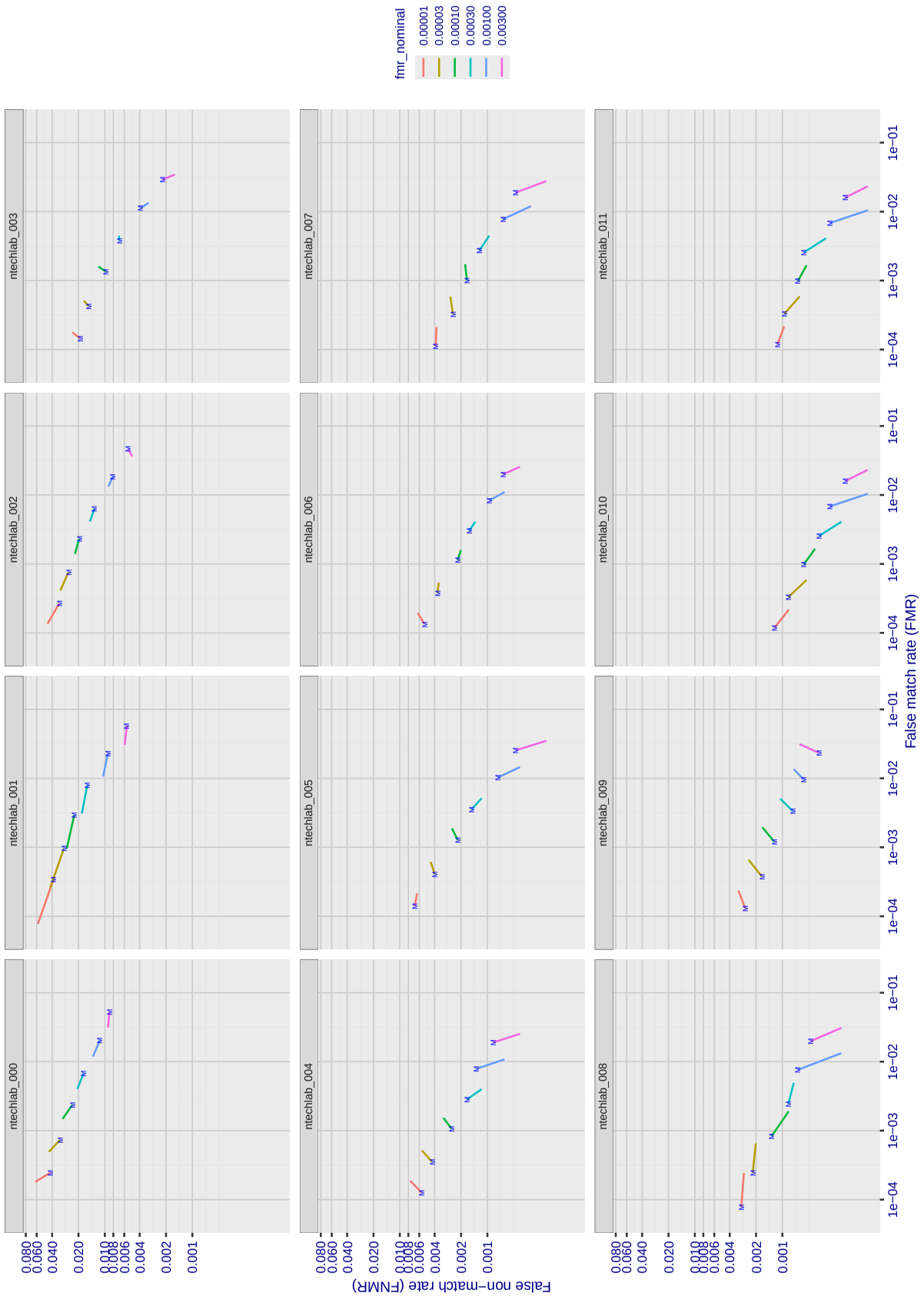

Figure 495: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between $(FMR,FNMR)_{\text{MALE}}$ and $(FMR,FNMR)_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

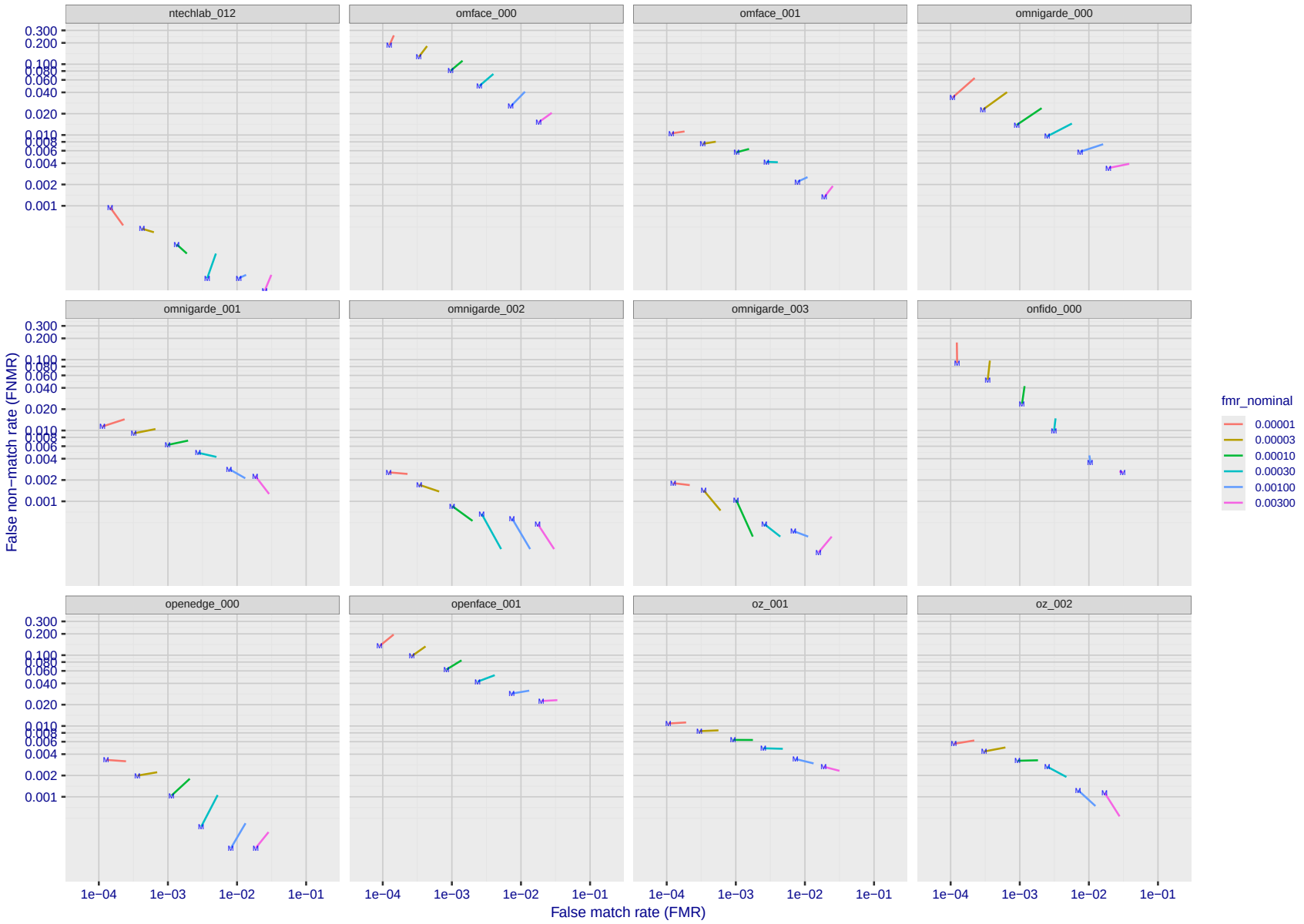

Figure 496: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

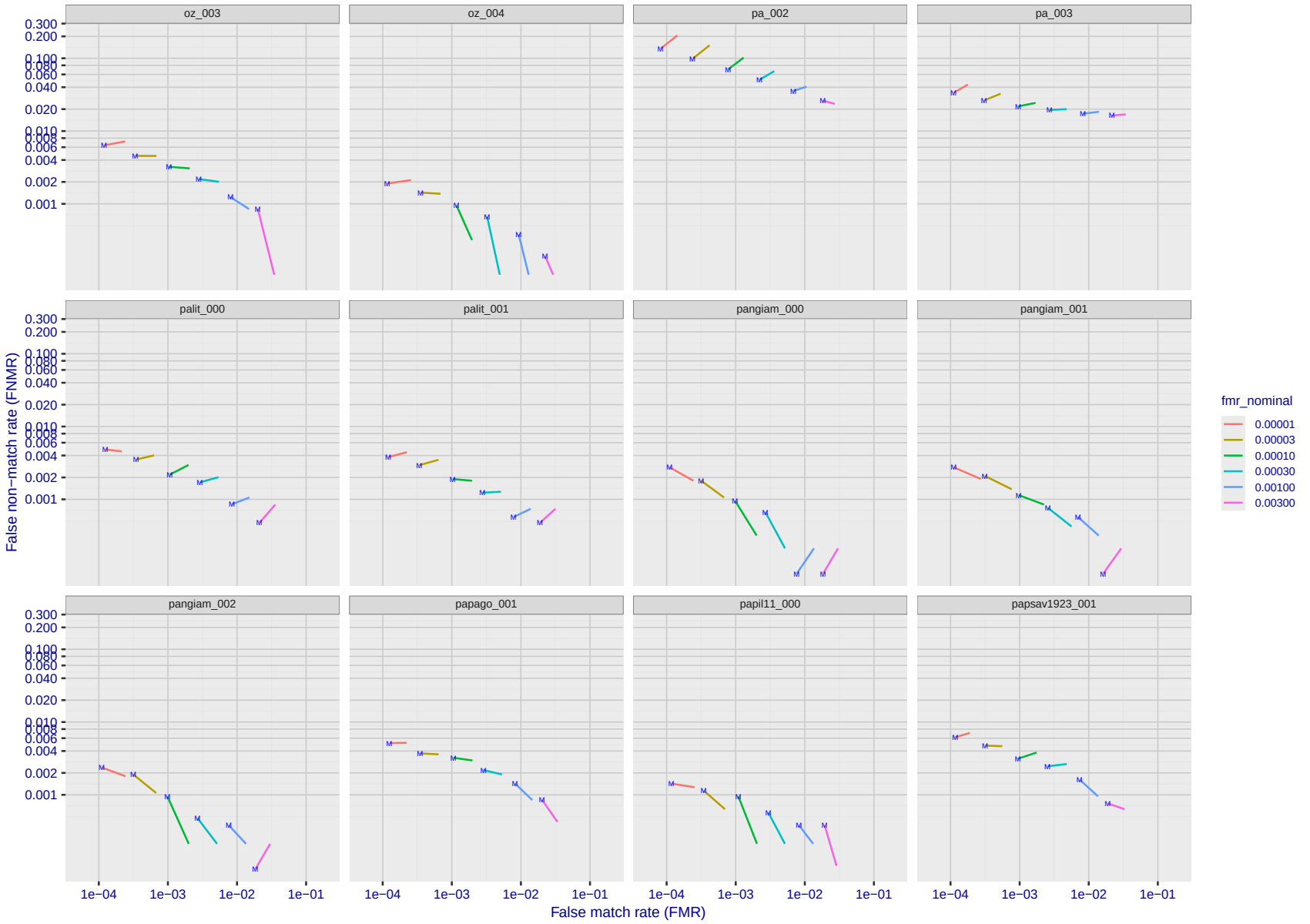

Figure 497: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

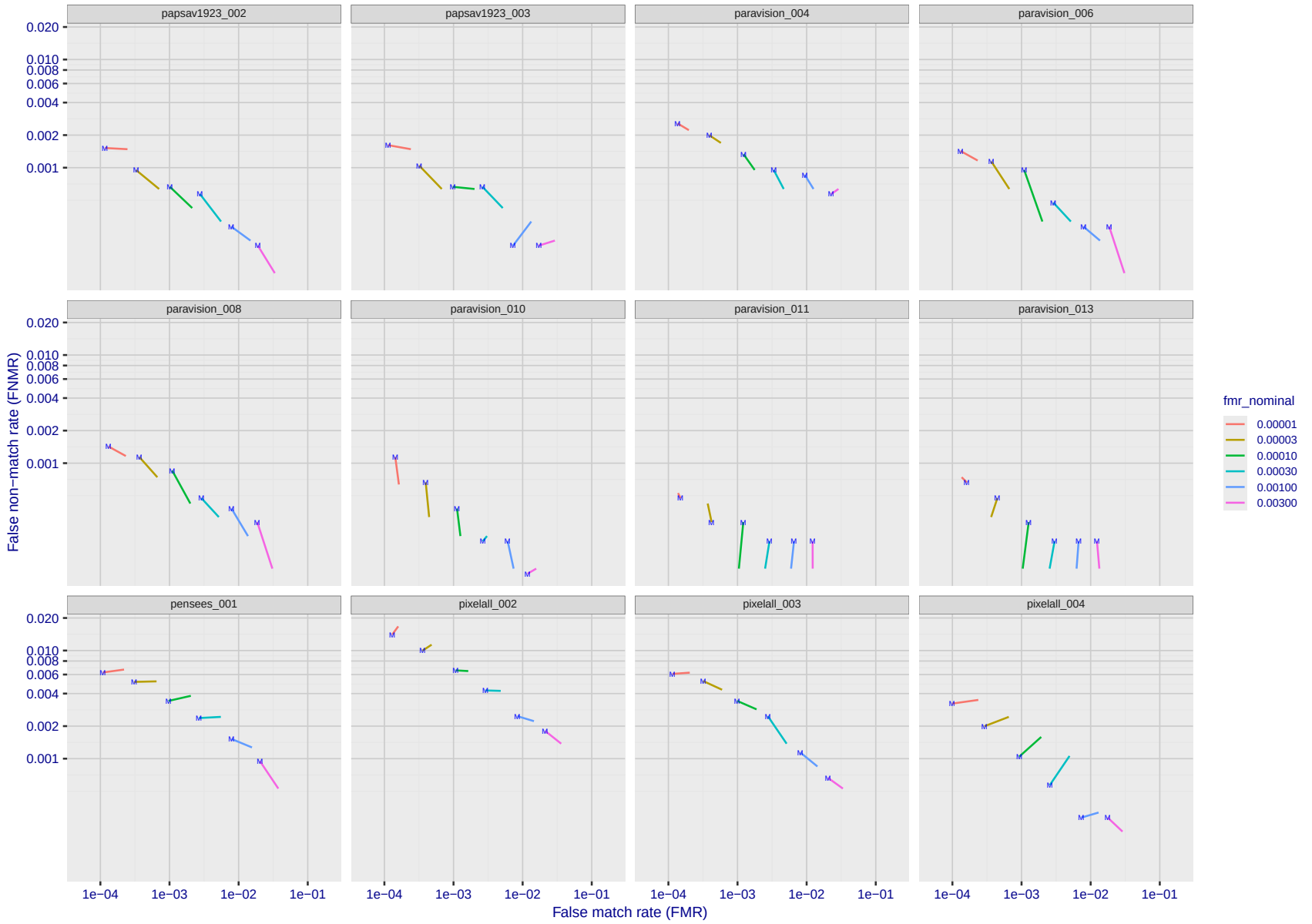

Figure 498: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

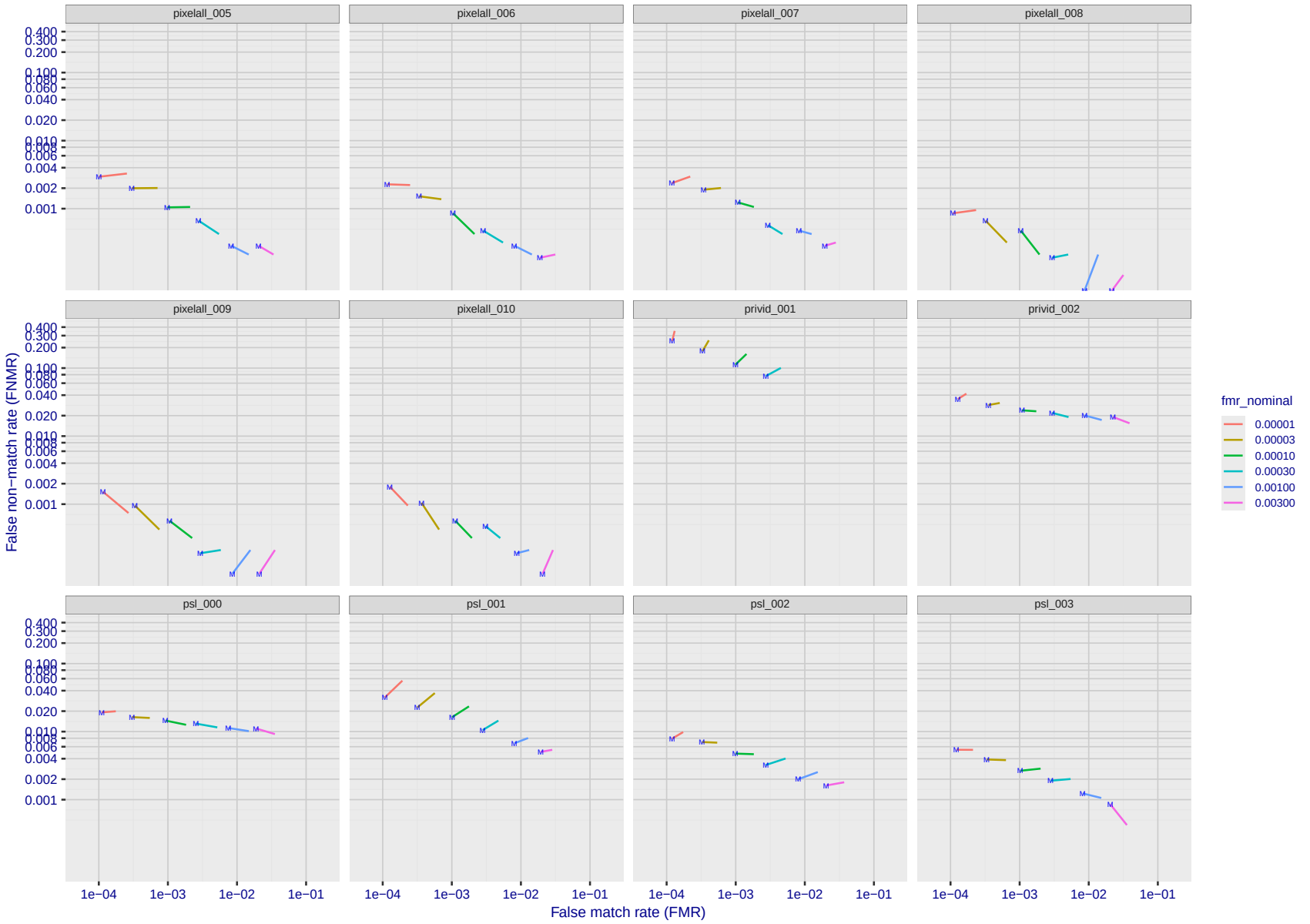

Figure 499: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

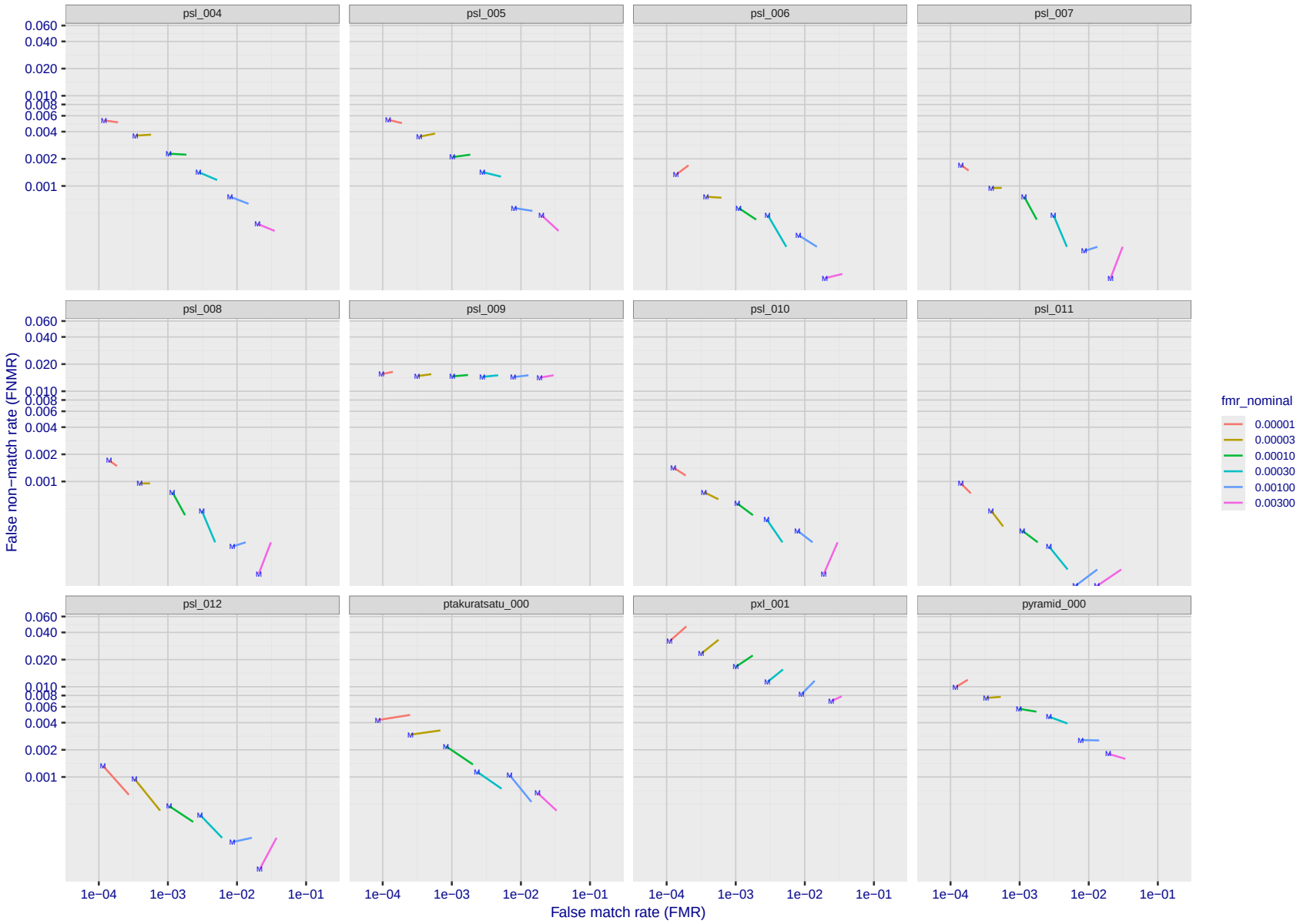

Figure 500: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

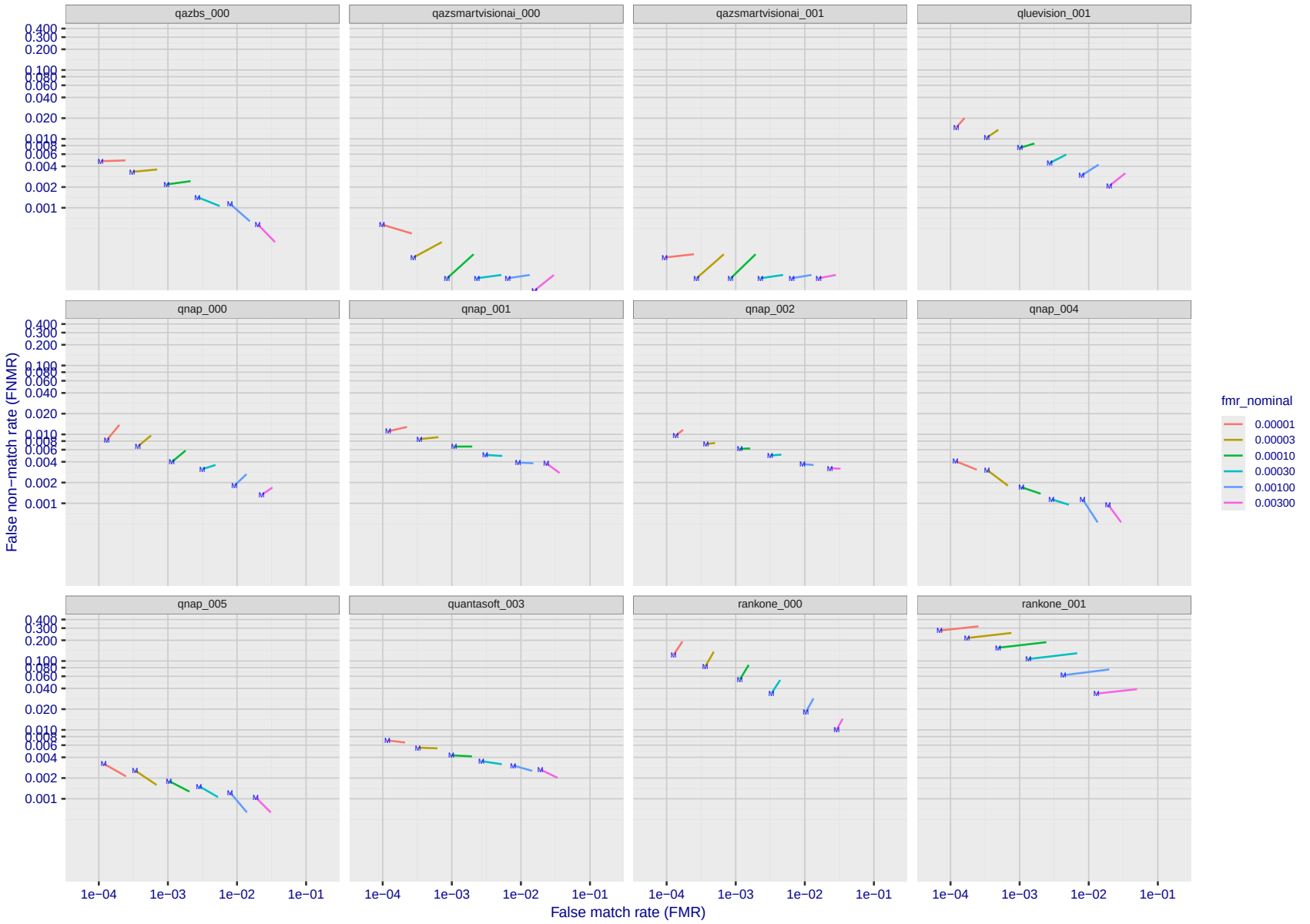

Figure 501: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

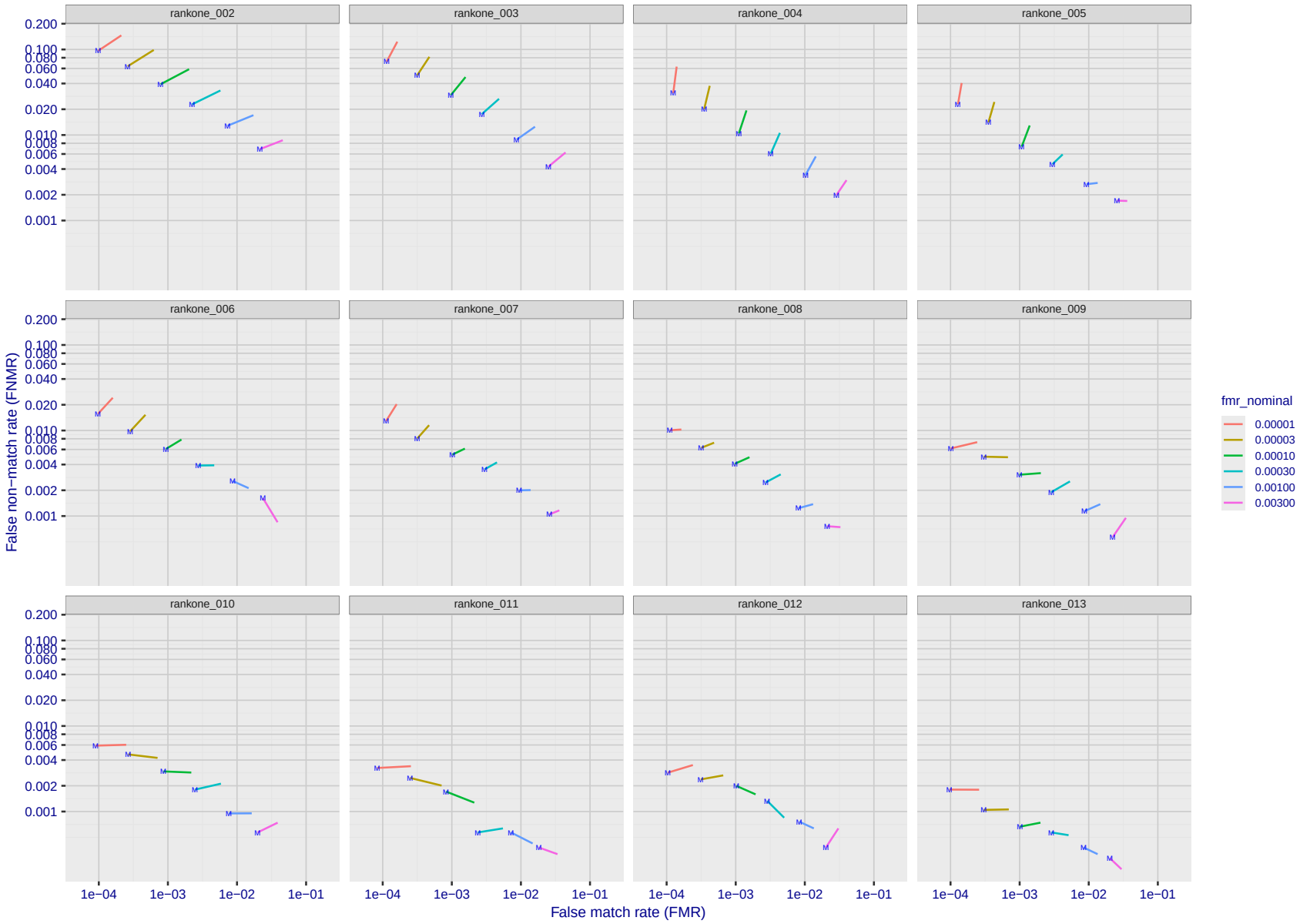

Figure 502: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

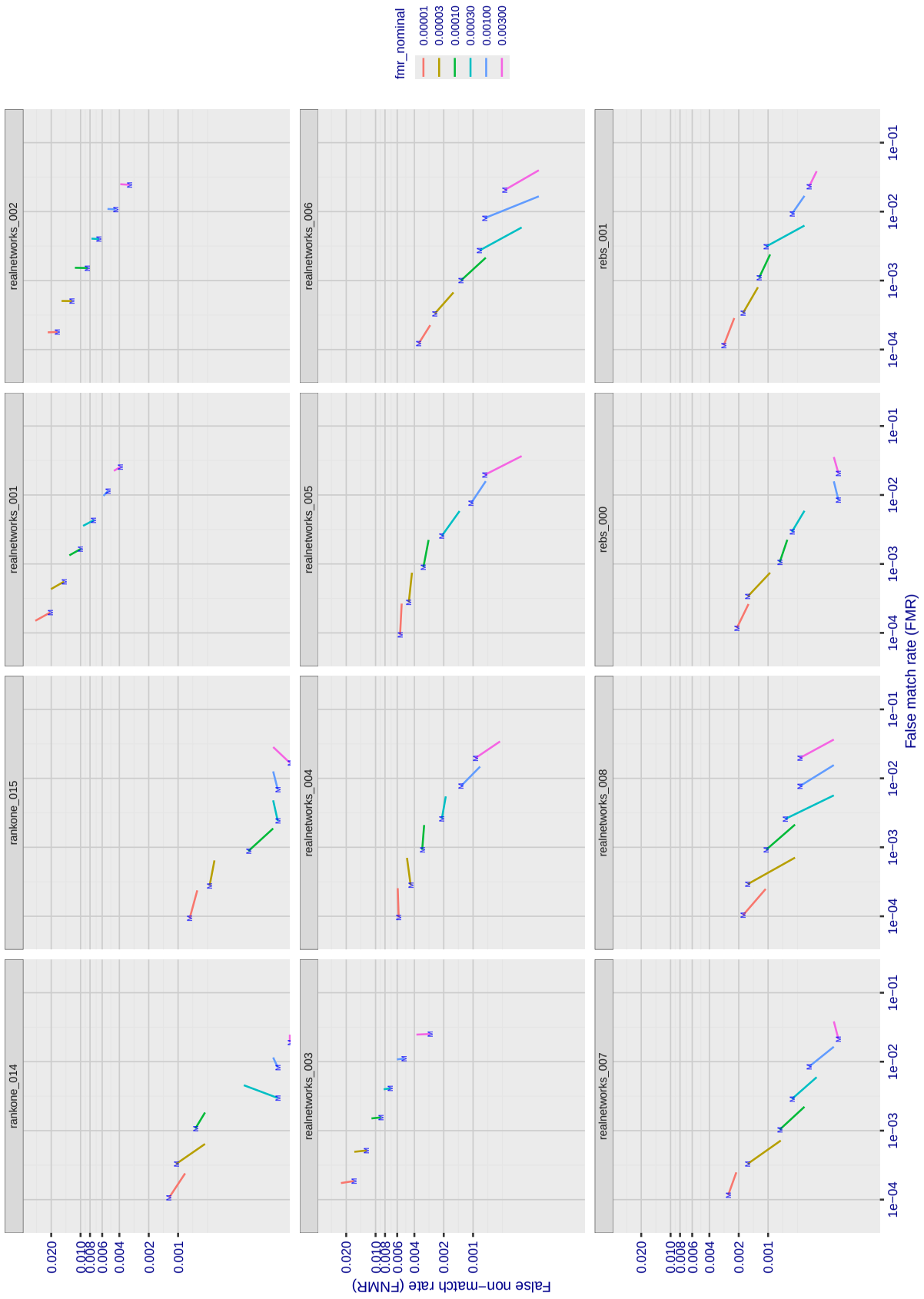

Figure 503: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

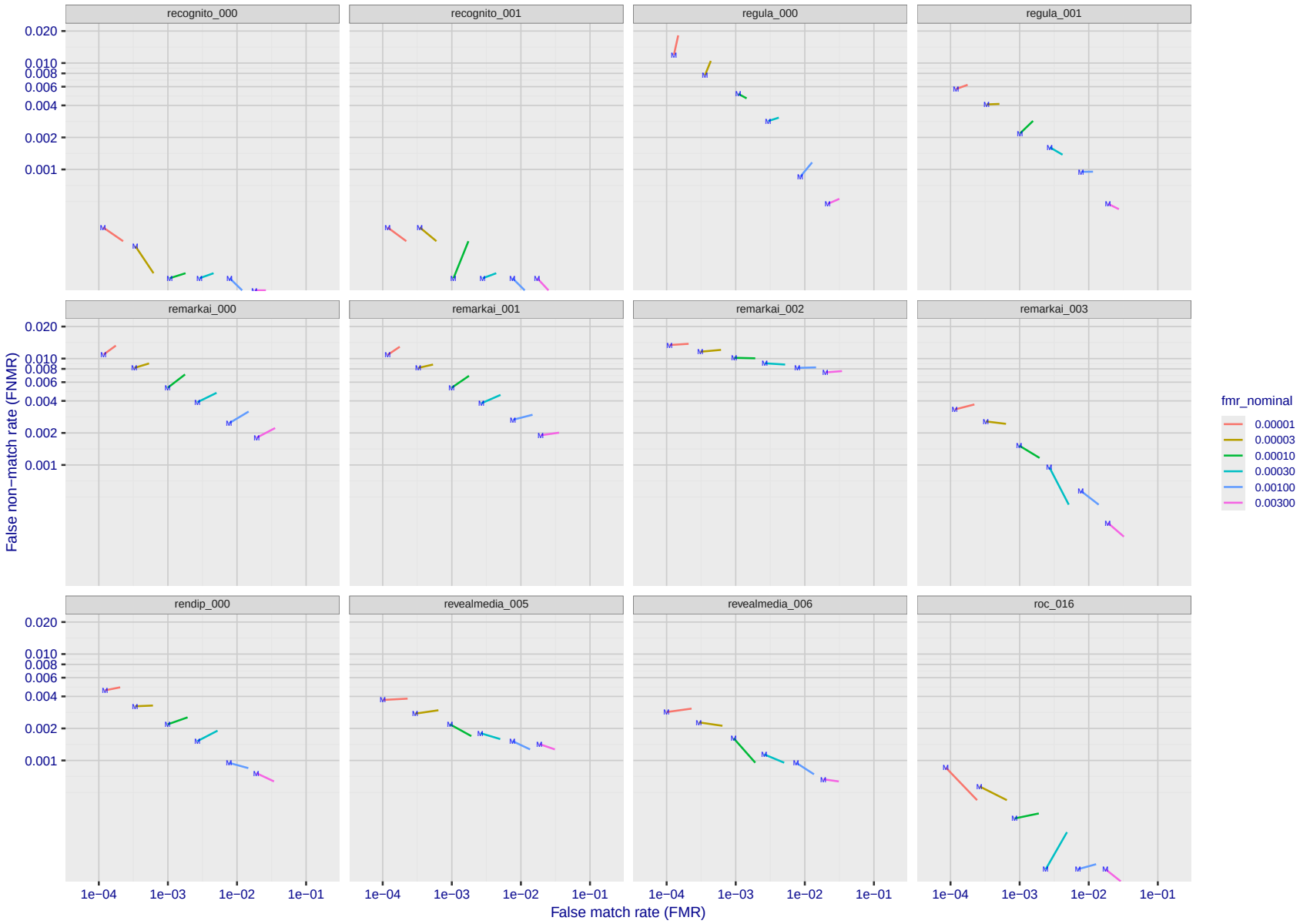

Figure 504: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

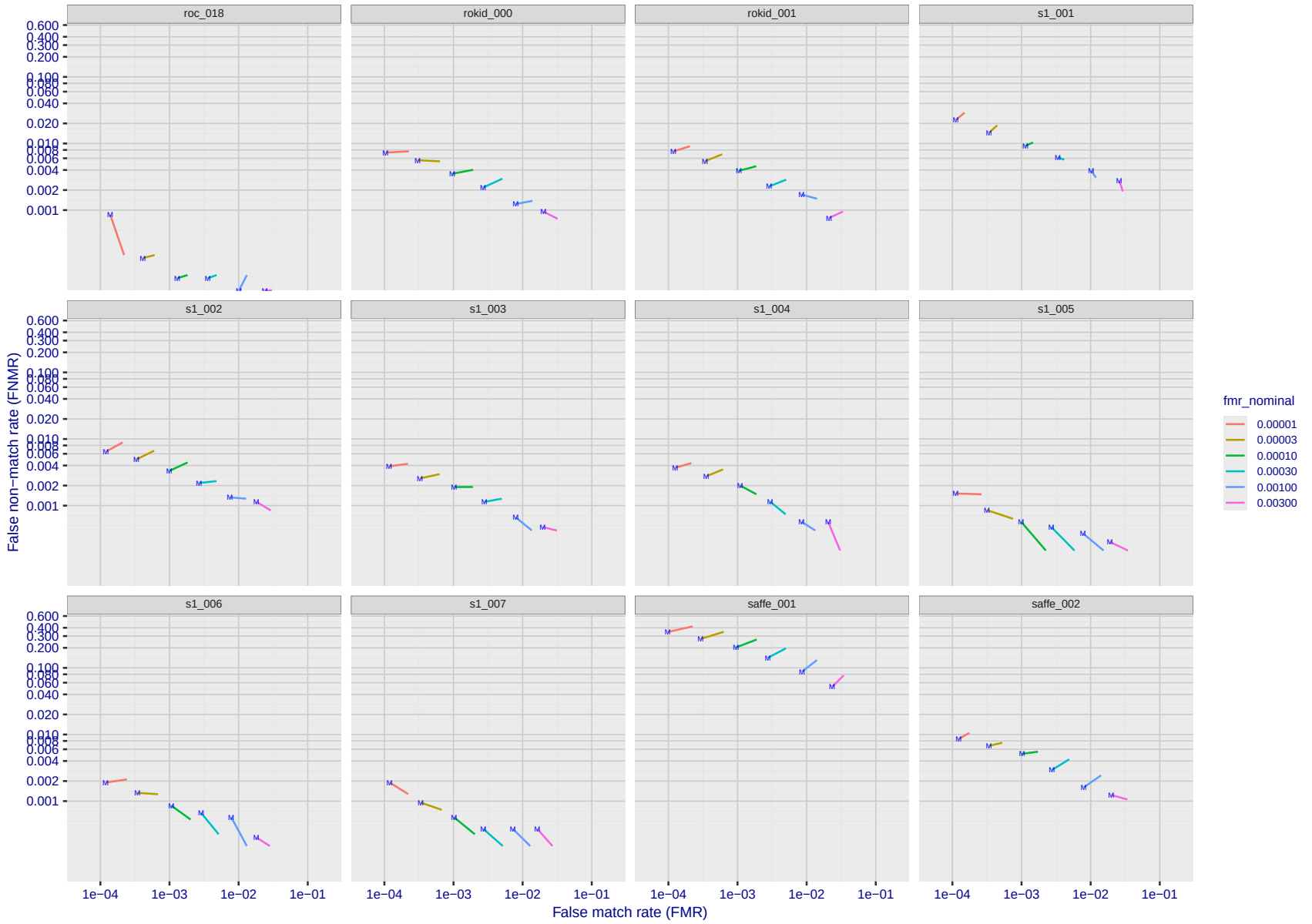

Figure 505: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

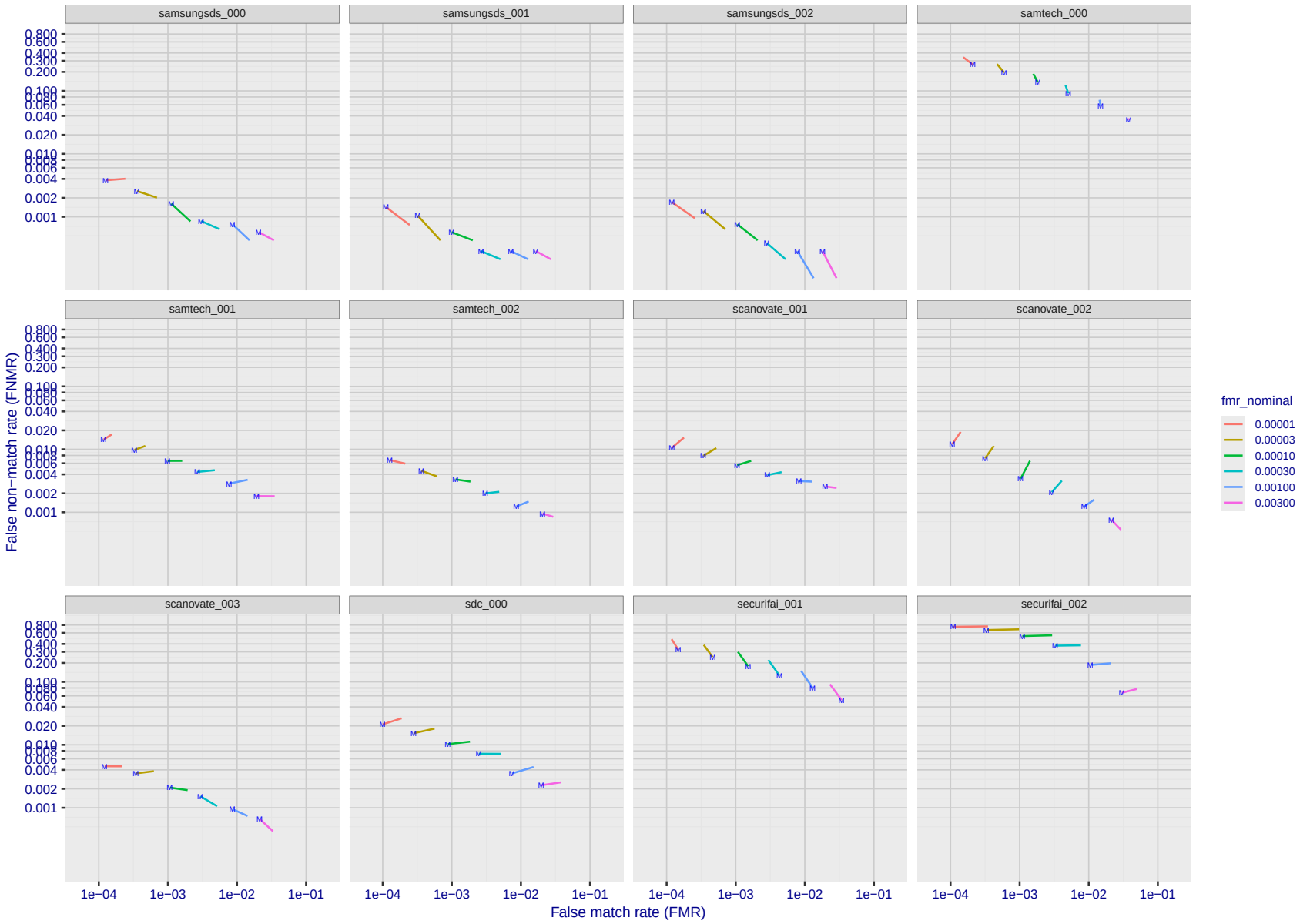

Figure 506: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

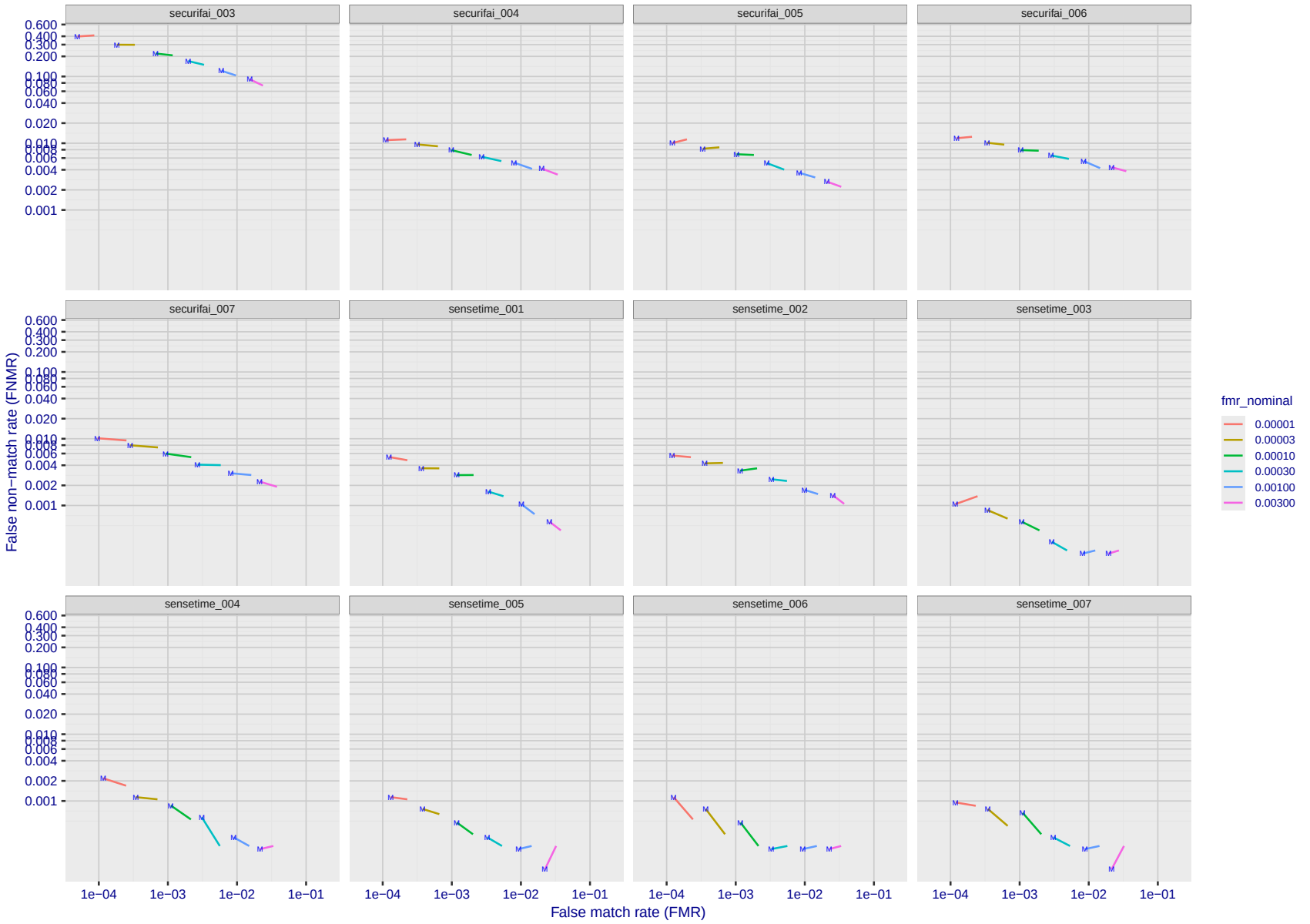

Figure 507: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

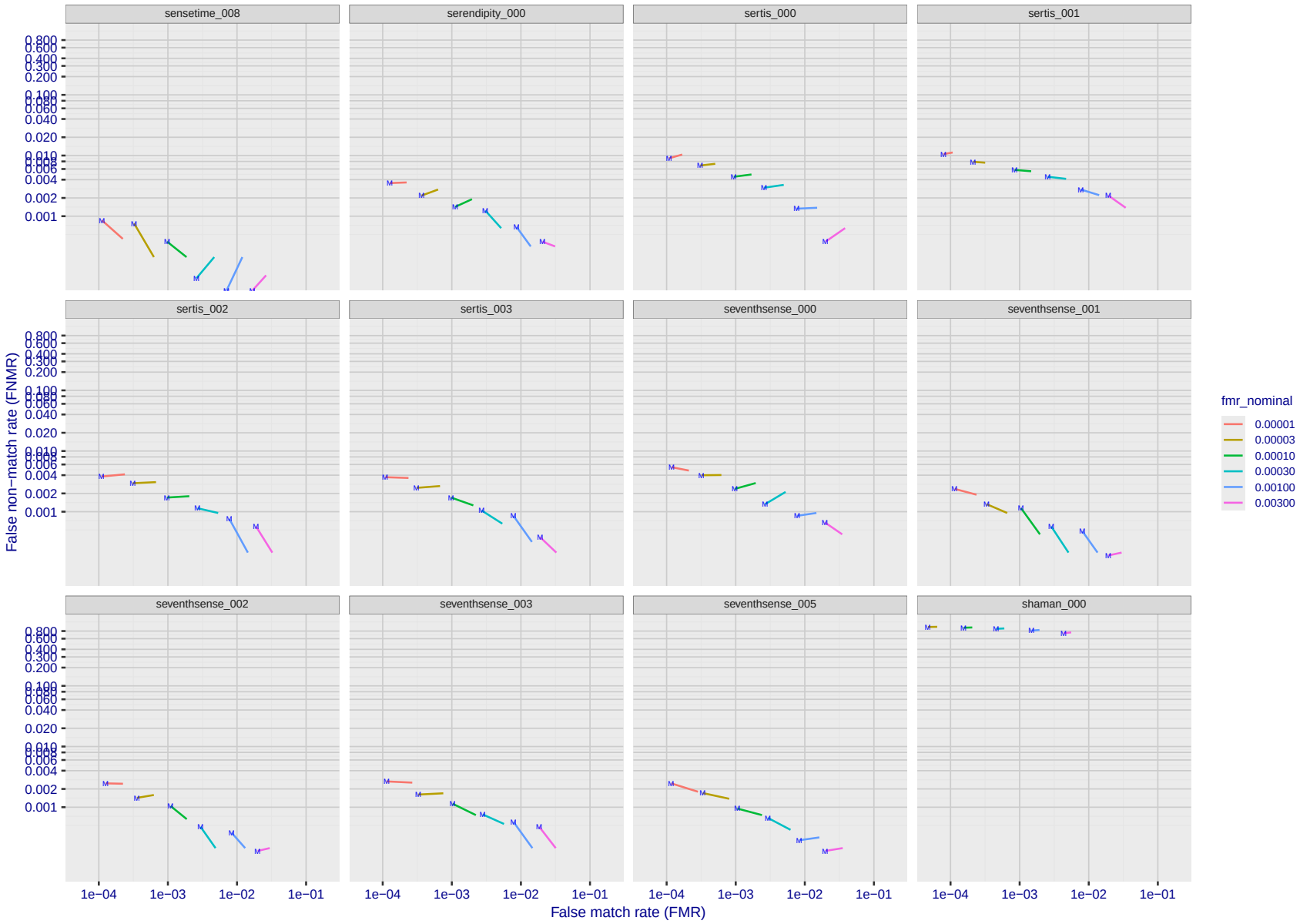

Figure 508: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

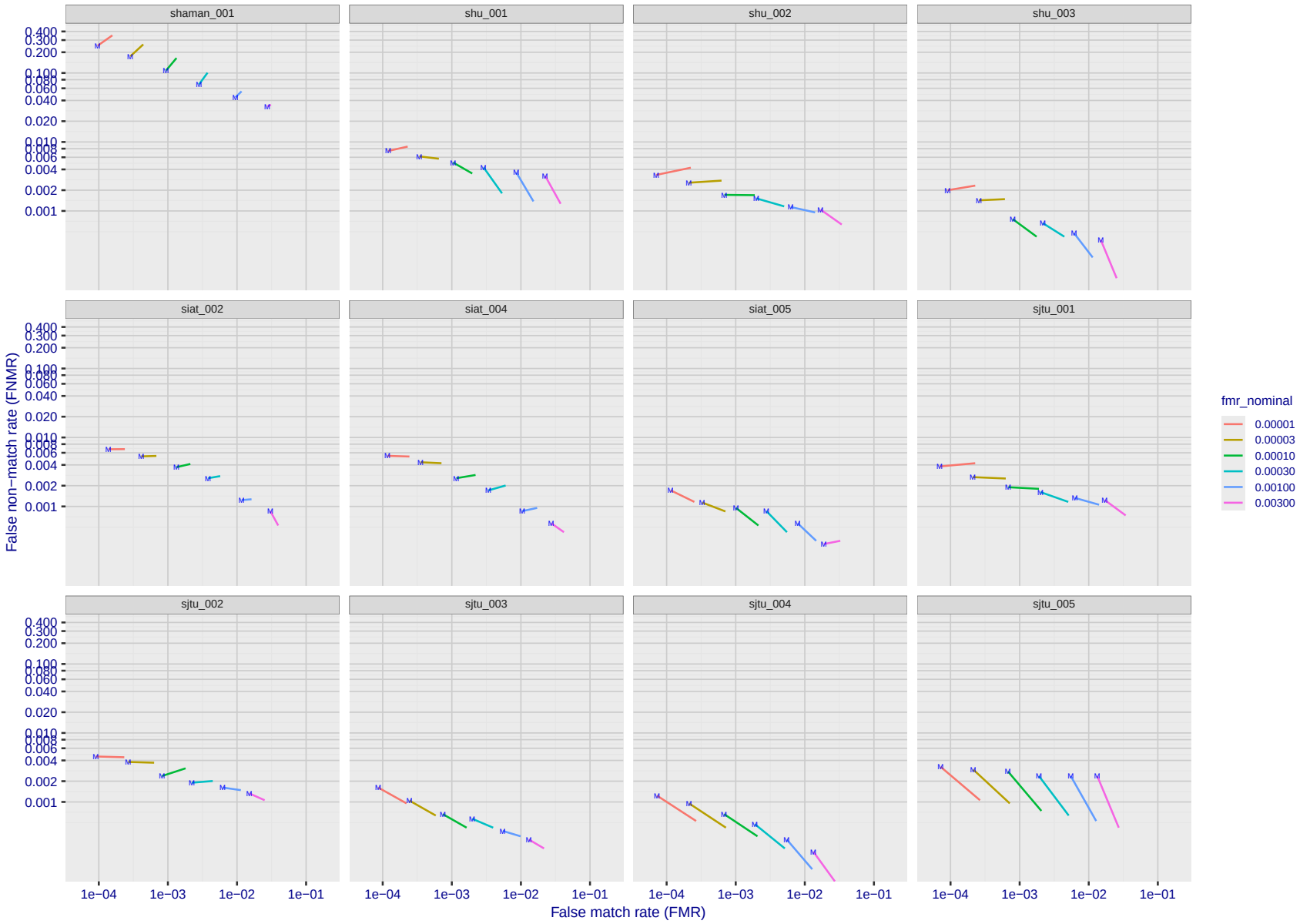

Figure 509: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

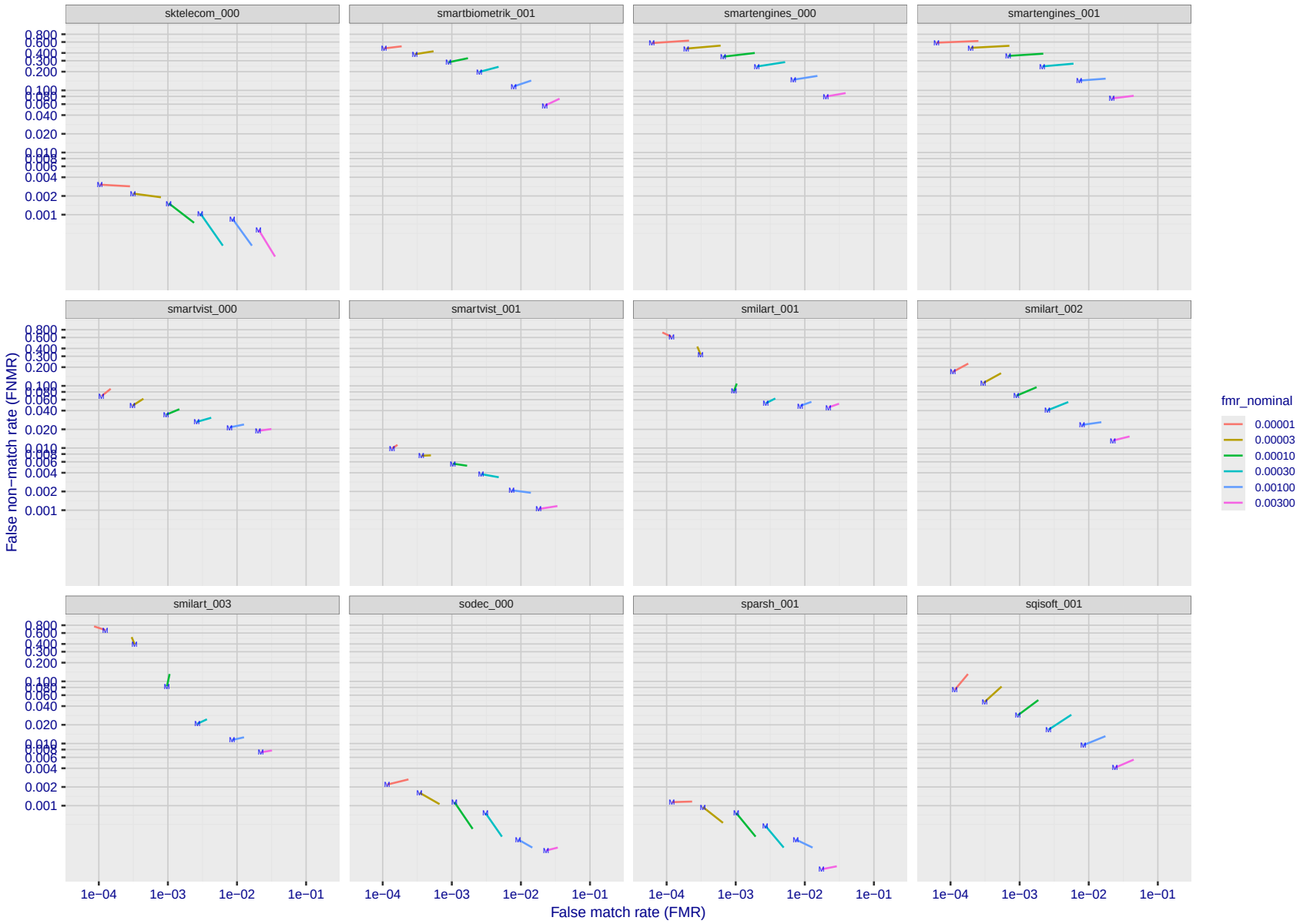

Figure 510: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

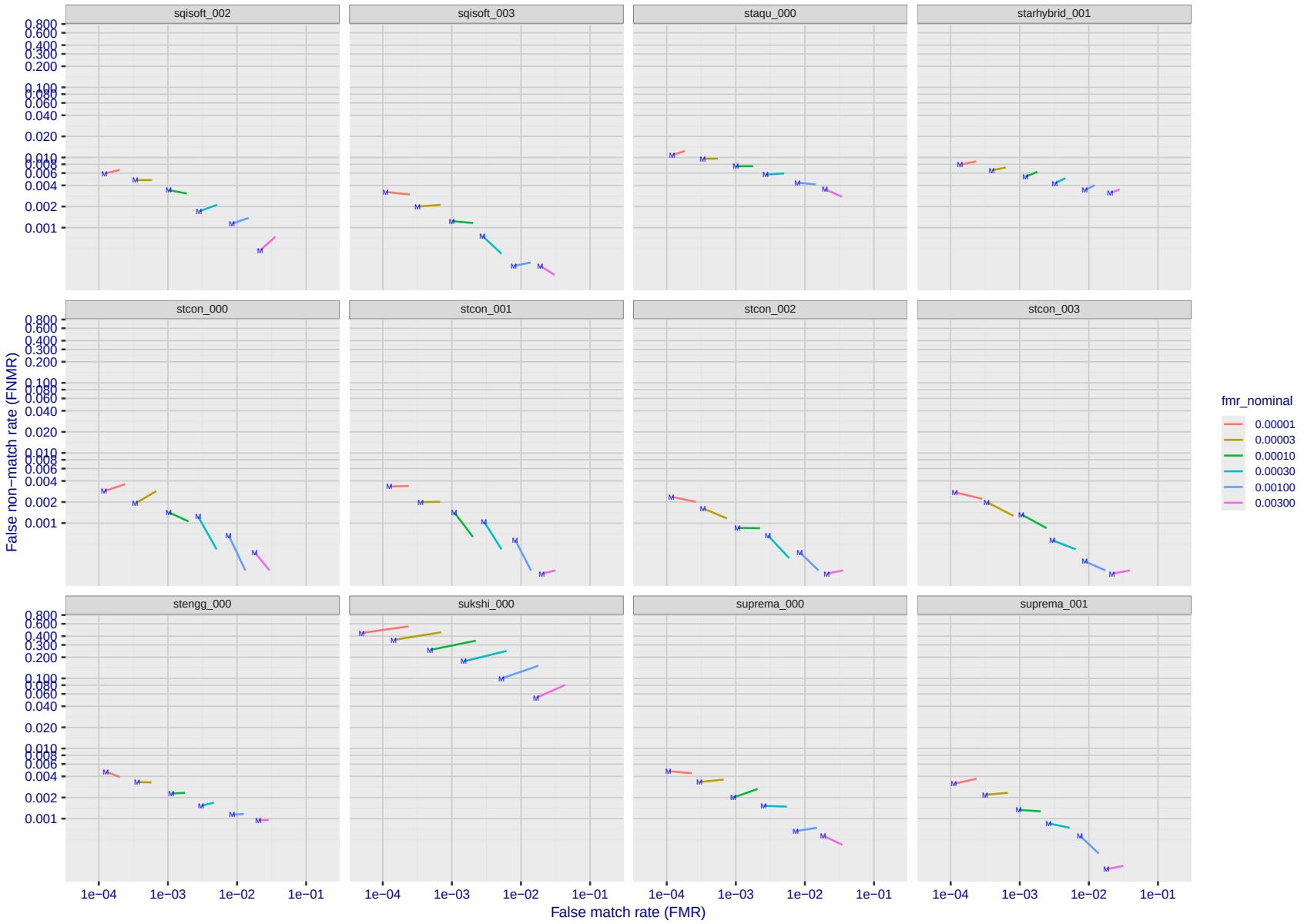

Figure 511: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

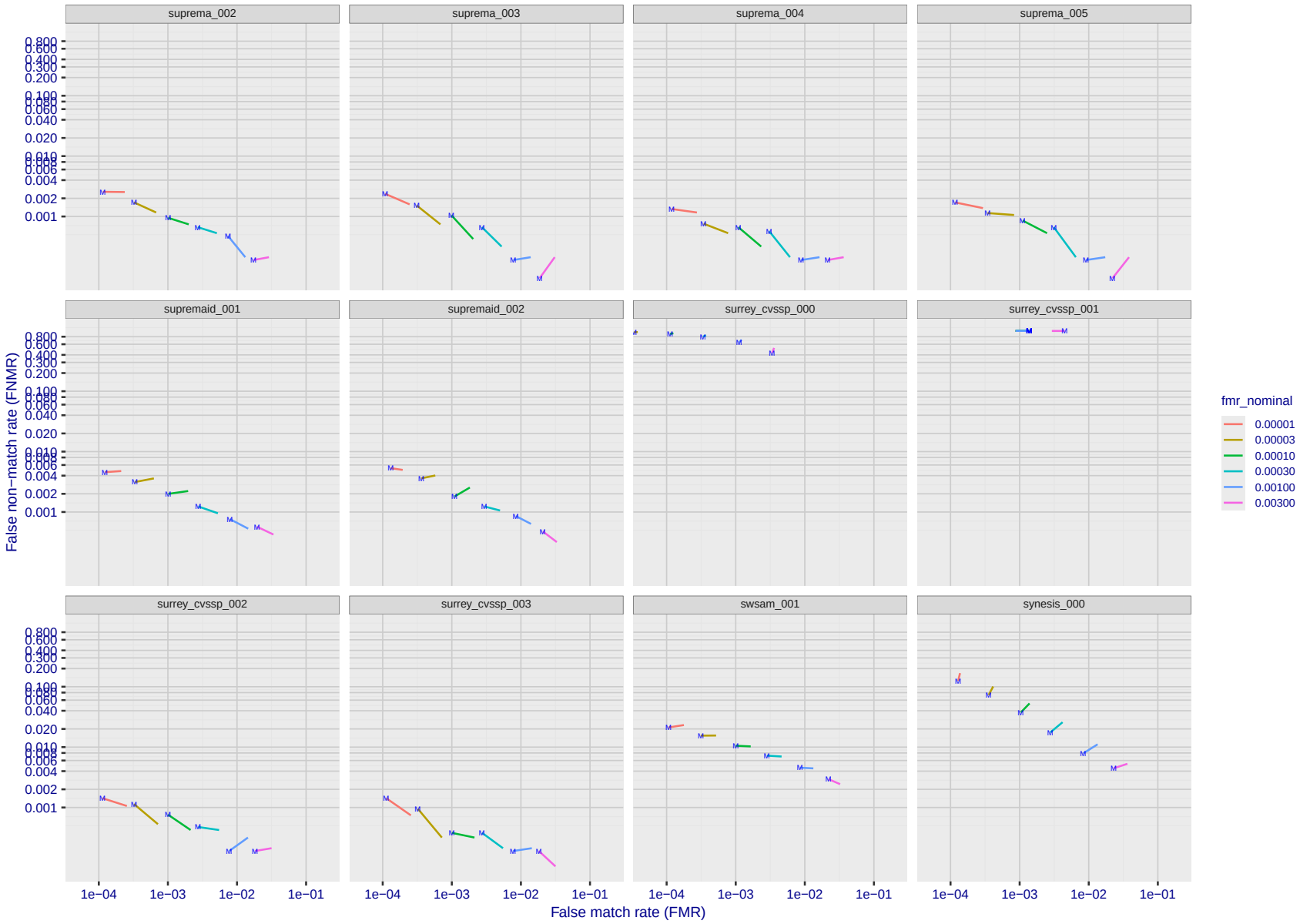

Figure 512: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

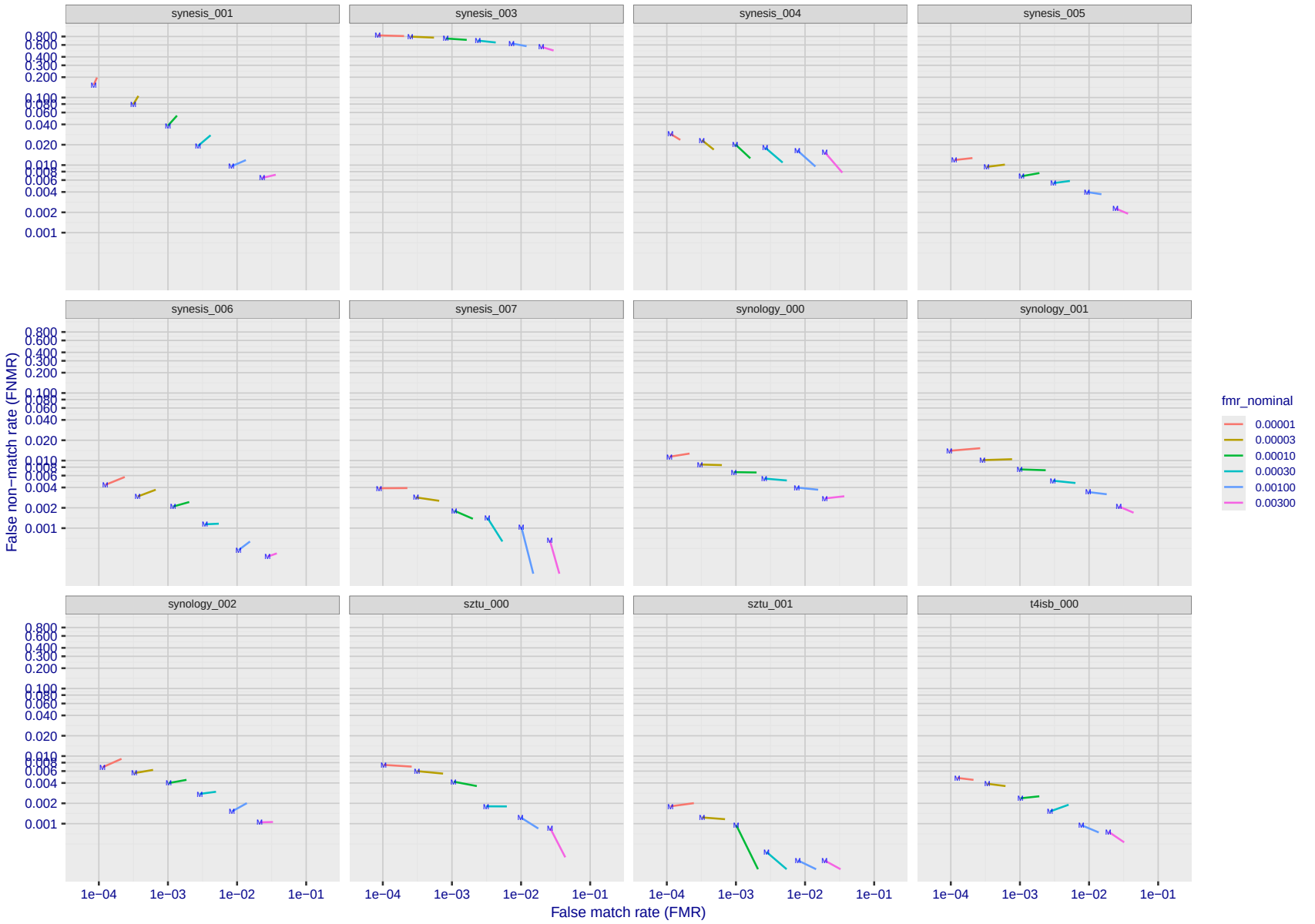

Figure 513: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

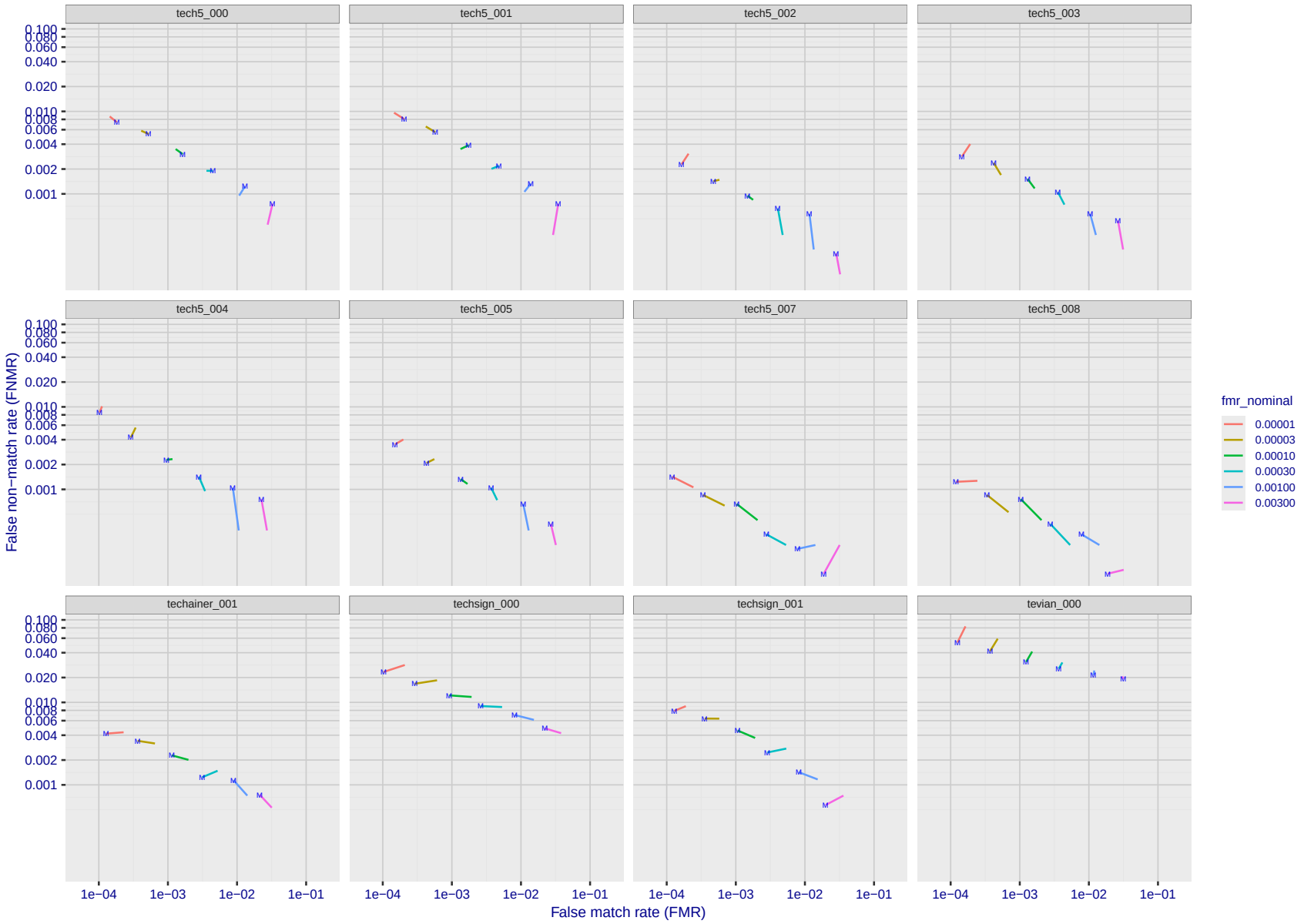

Figure 514: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

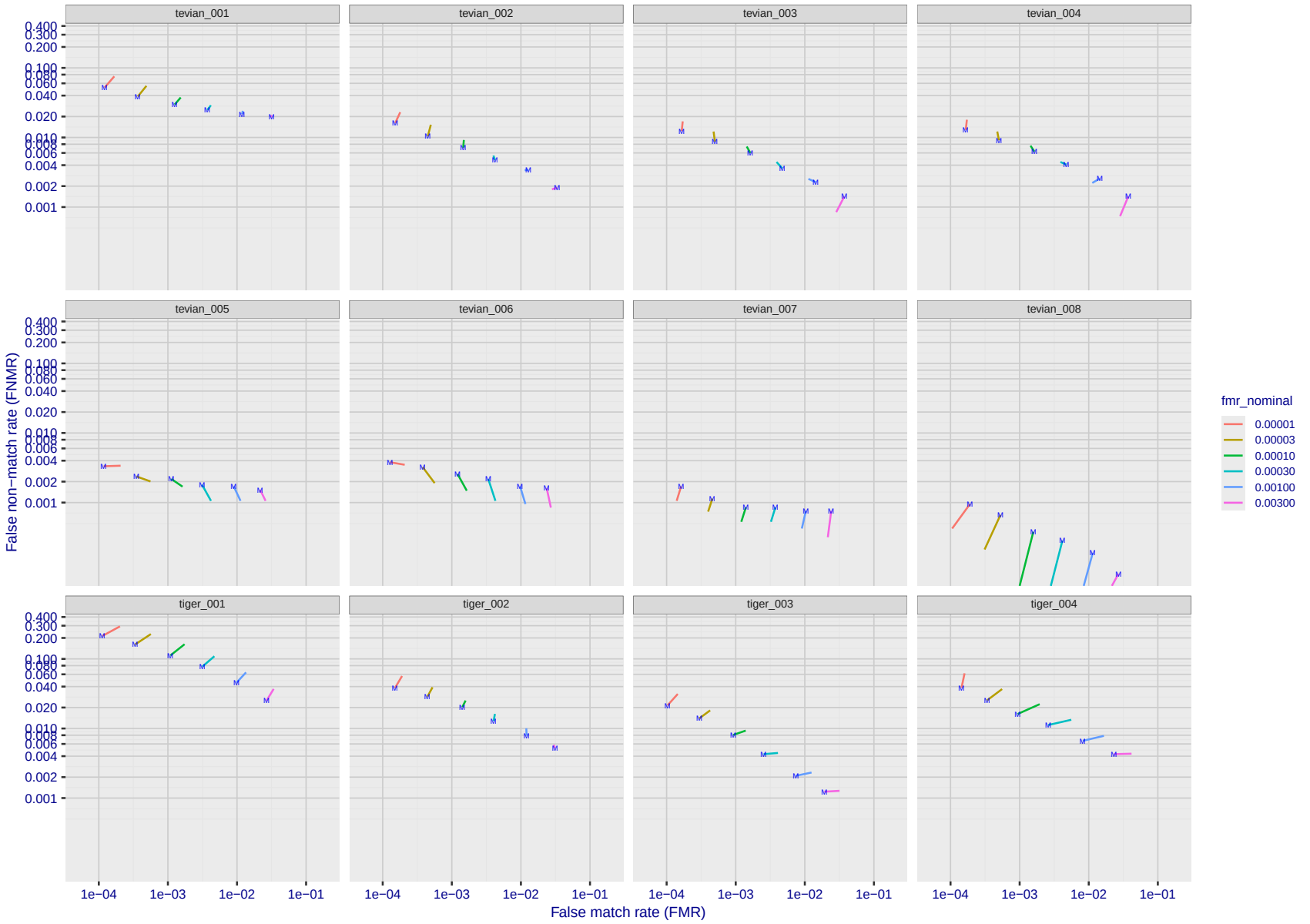

Figure 515: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

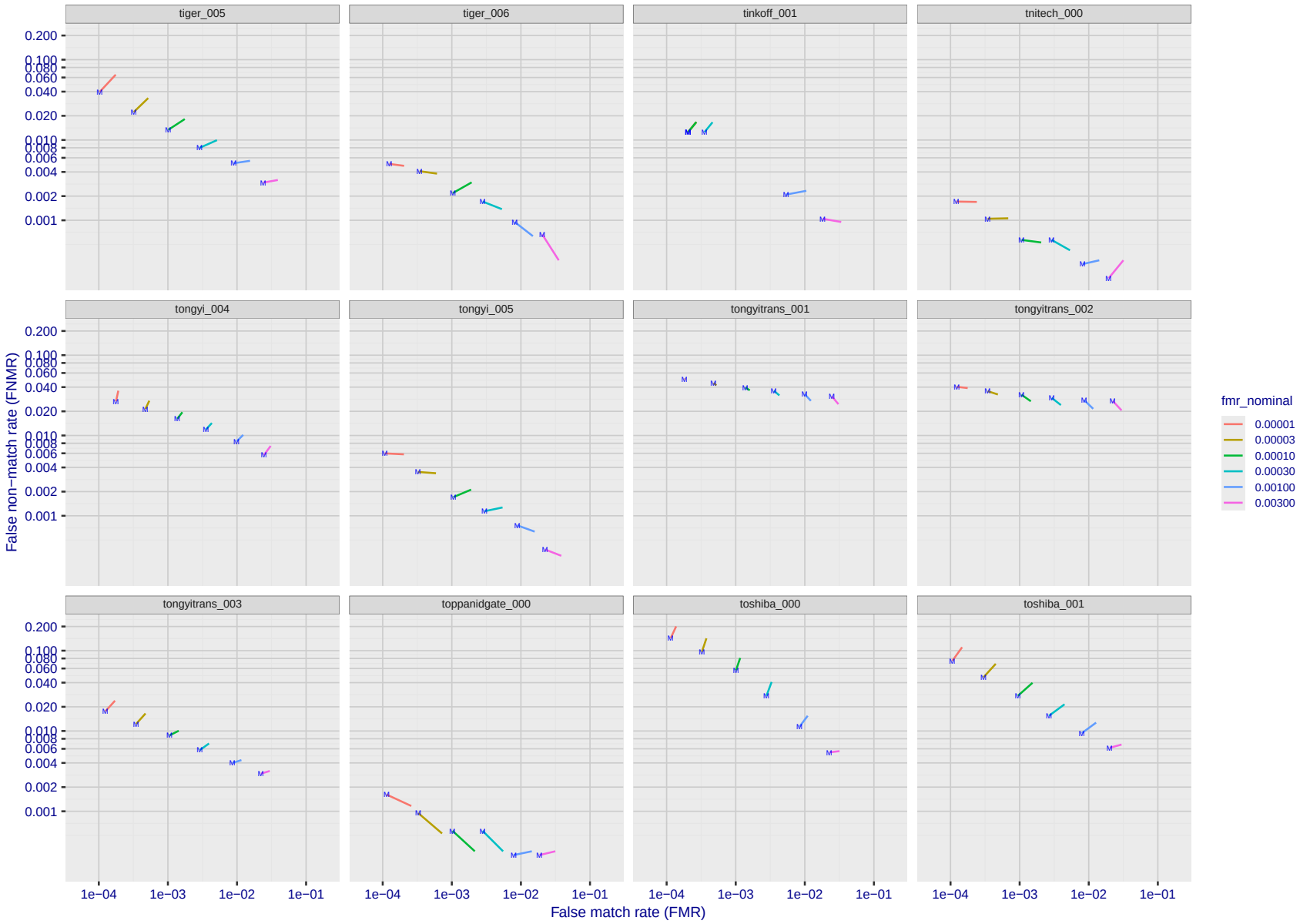

Figure 516: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

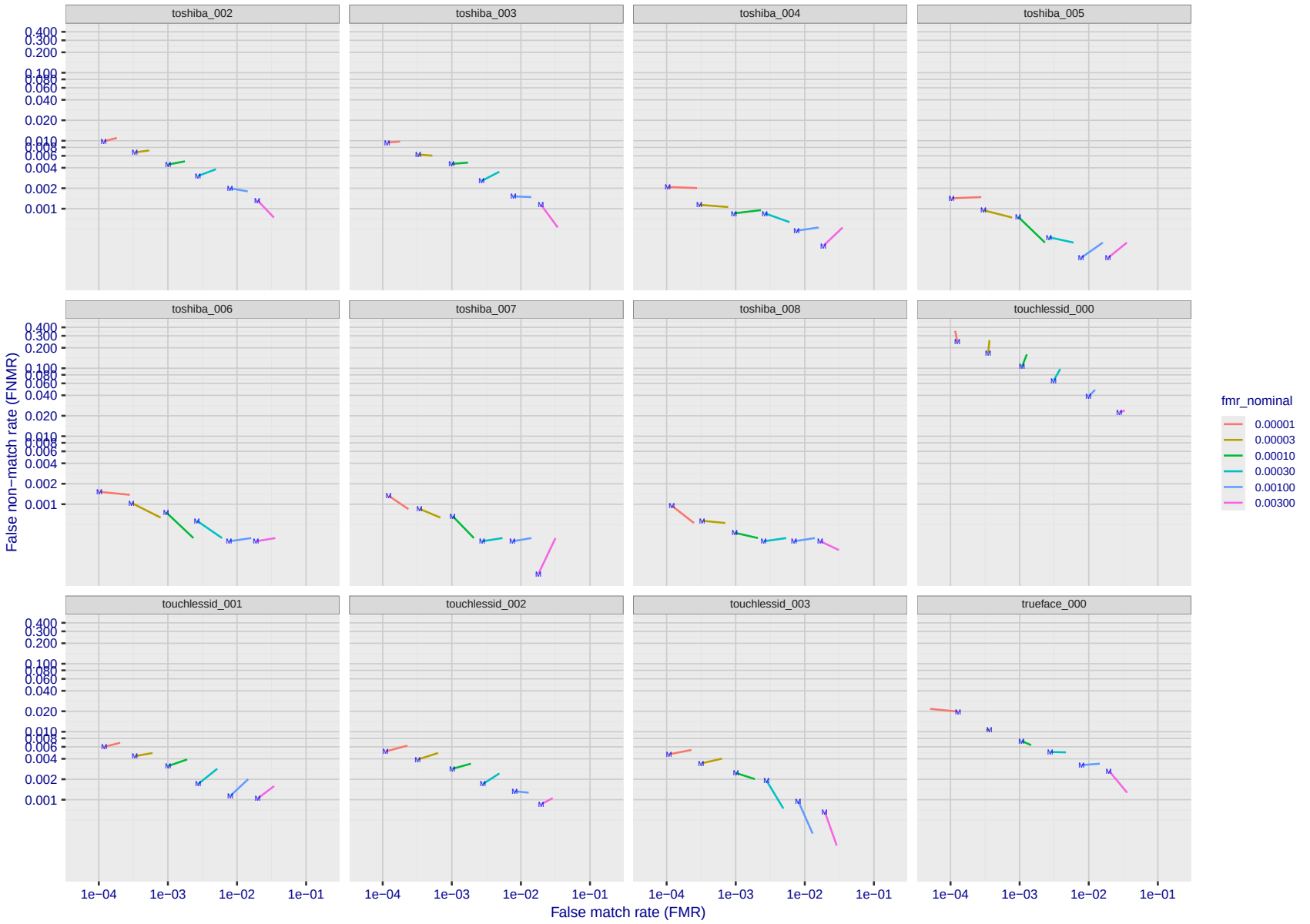

Figure 517: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

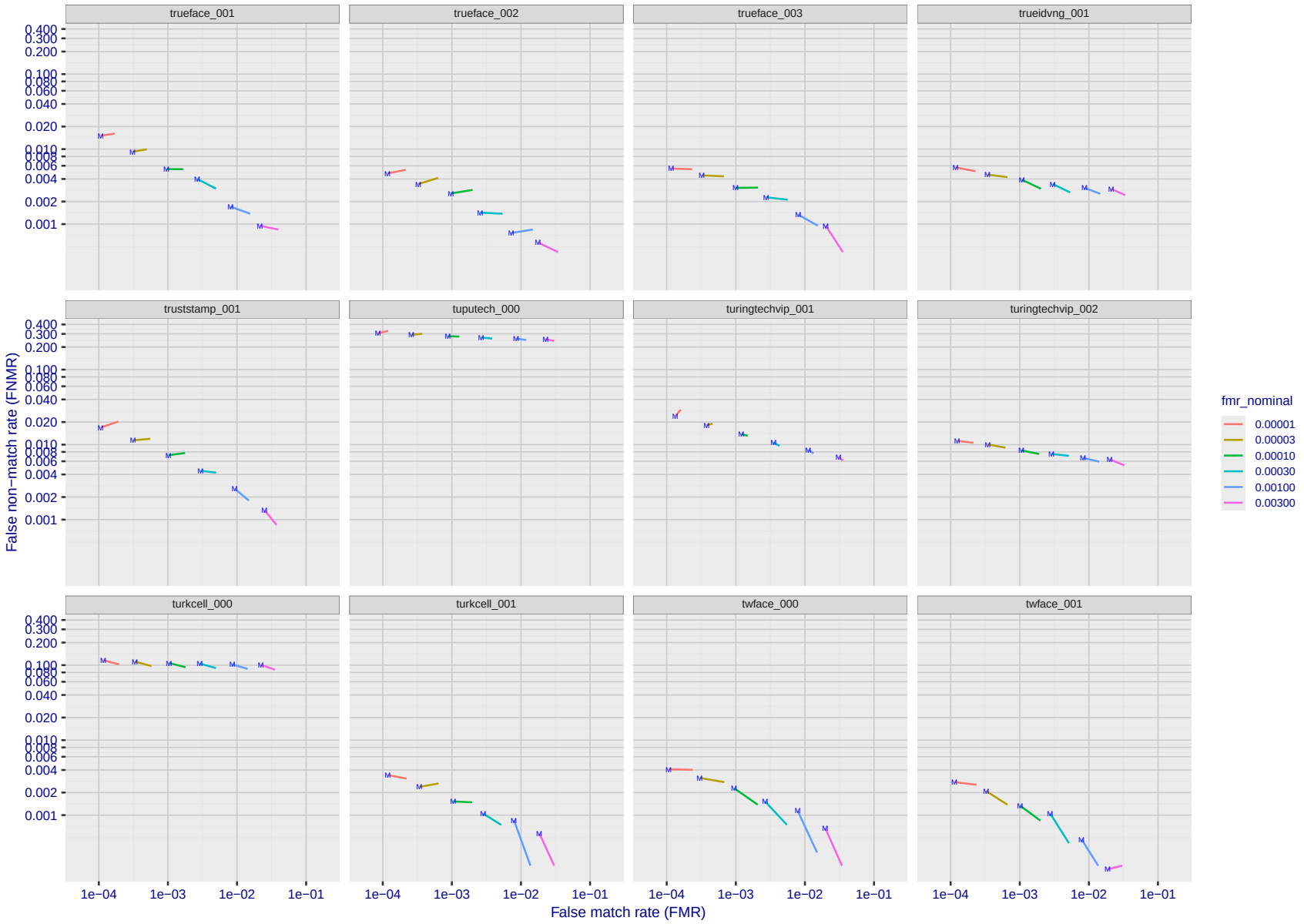

Figure 518: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

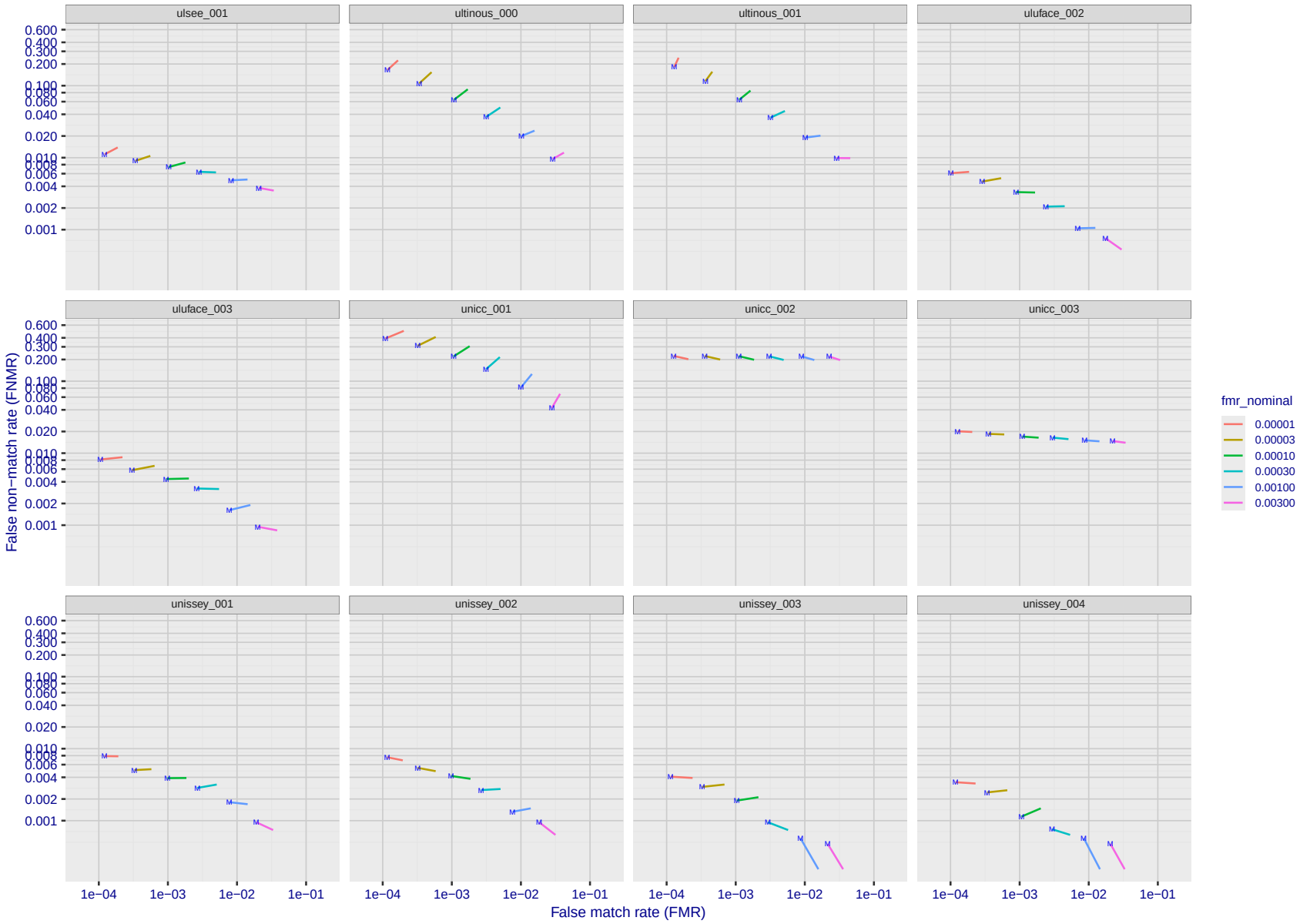

Figure 519: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

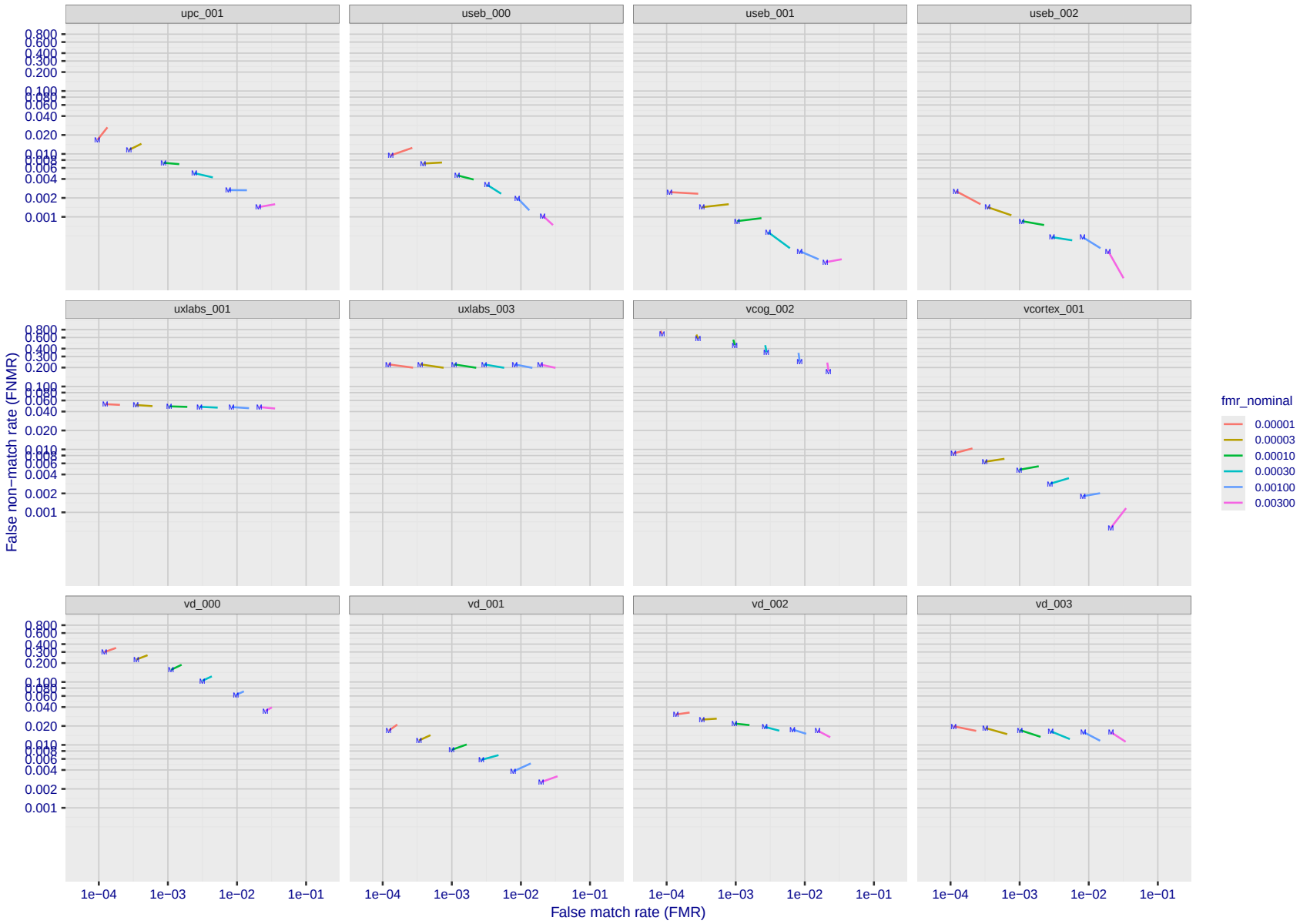

Figure 520: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

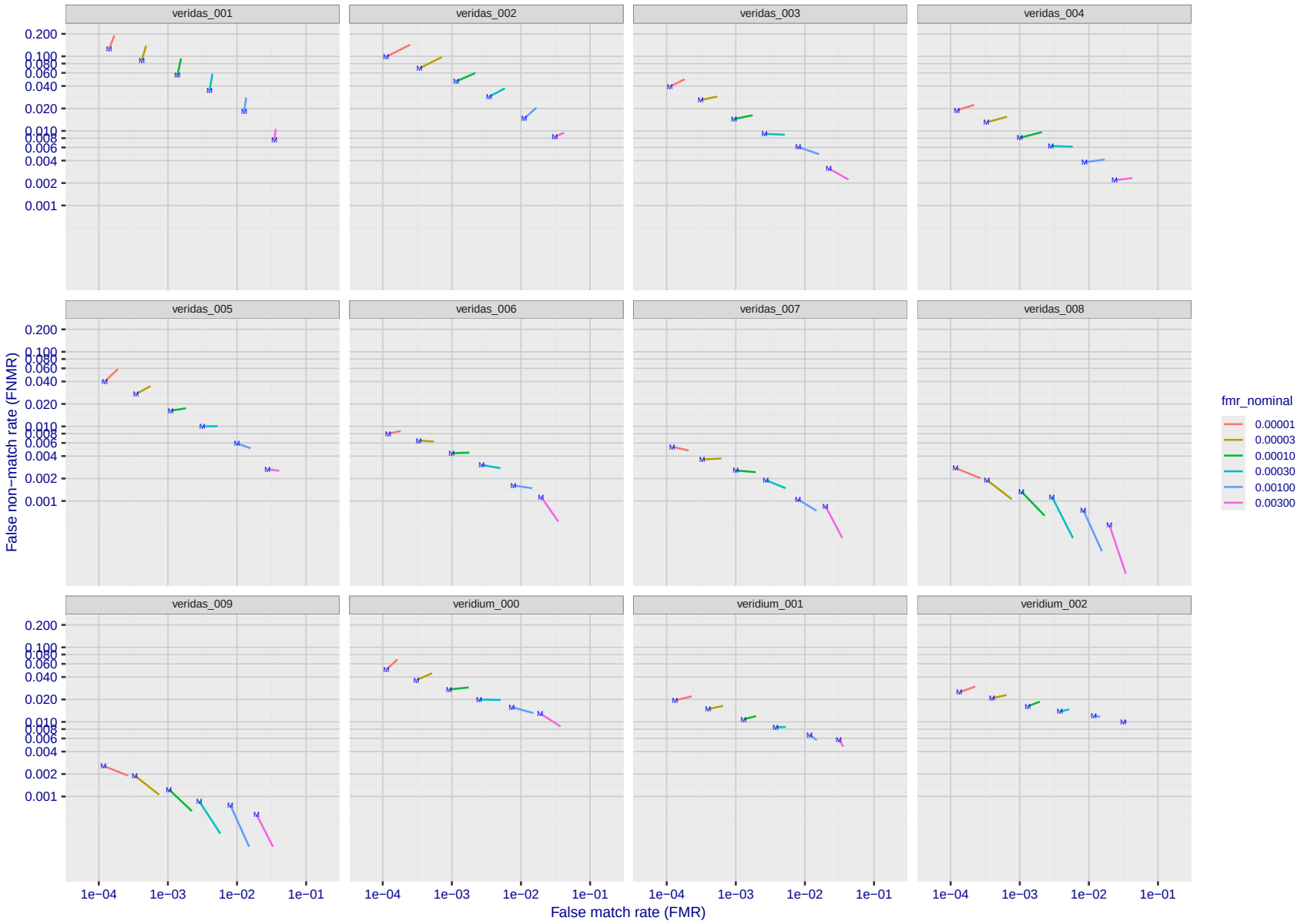

Figure 521: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

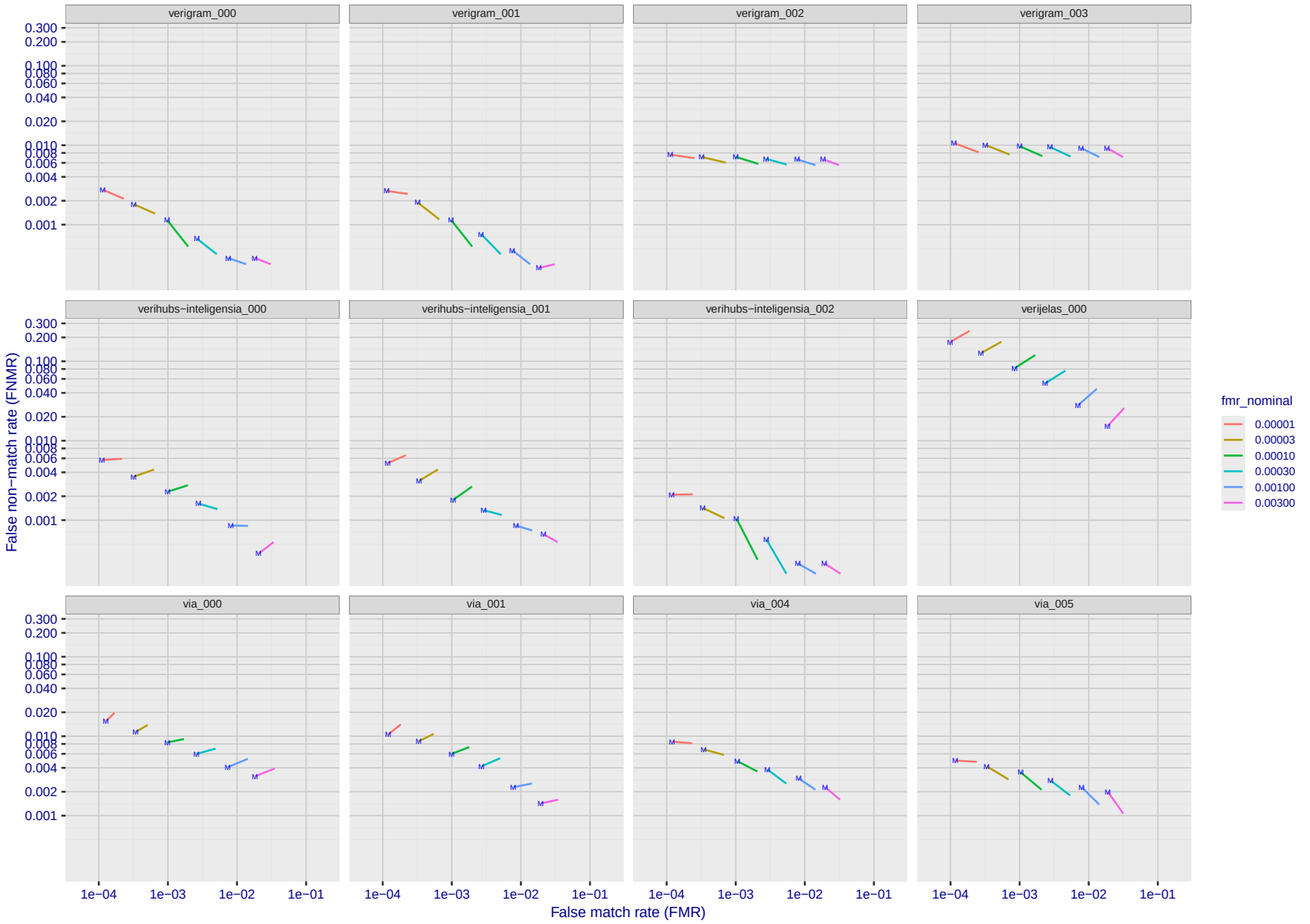

Figure 522: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

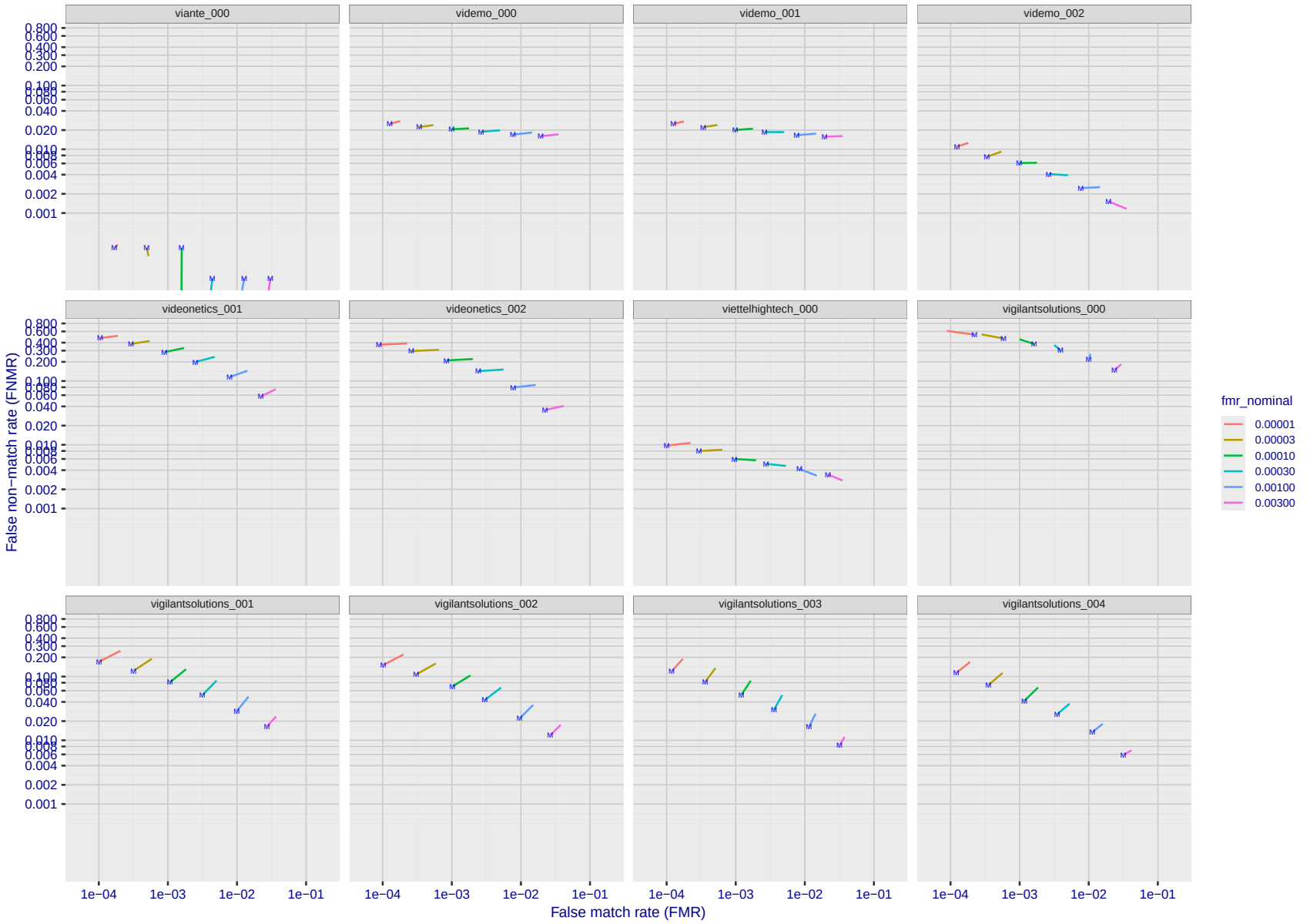

Figure 523: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

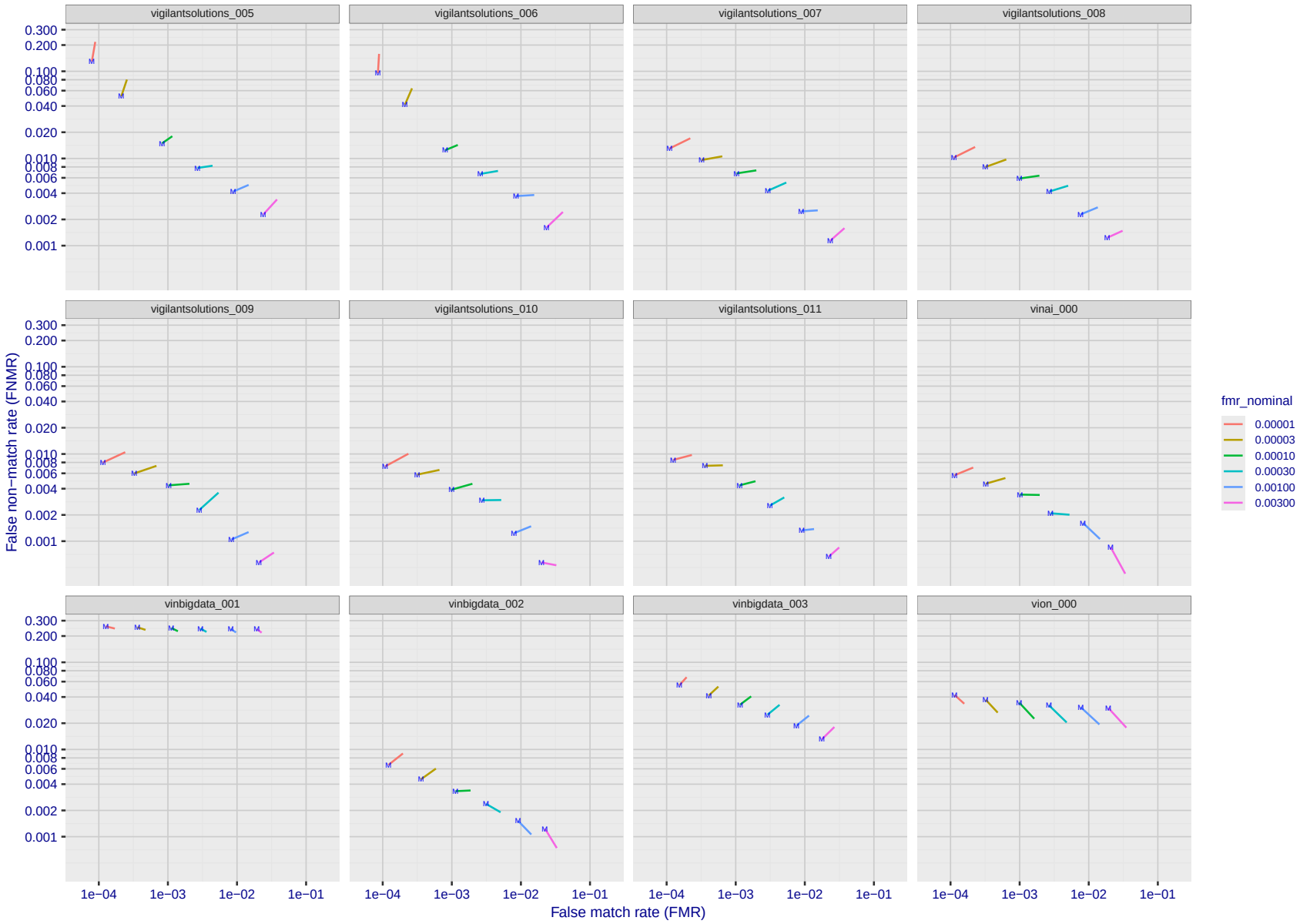

Figure 524: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

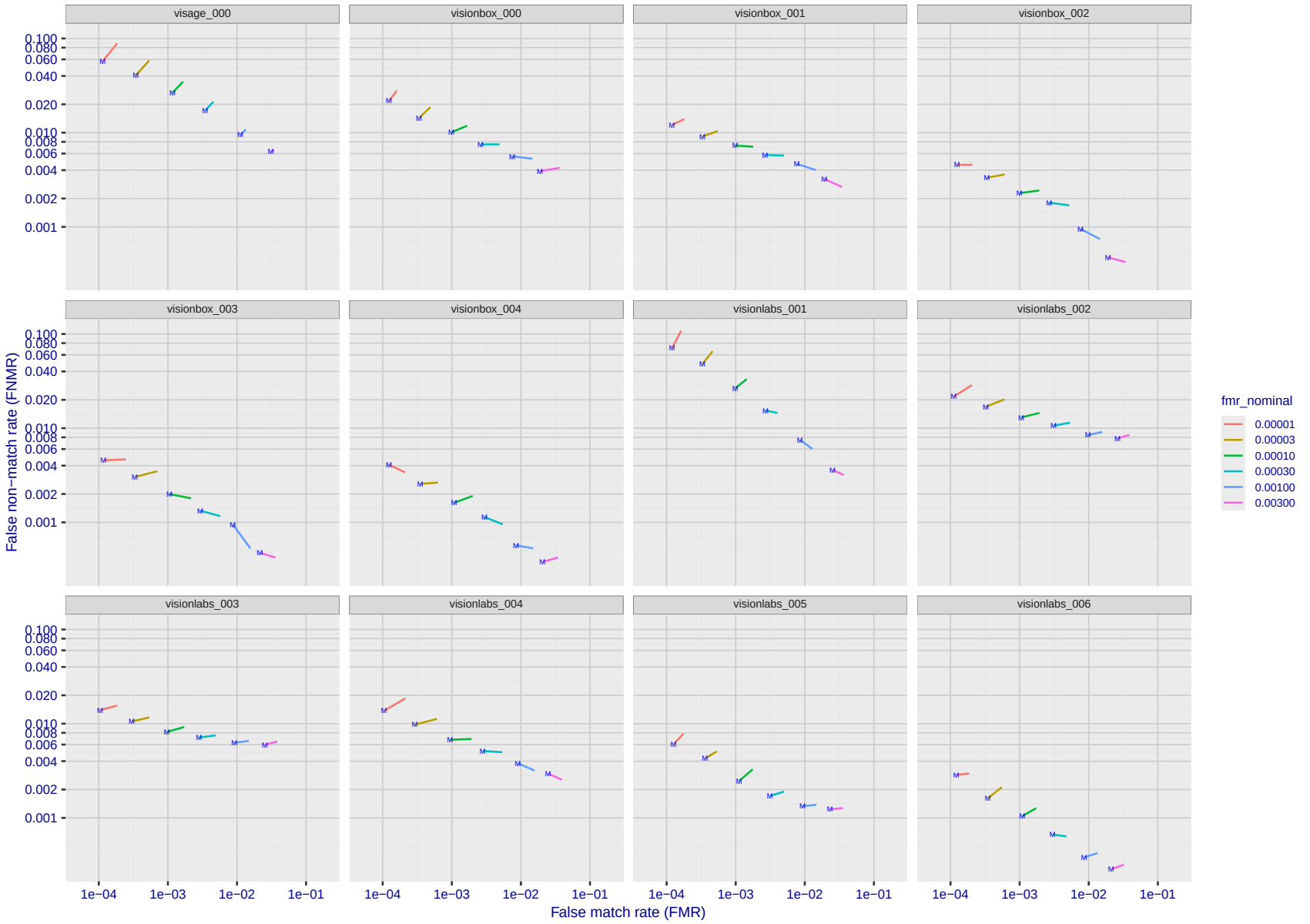

Figure 525: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

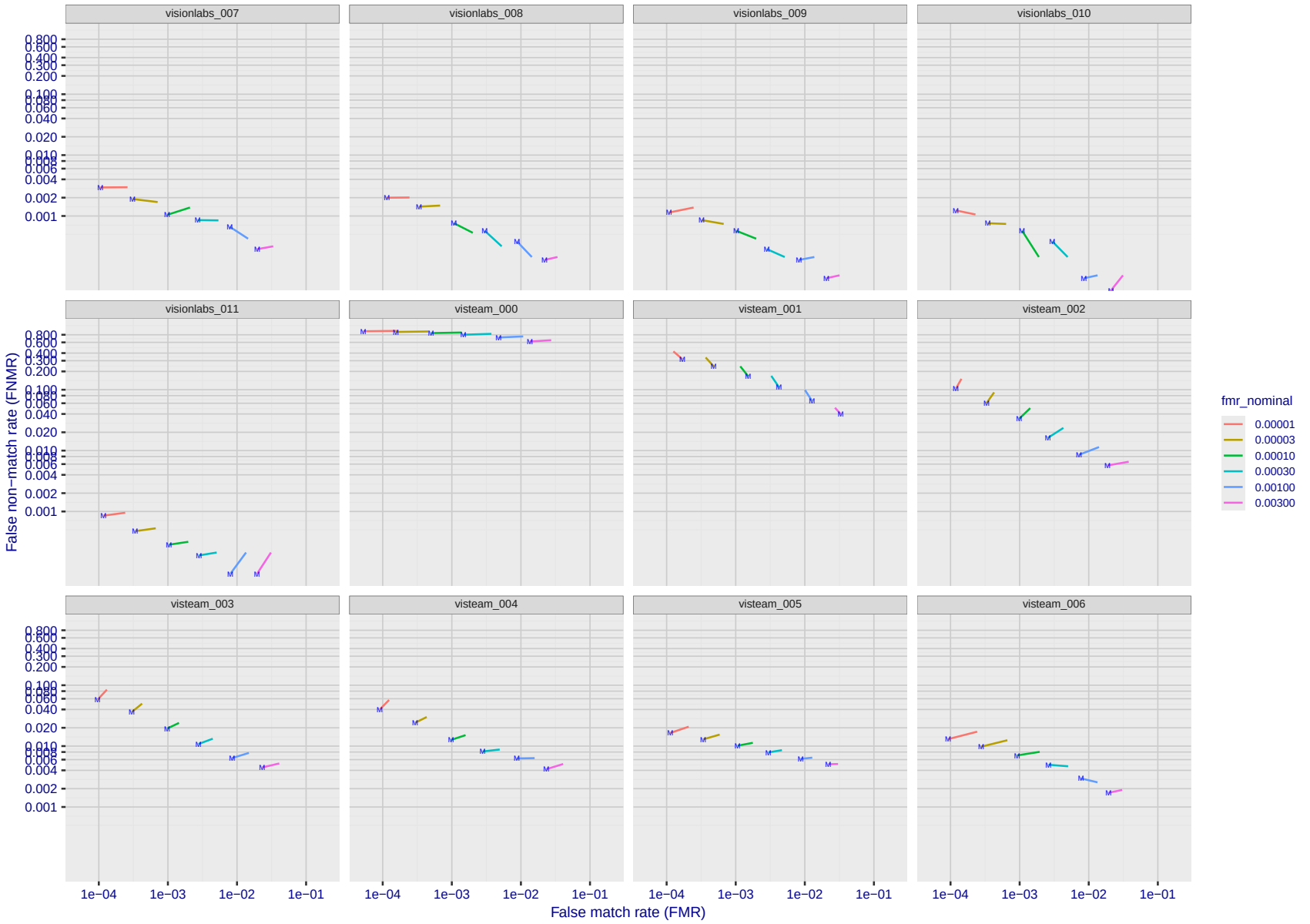

Figure 526: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

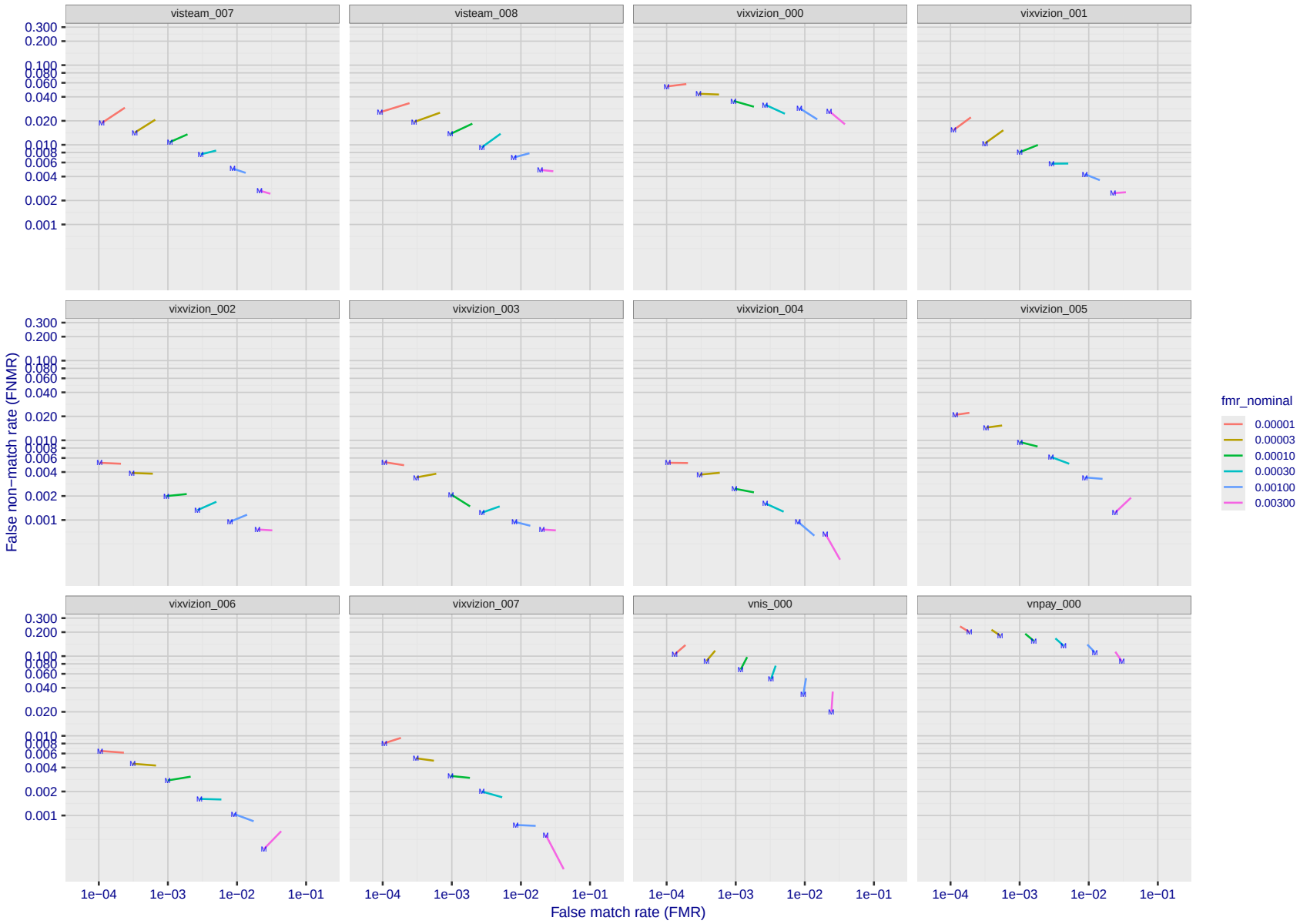

Figure 527: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

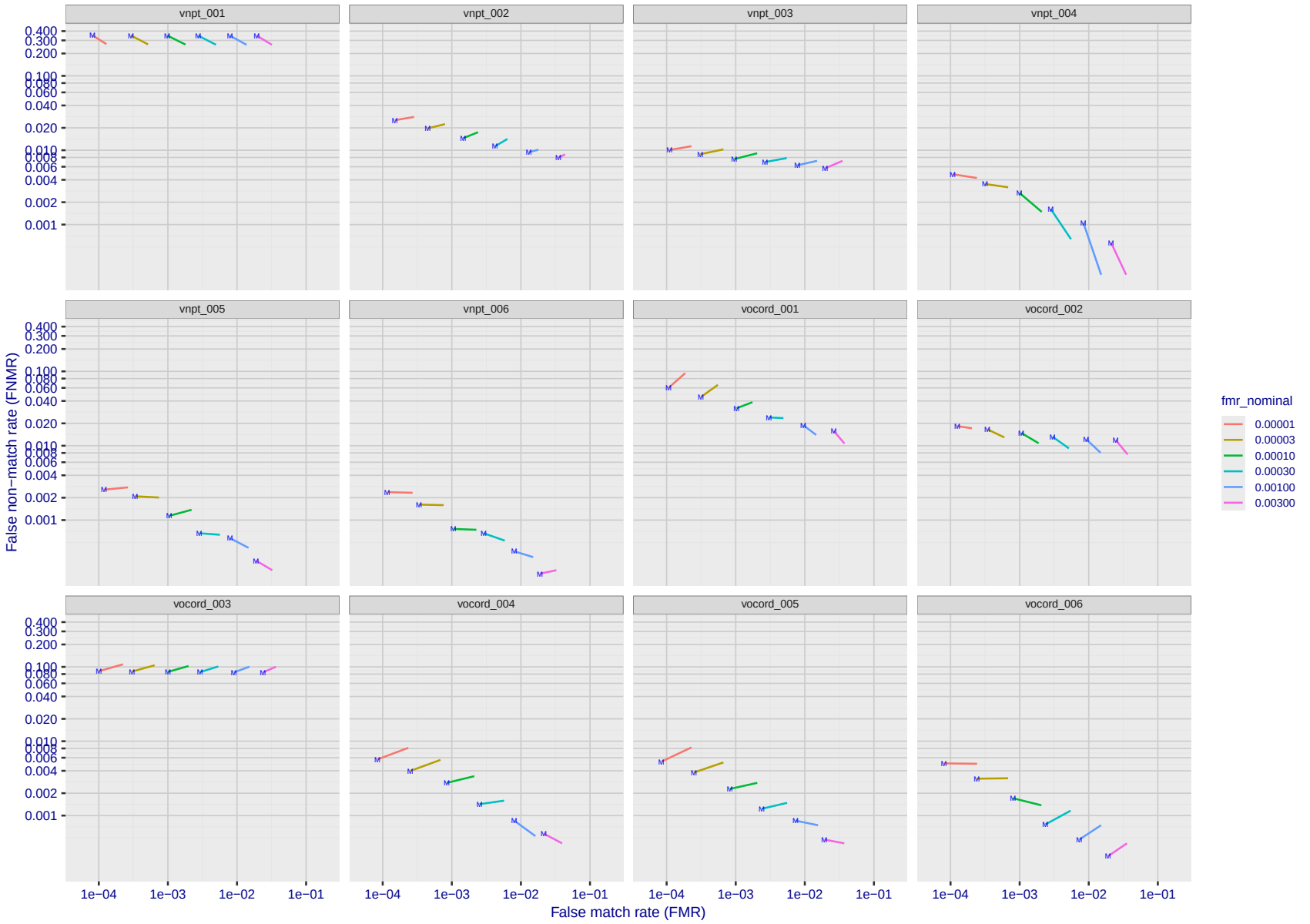

Figure 528: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

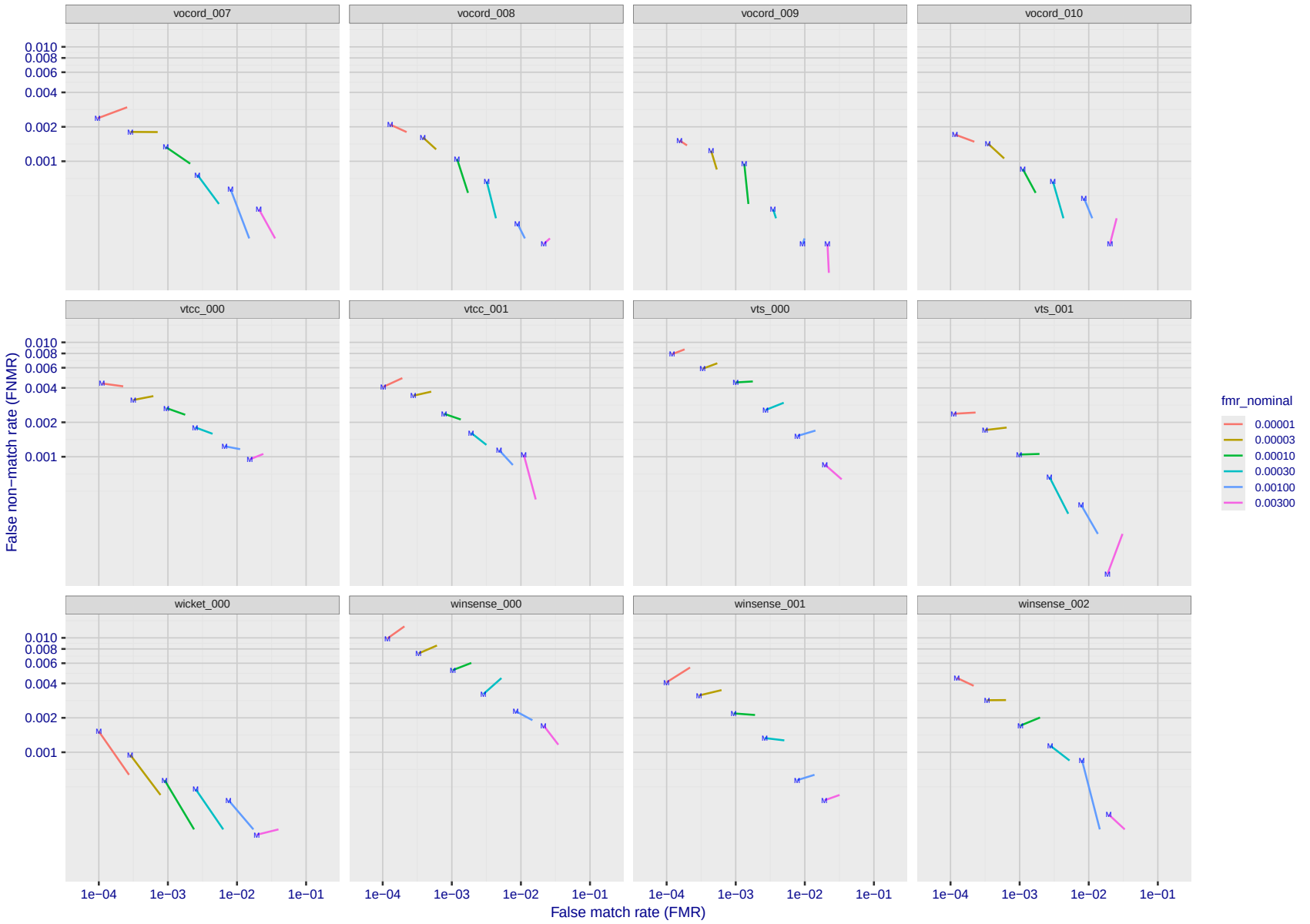

Figure 529: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

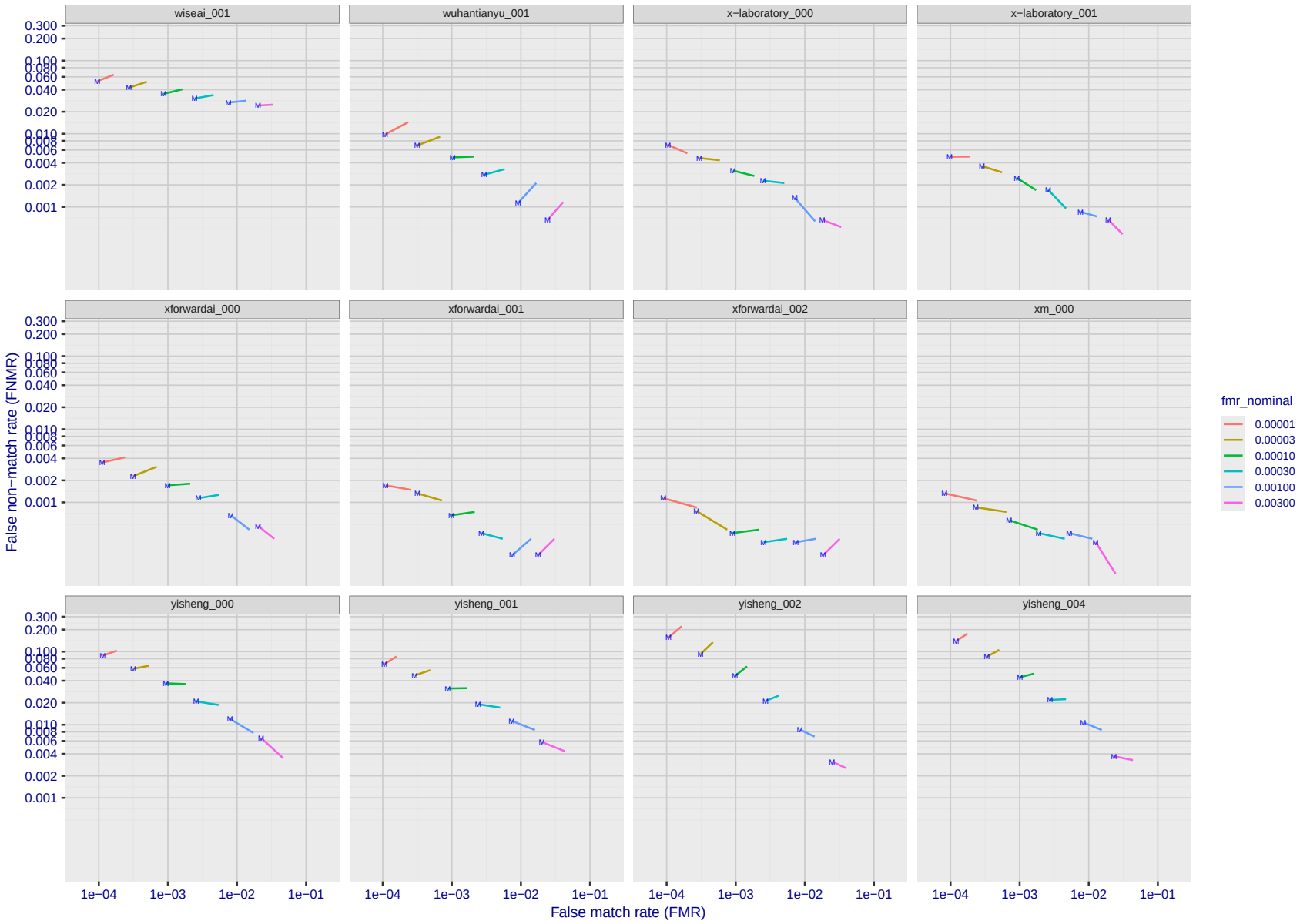

Figure 530: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

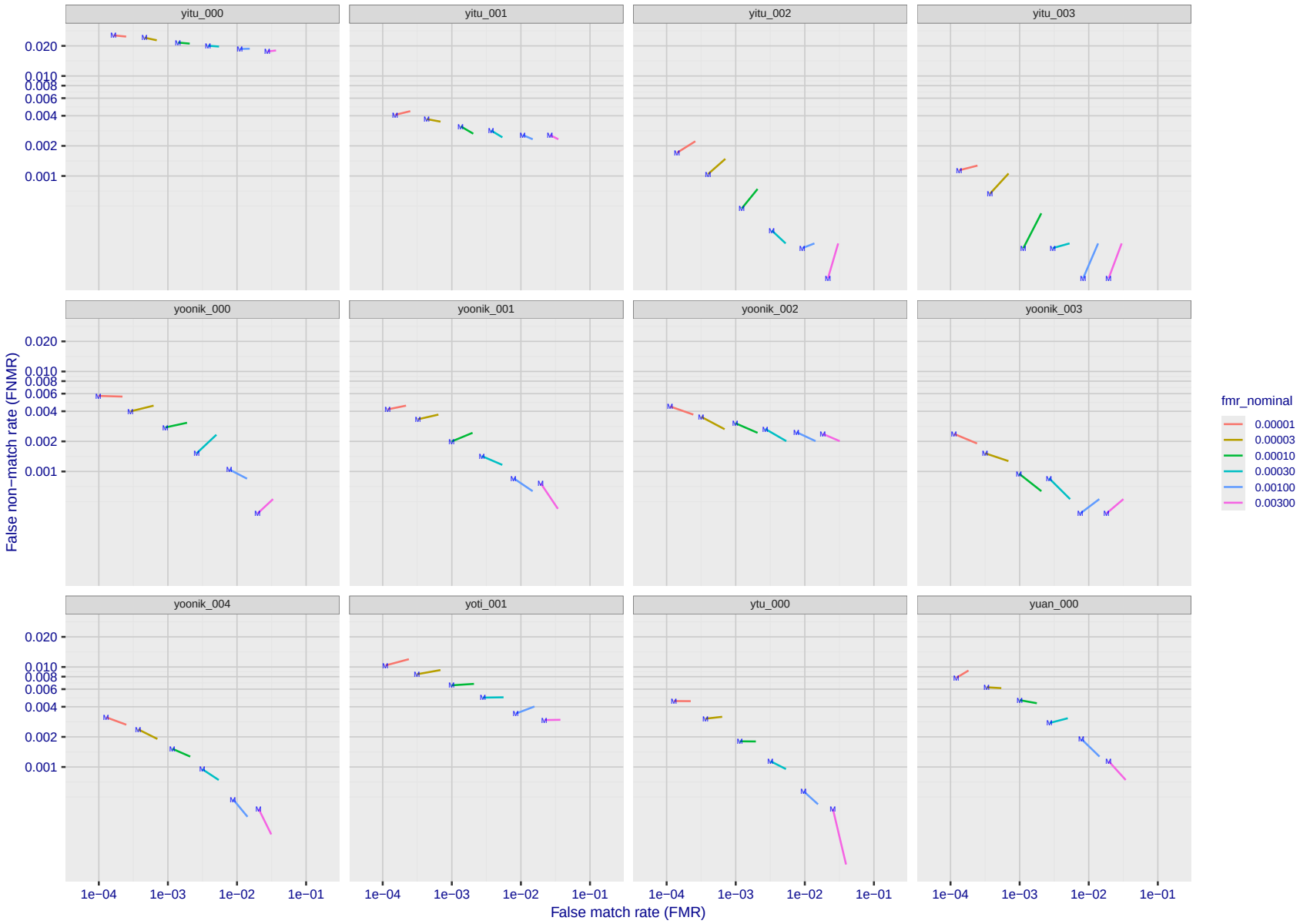

Figure 531: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

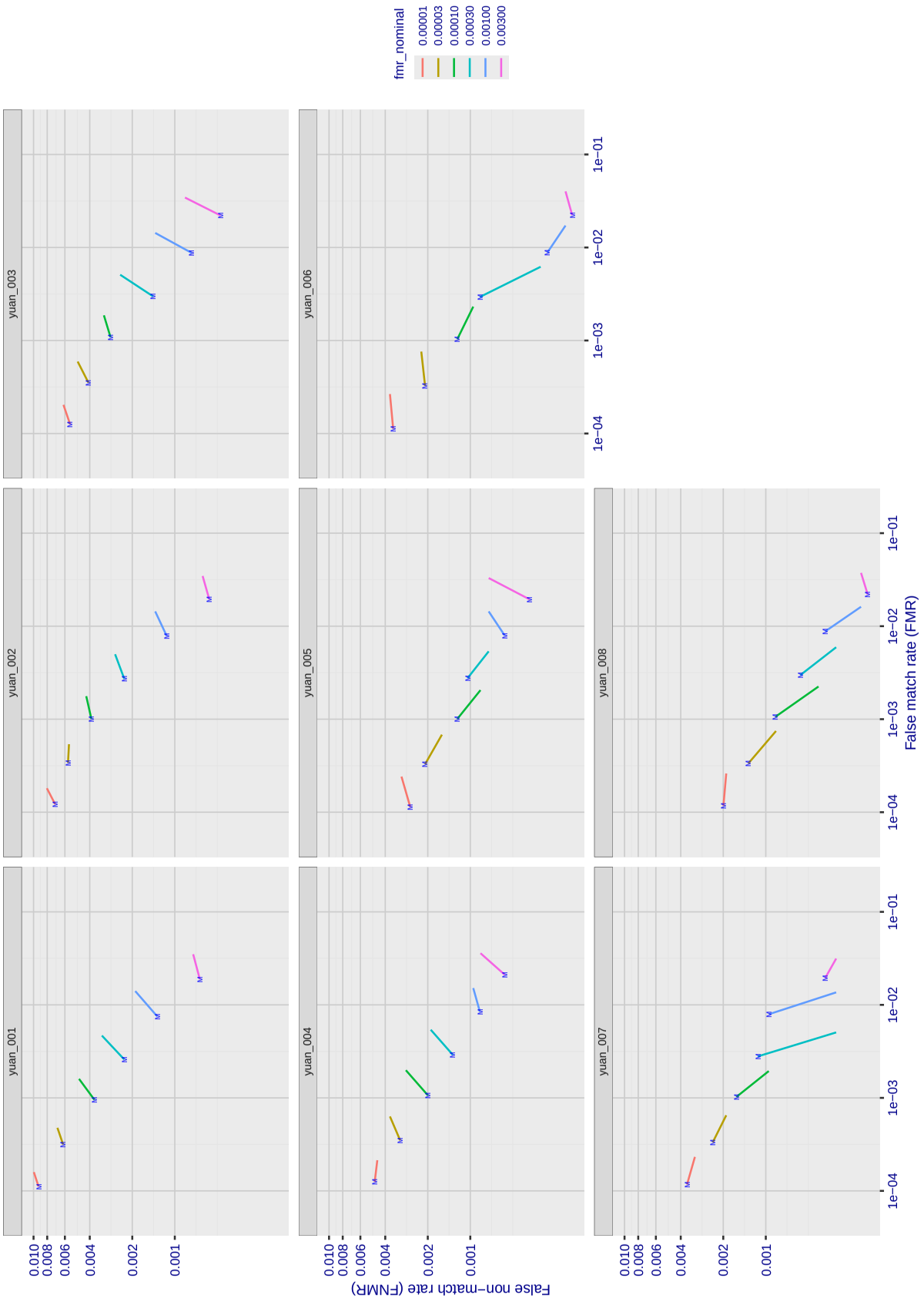

Figure 532: For the visa images, FNMR and FMR at six operating points along the DET characteristic. At each point a line is drawn between (FMR,FNMR)$_{\text{MALE}}$ and (FMR,FNMR)$_{\text{FEMALE}}$ showing how which sex has lower FMR and/or FNMR. The "M" label denotes male, the other end of the line corresponds to female. The six operating thresholds are selected to give the nominal false match rates given in the legend, and are computed over all impostor pairs regardless of age, sex, and place of birth. The plotted FMR values are broadly an order of magnitude larger than the nominal rates because FMR is computed over demographically-matched impostor pairs i.e individuals of the same sex, from the same geographic region (see section 3.6.1), and the same age group (see section 3.6.2).

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

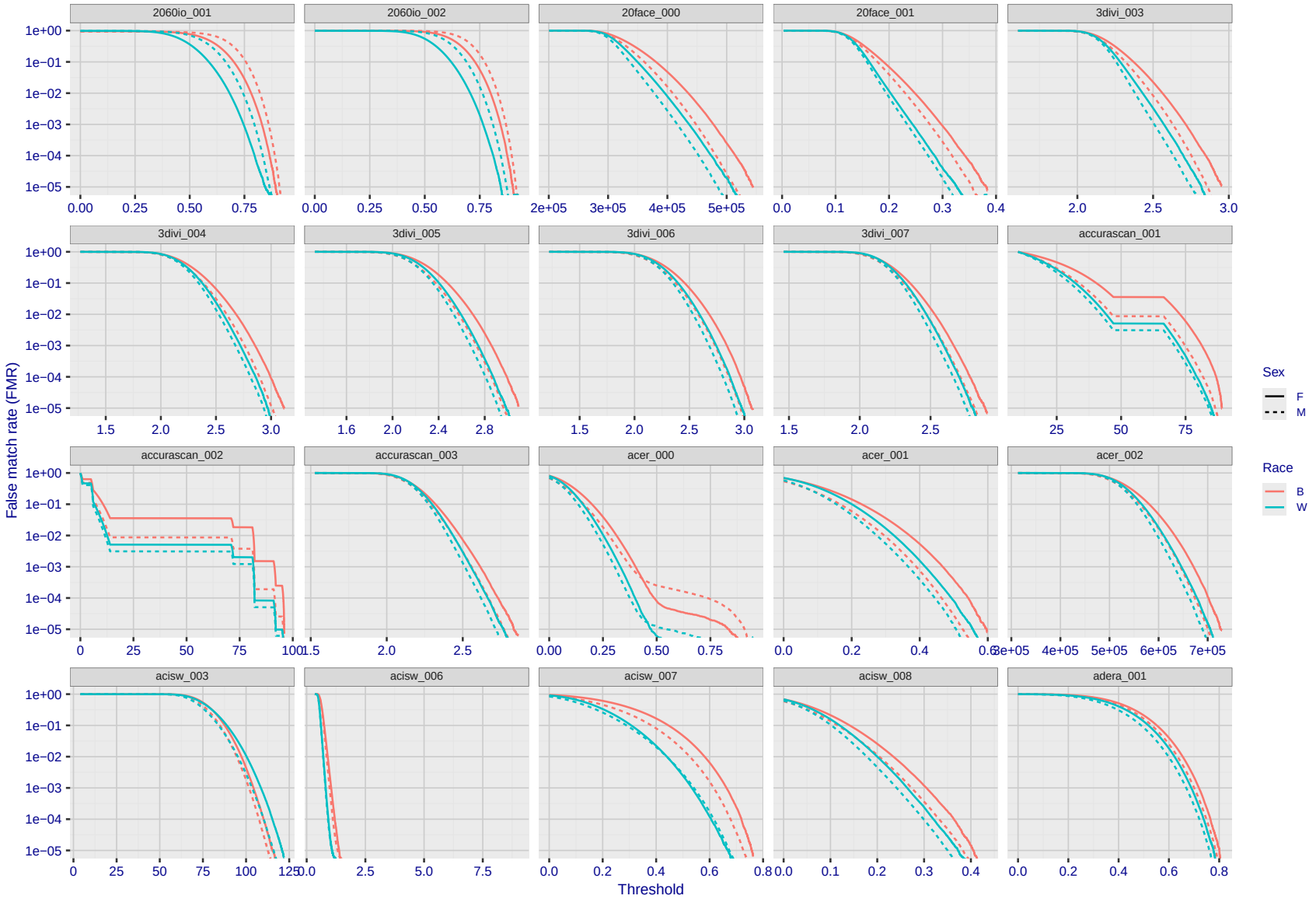

Figure 533: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

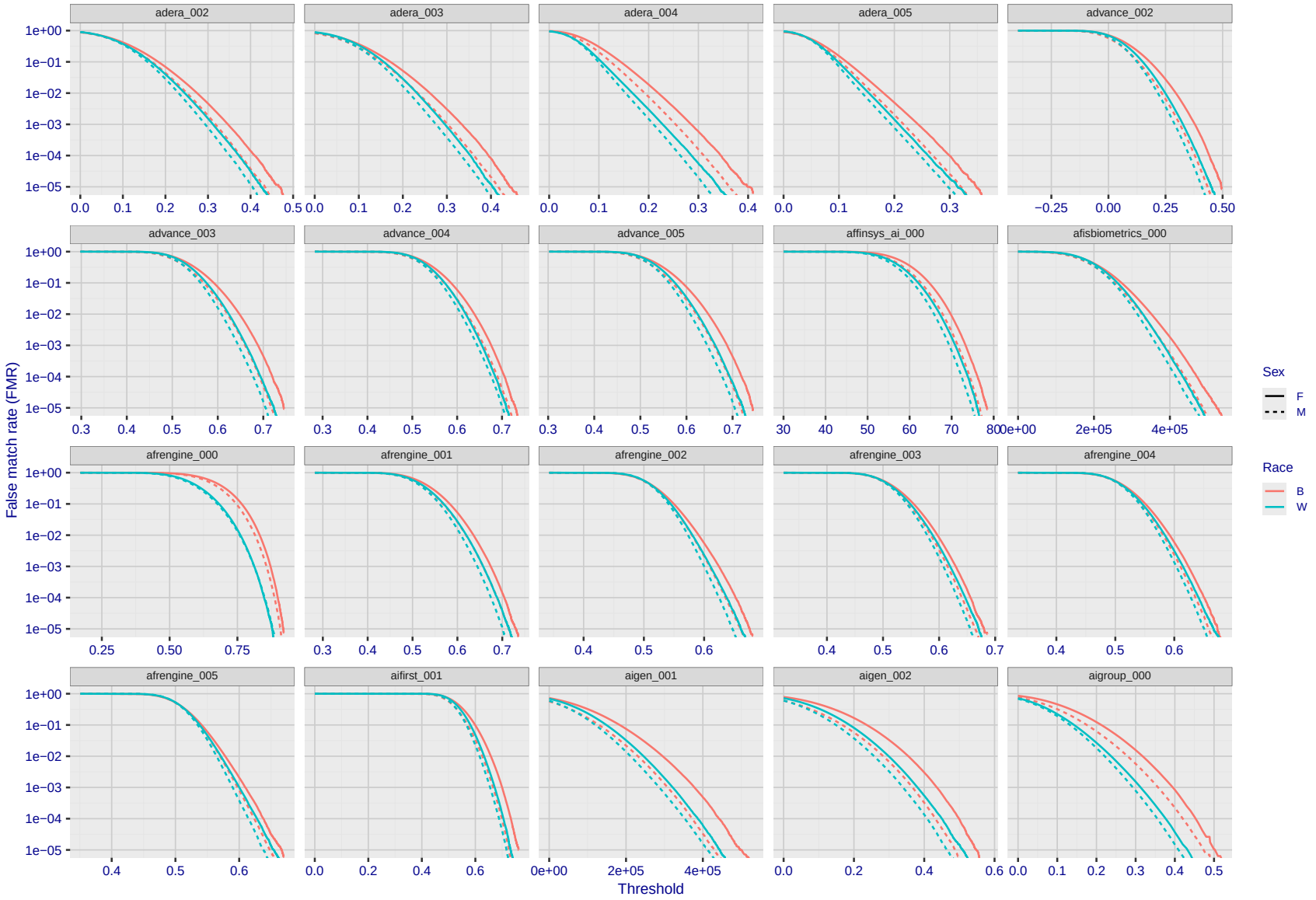

Figure 534: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

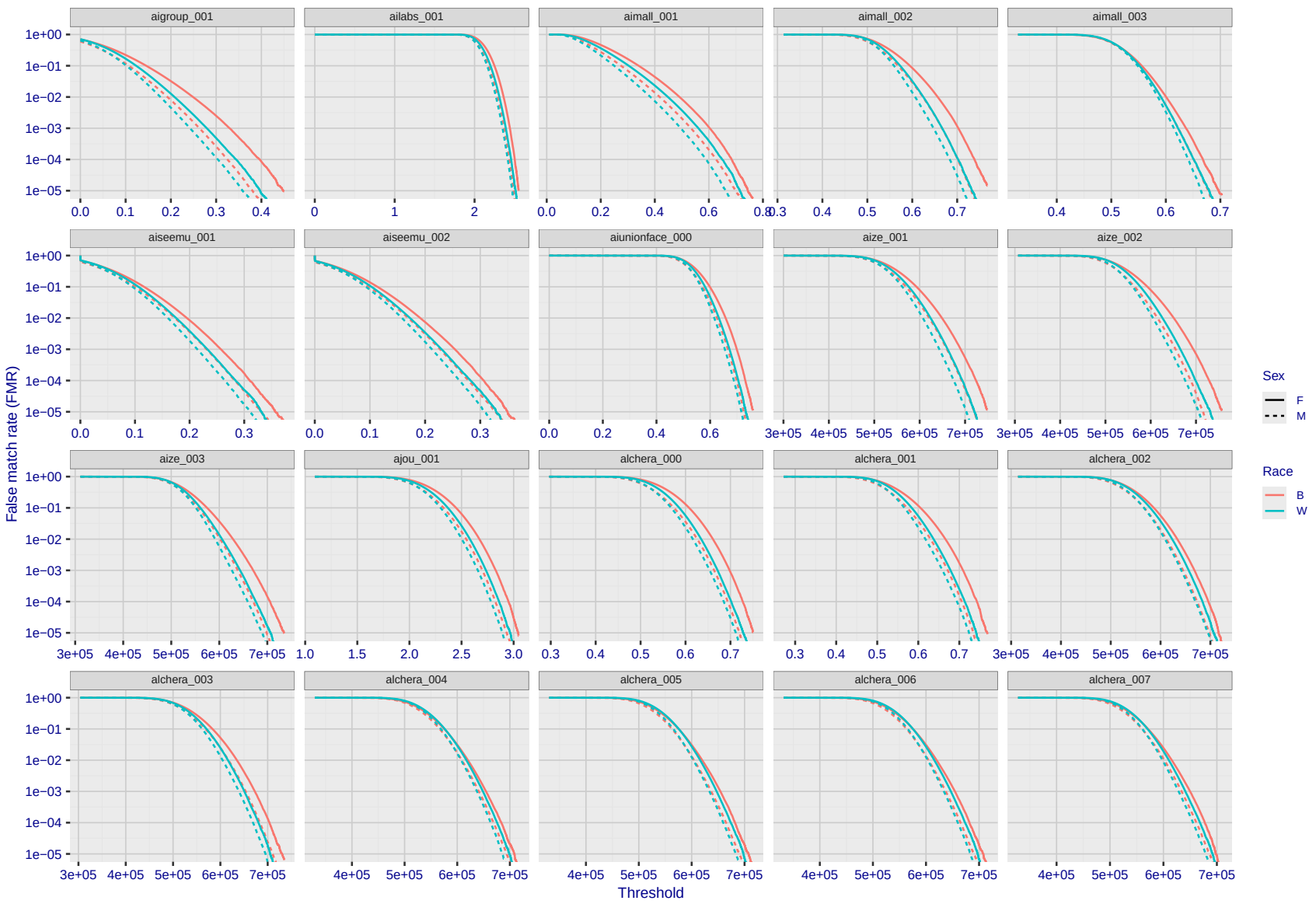

Figure 535: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

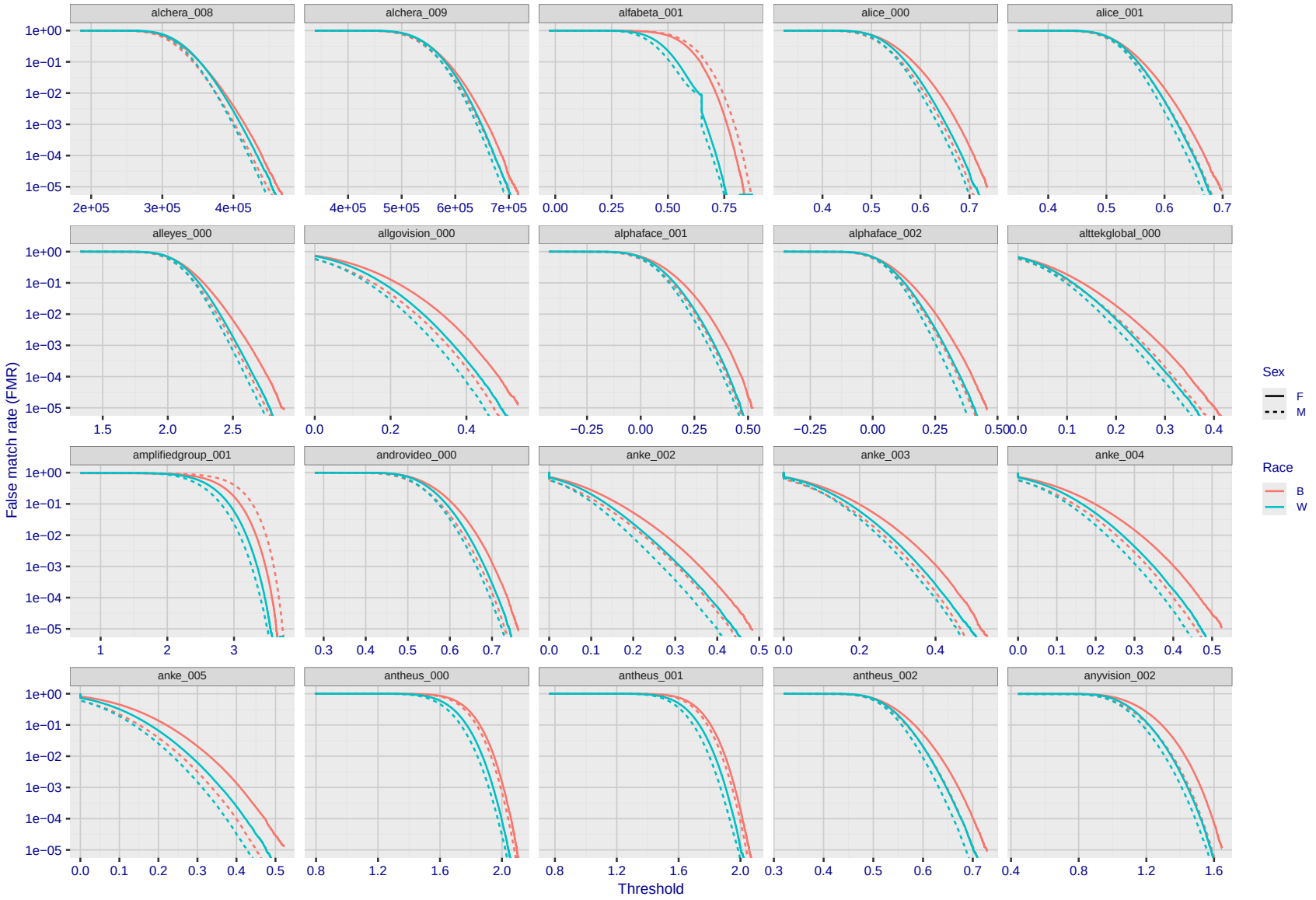

Figure 536: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

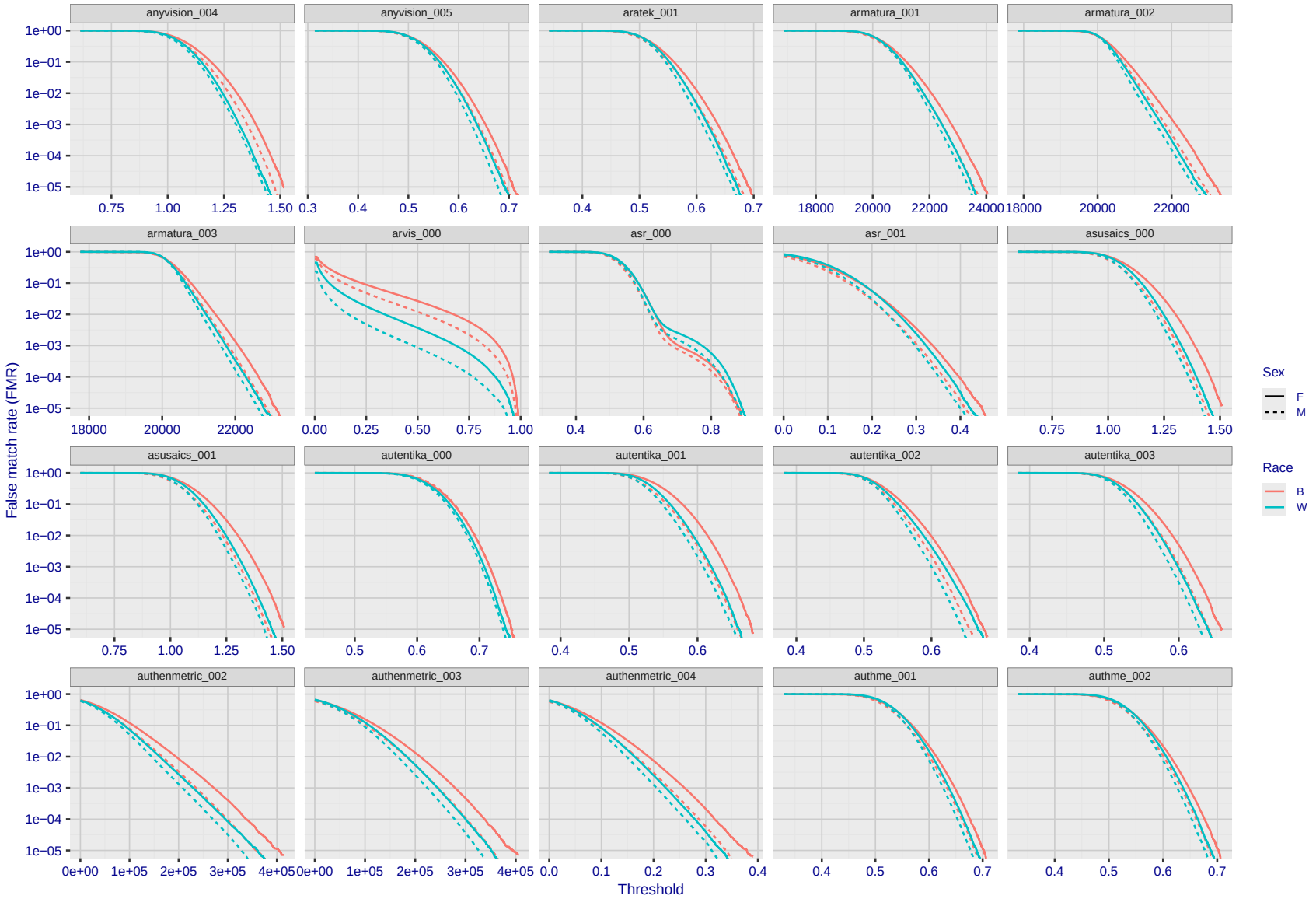

Figure 537: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

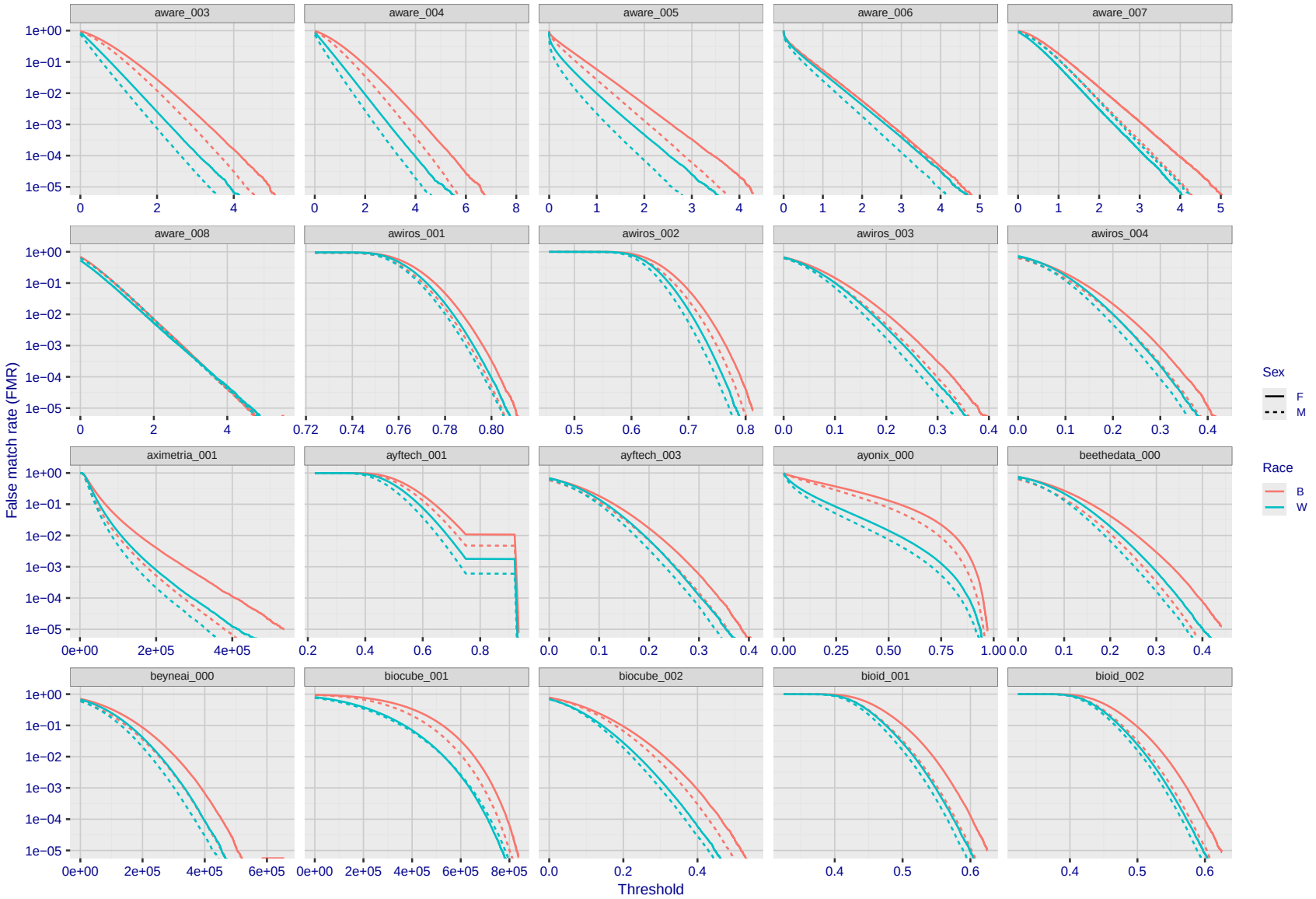

Figure 538: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

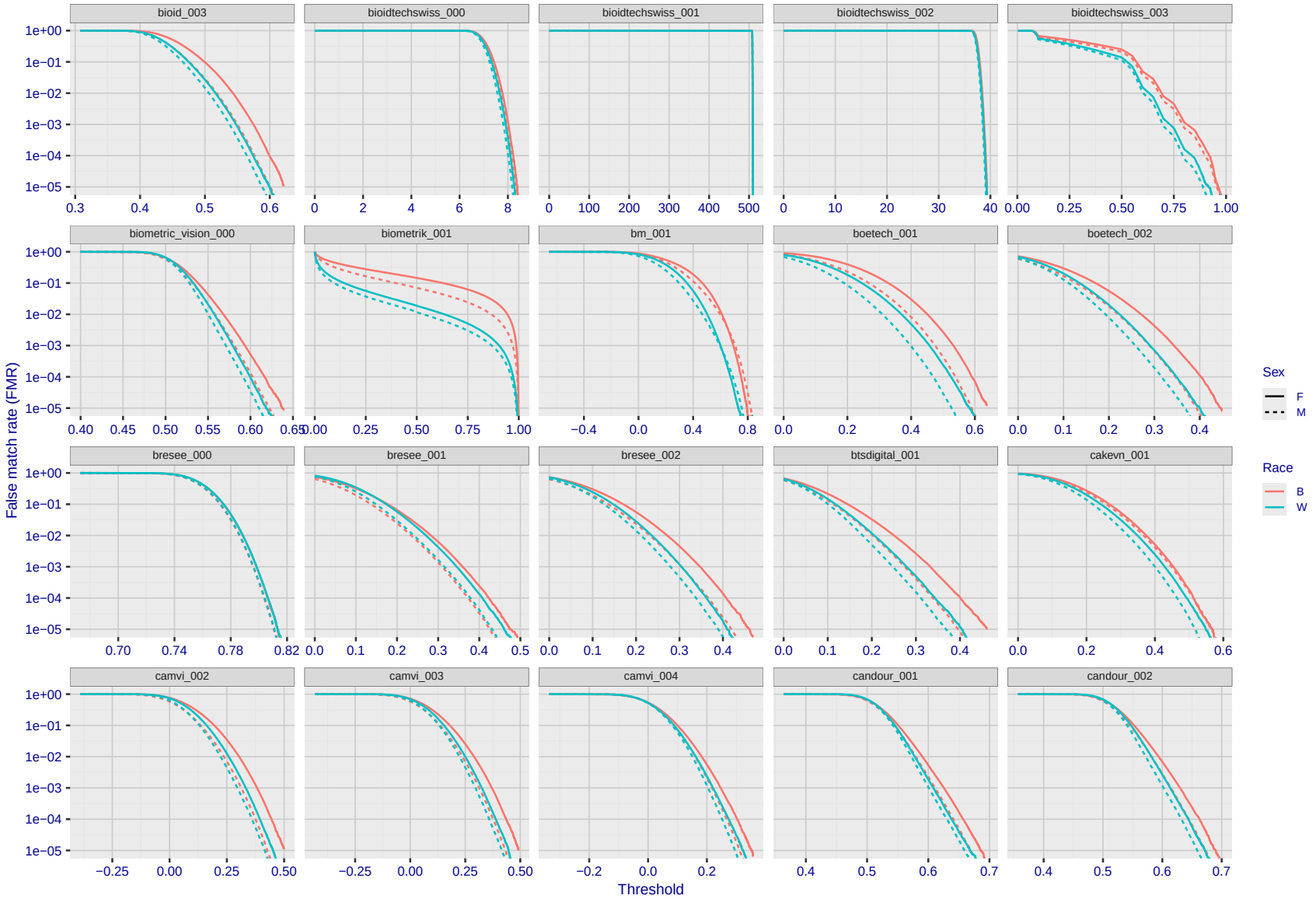

Figure 539: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

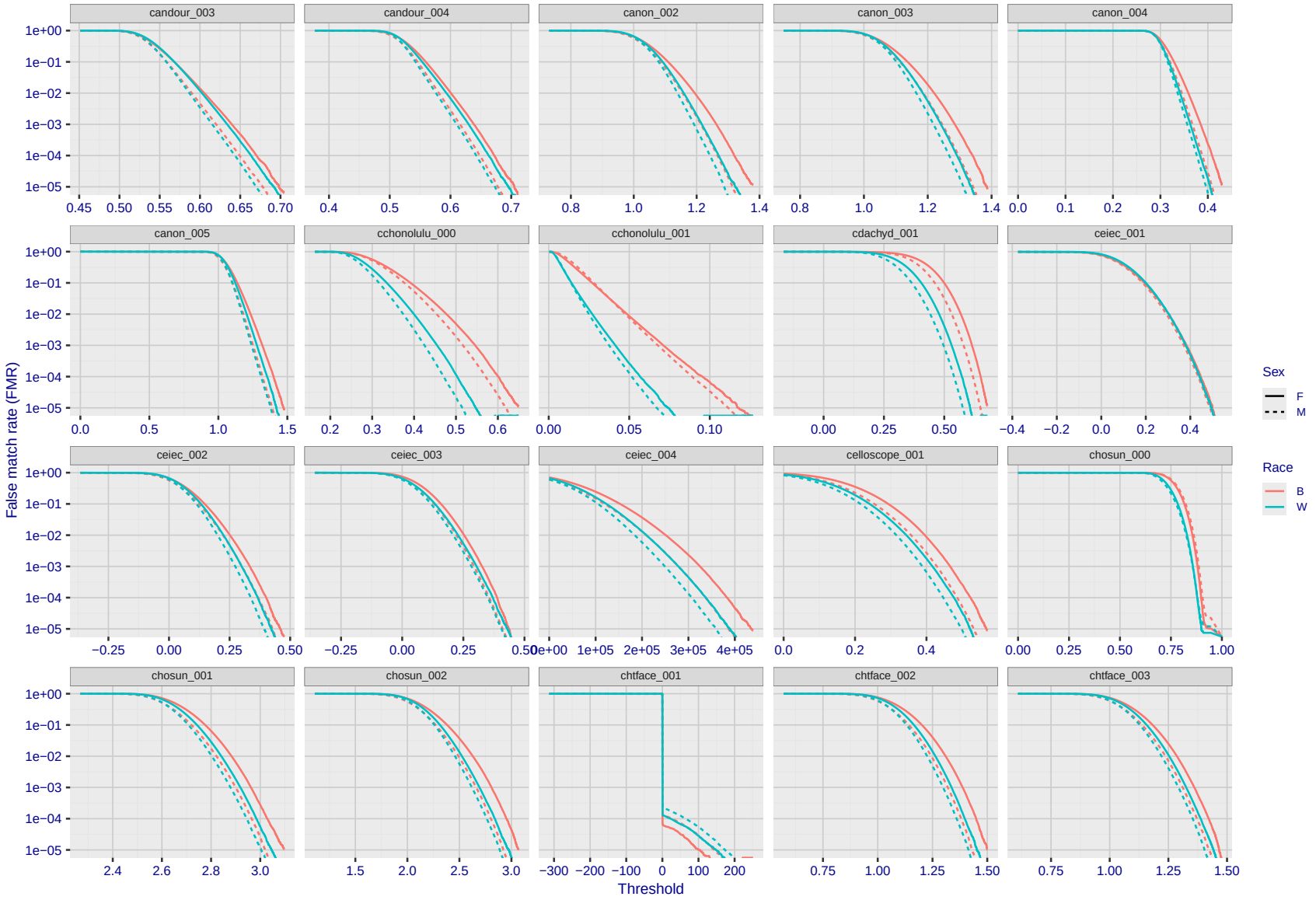

Figure 540: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

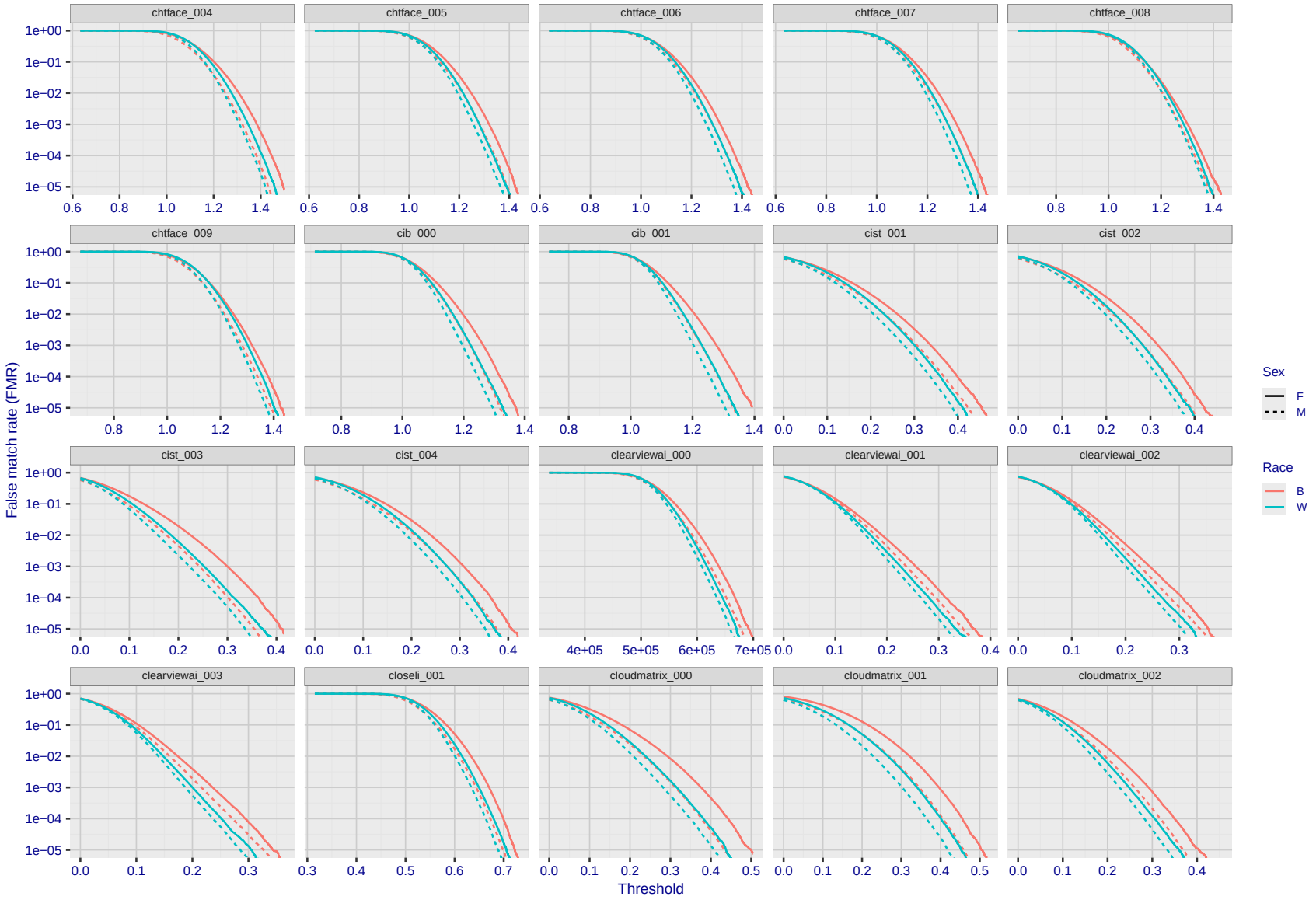

Figure 541: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

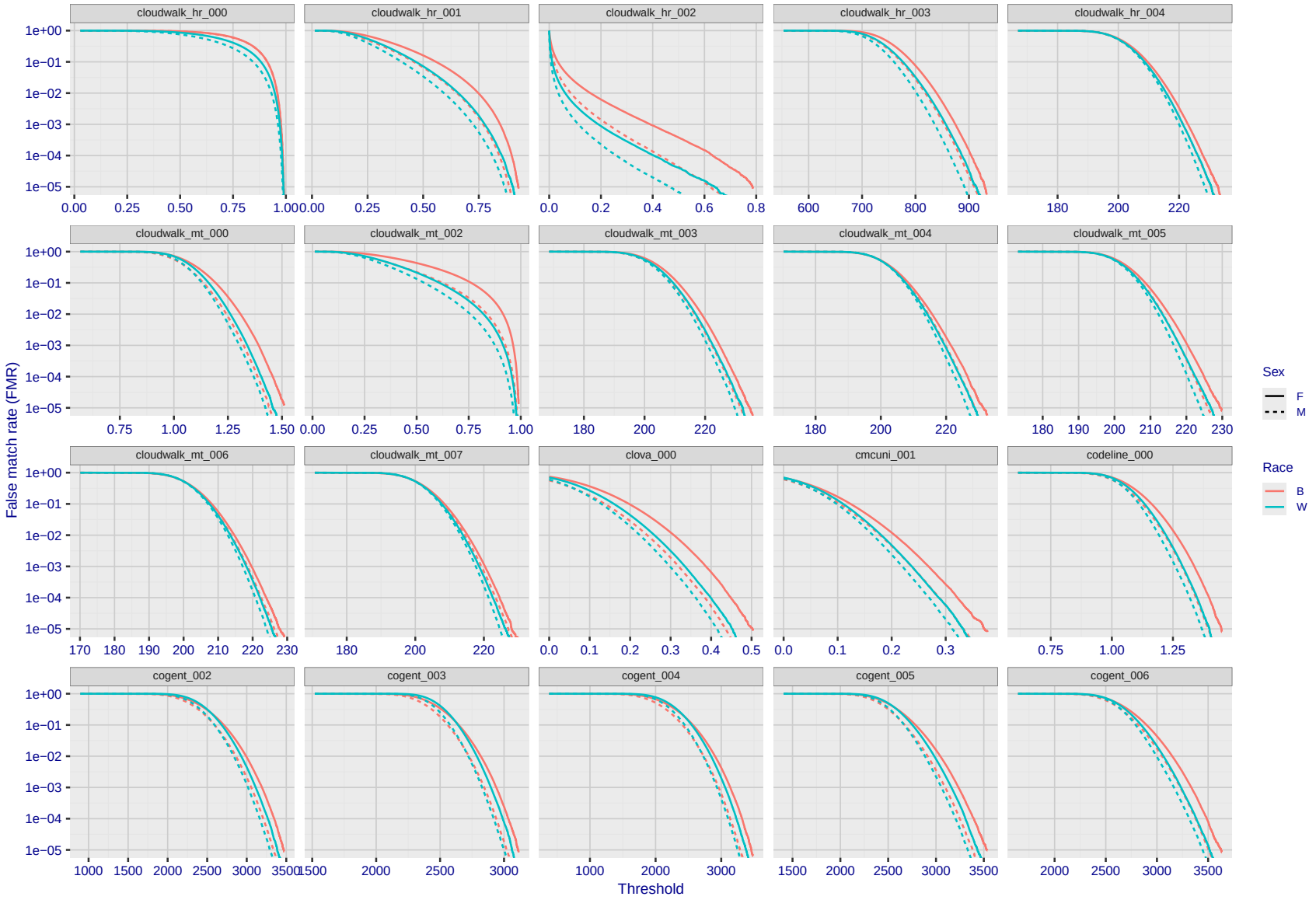

Figure 542: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

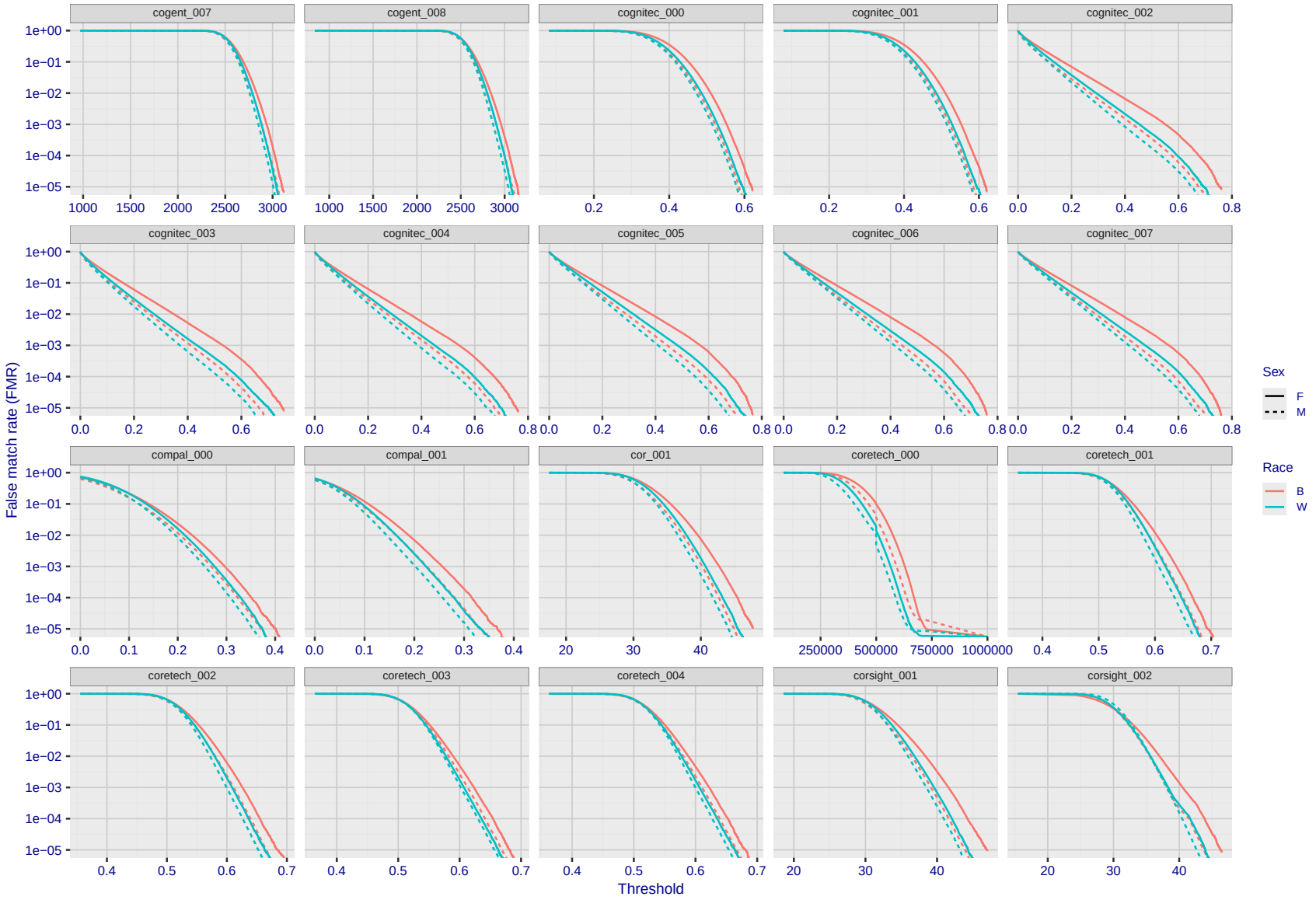

Figure 543: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

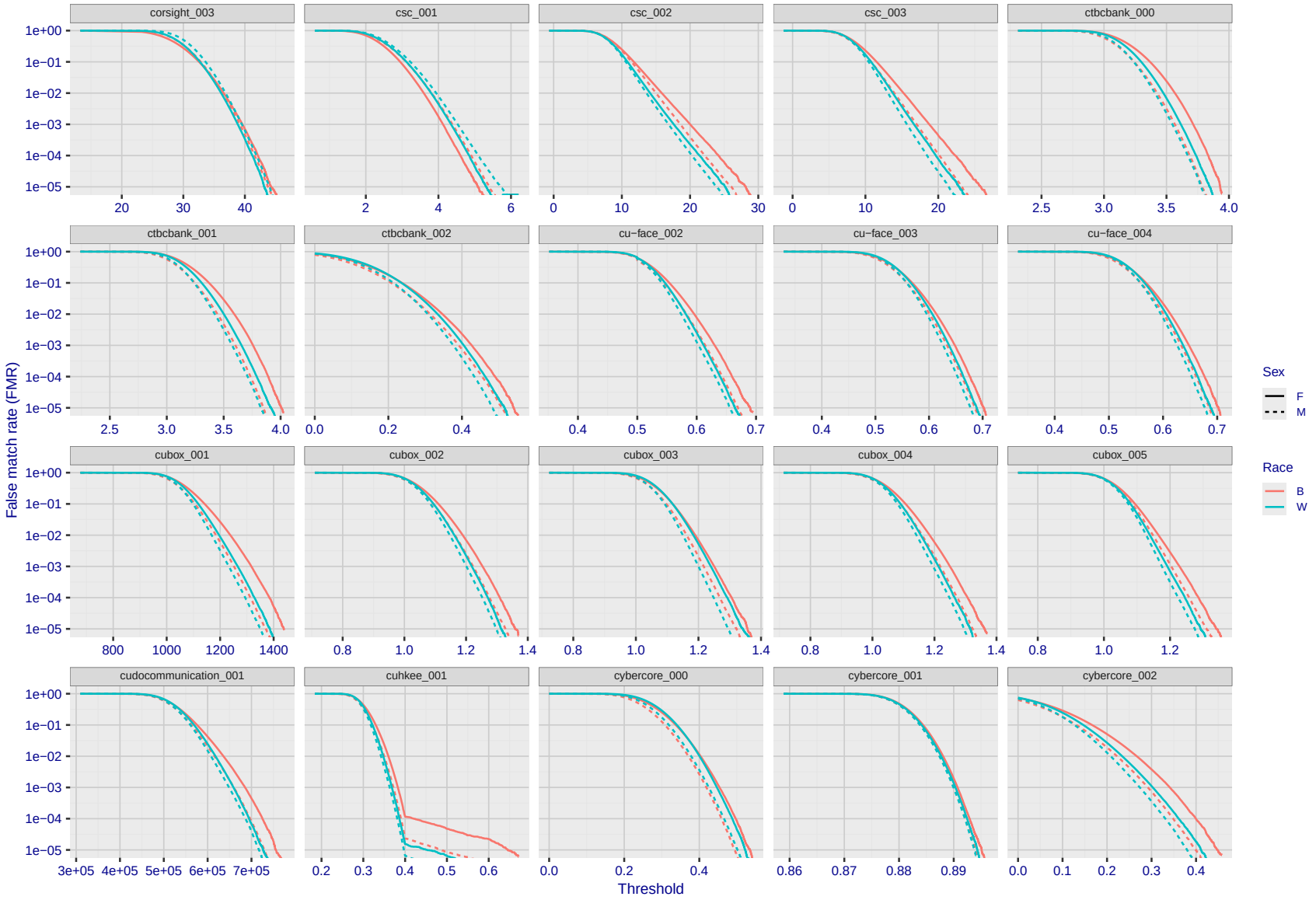

Figure 544: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

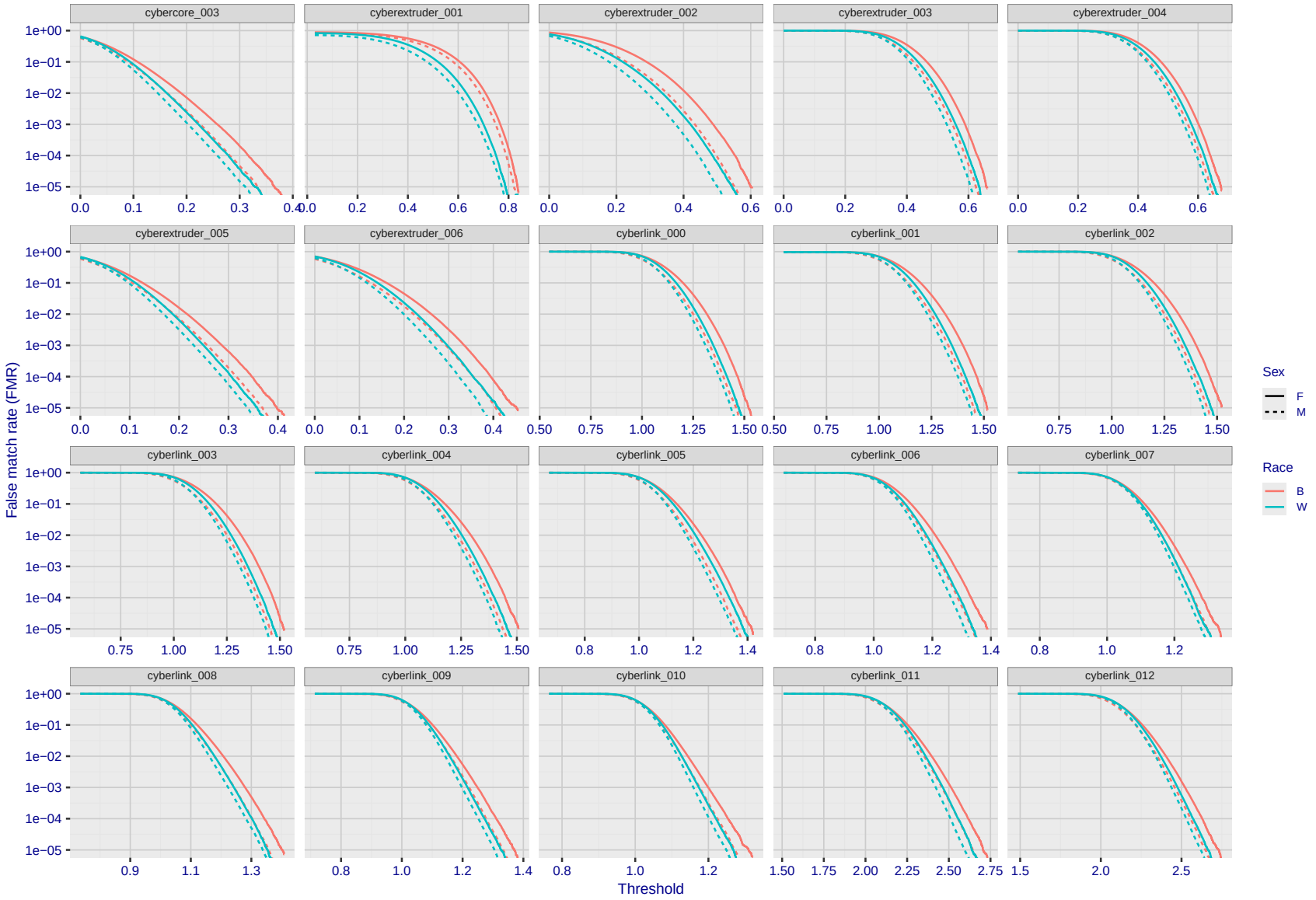

Figure 545: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

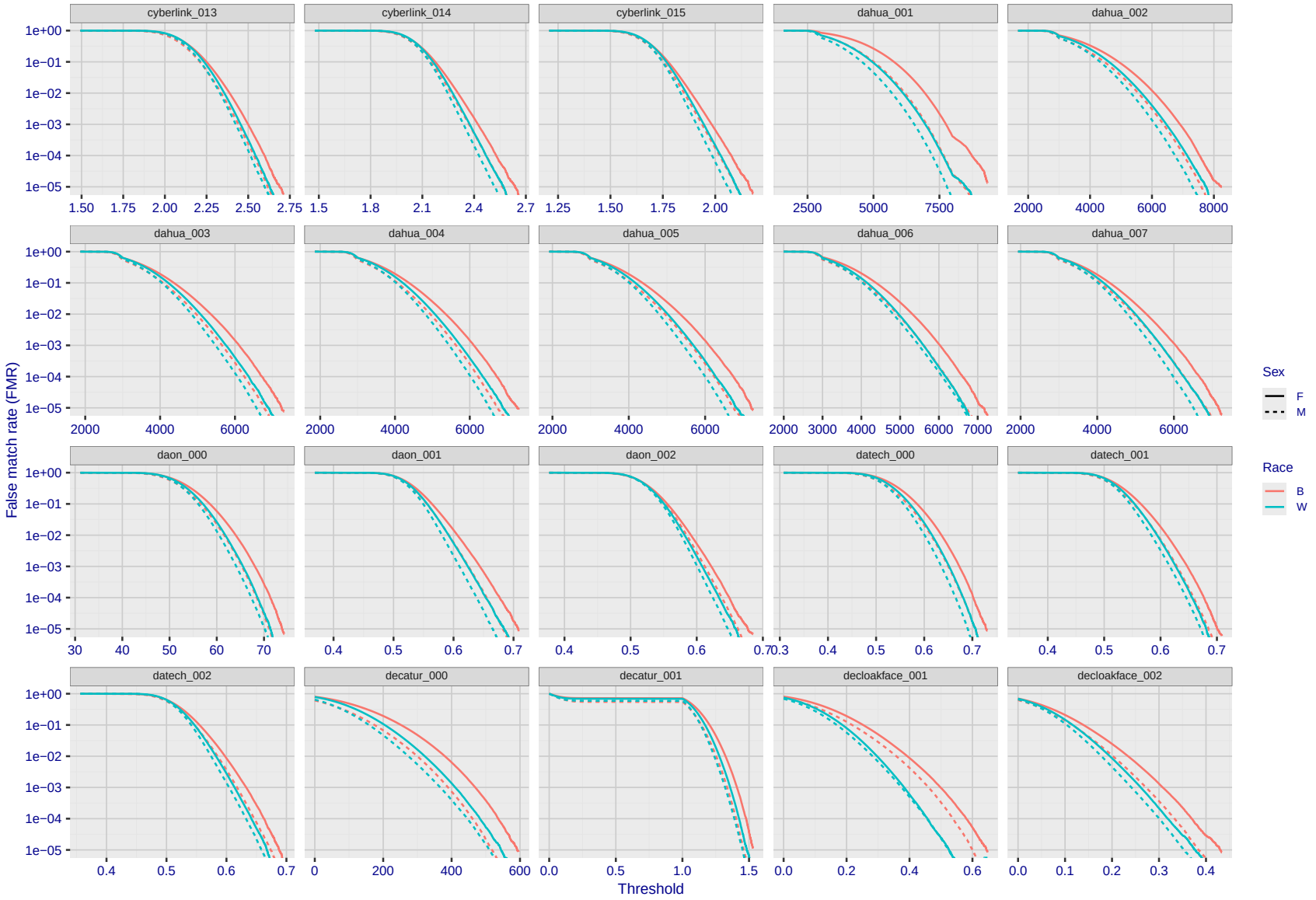

Figure 546: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

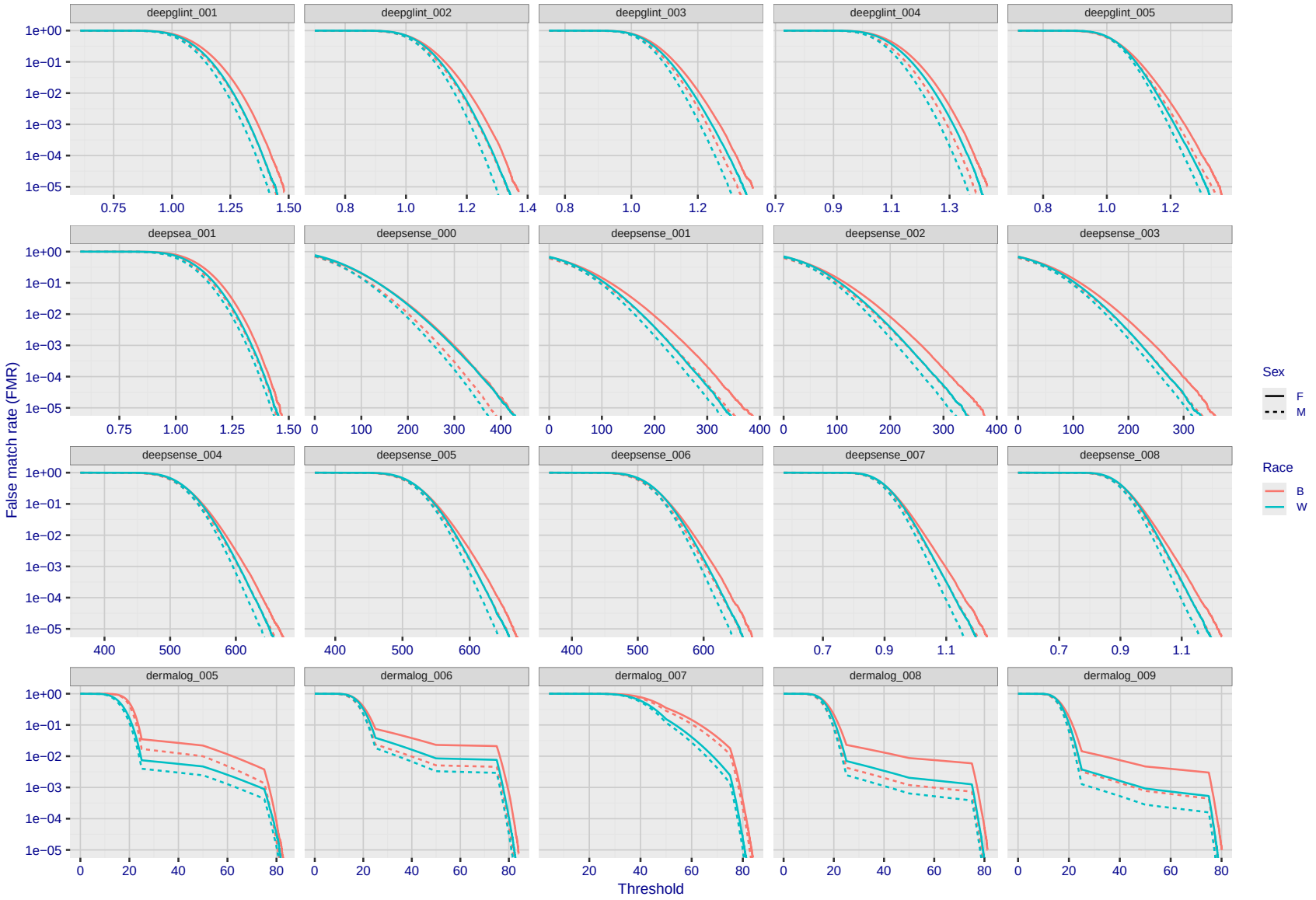

Figure 547: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

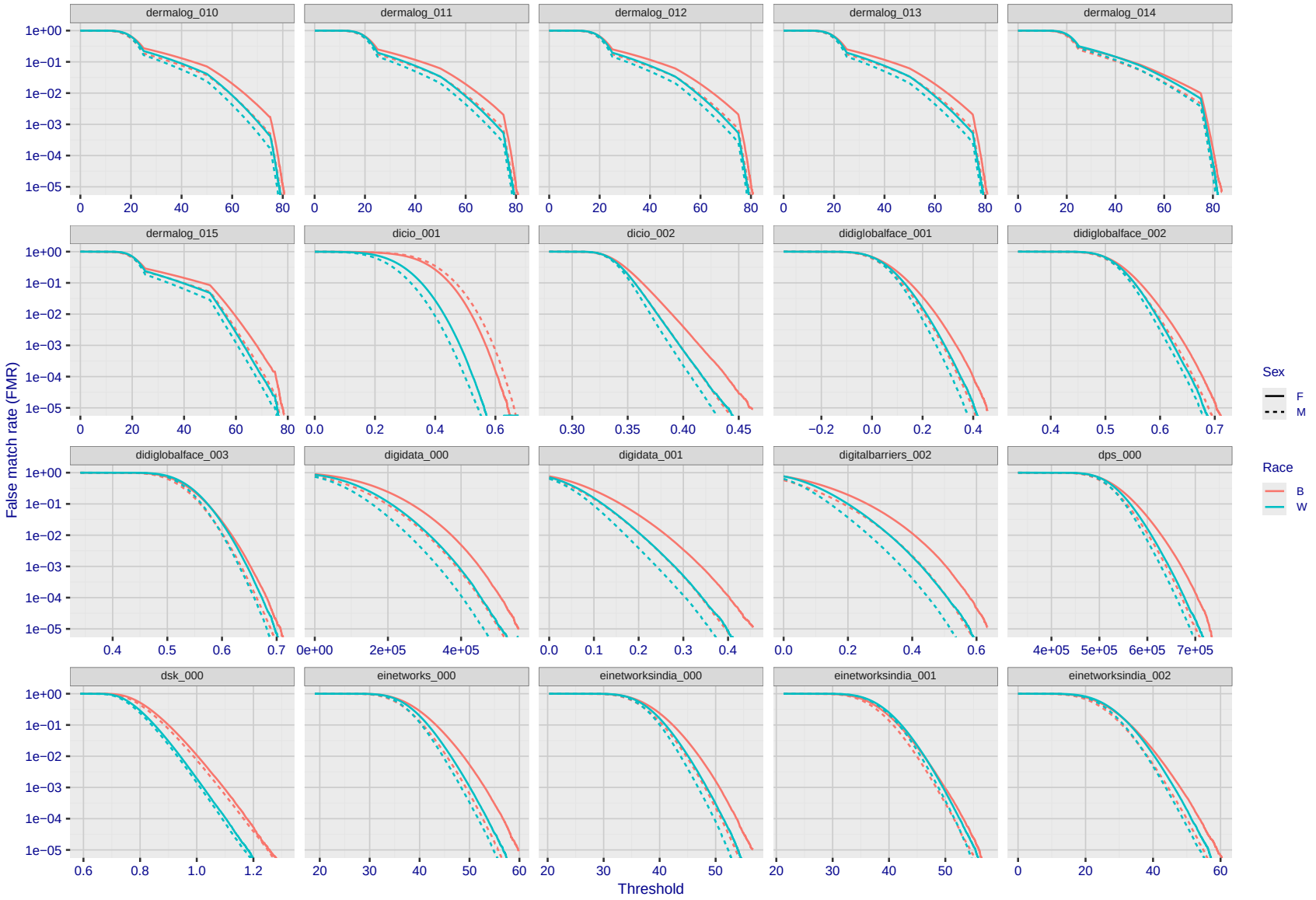

Figure 548: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

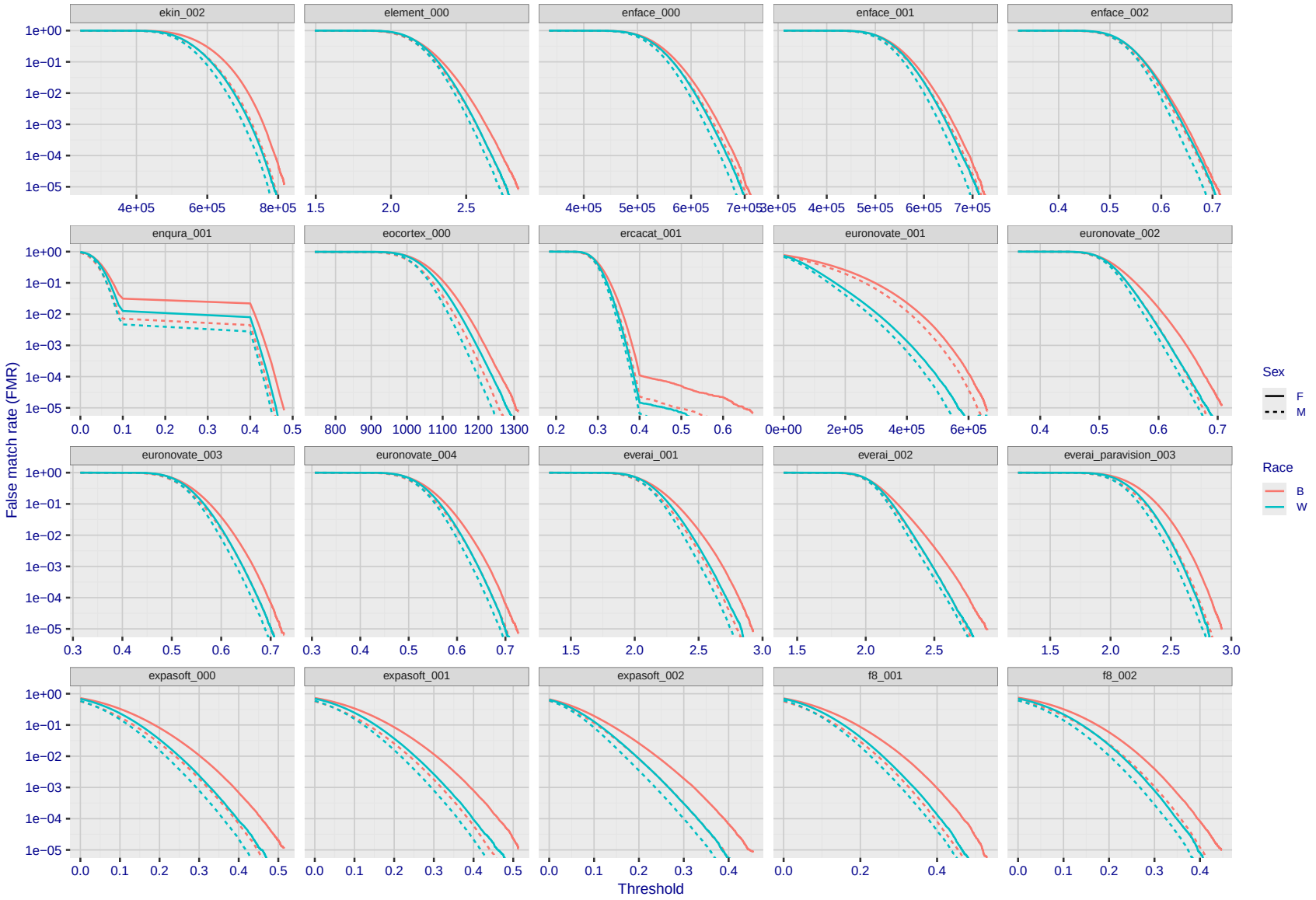

Figure 549: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

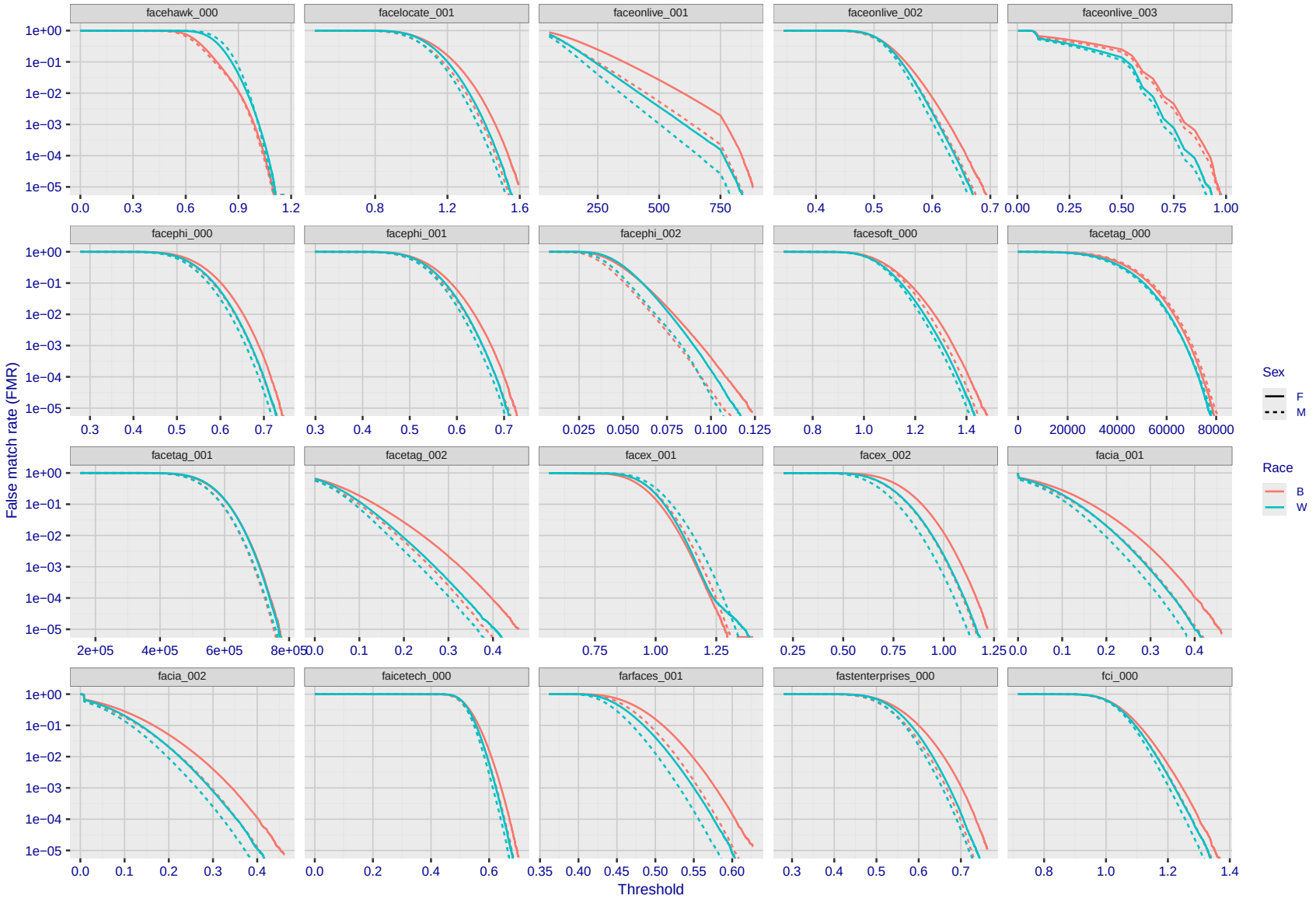

Figure 550: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

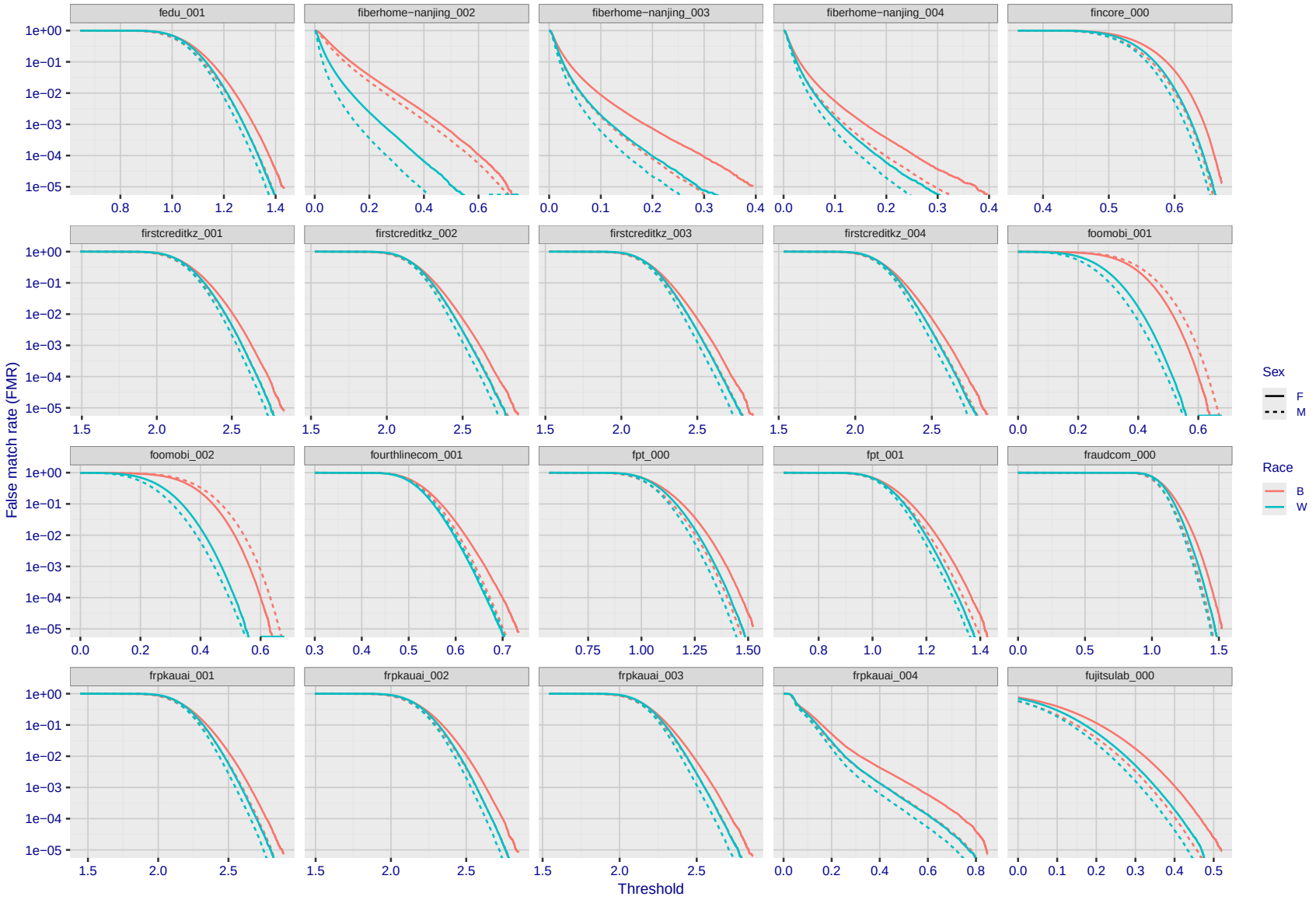

Figure 551: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

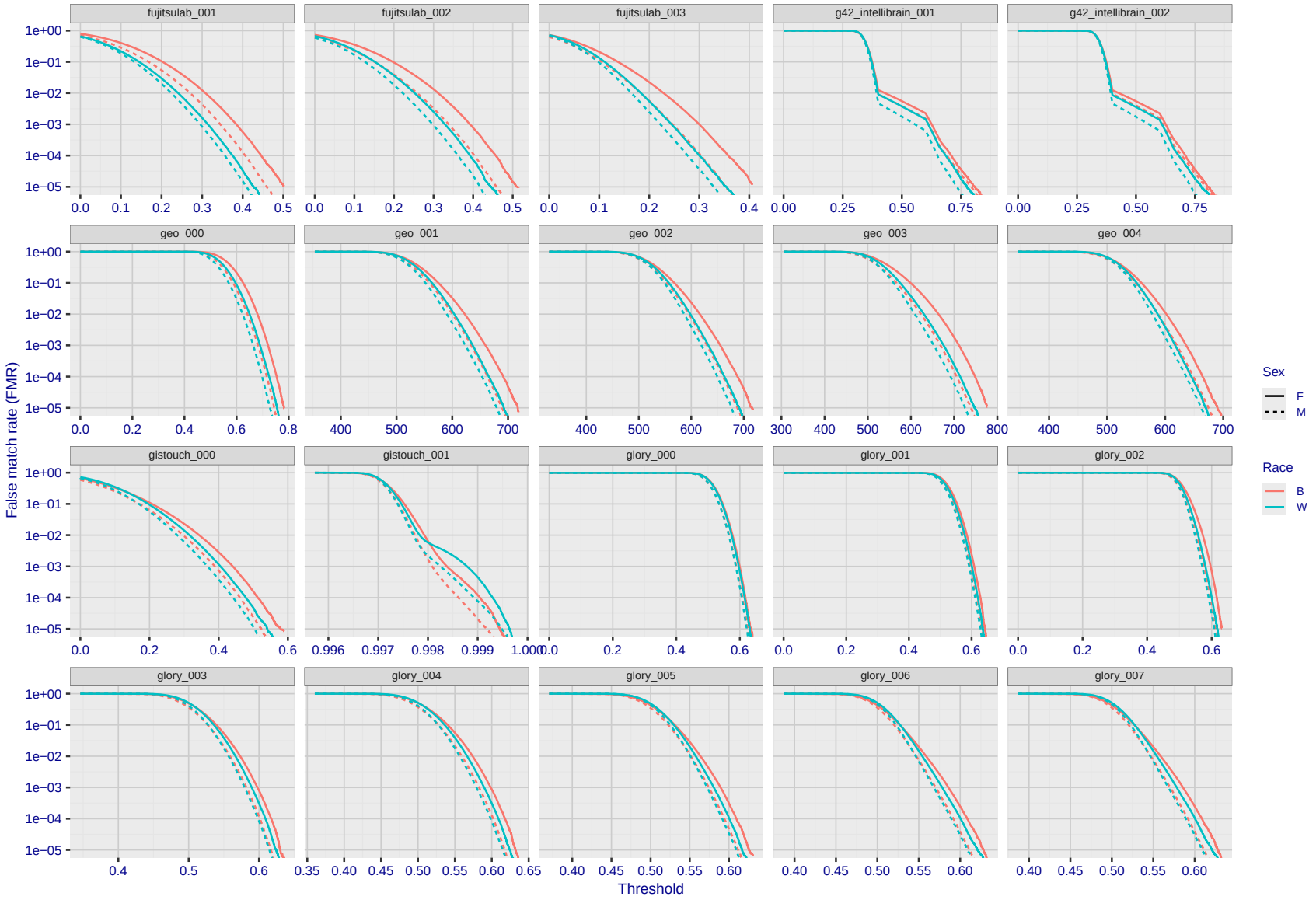

Figure 552: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

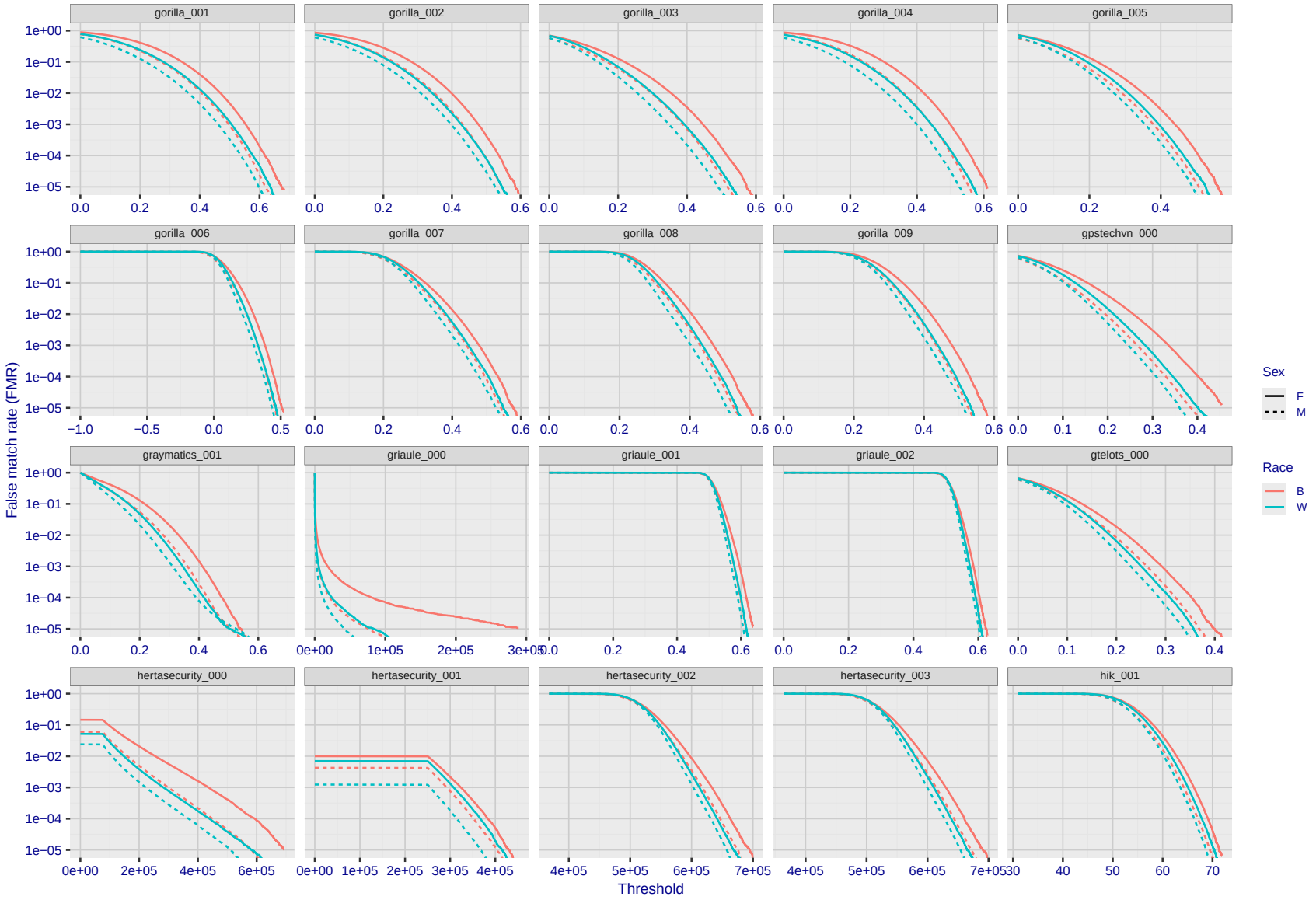

Figure 553: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

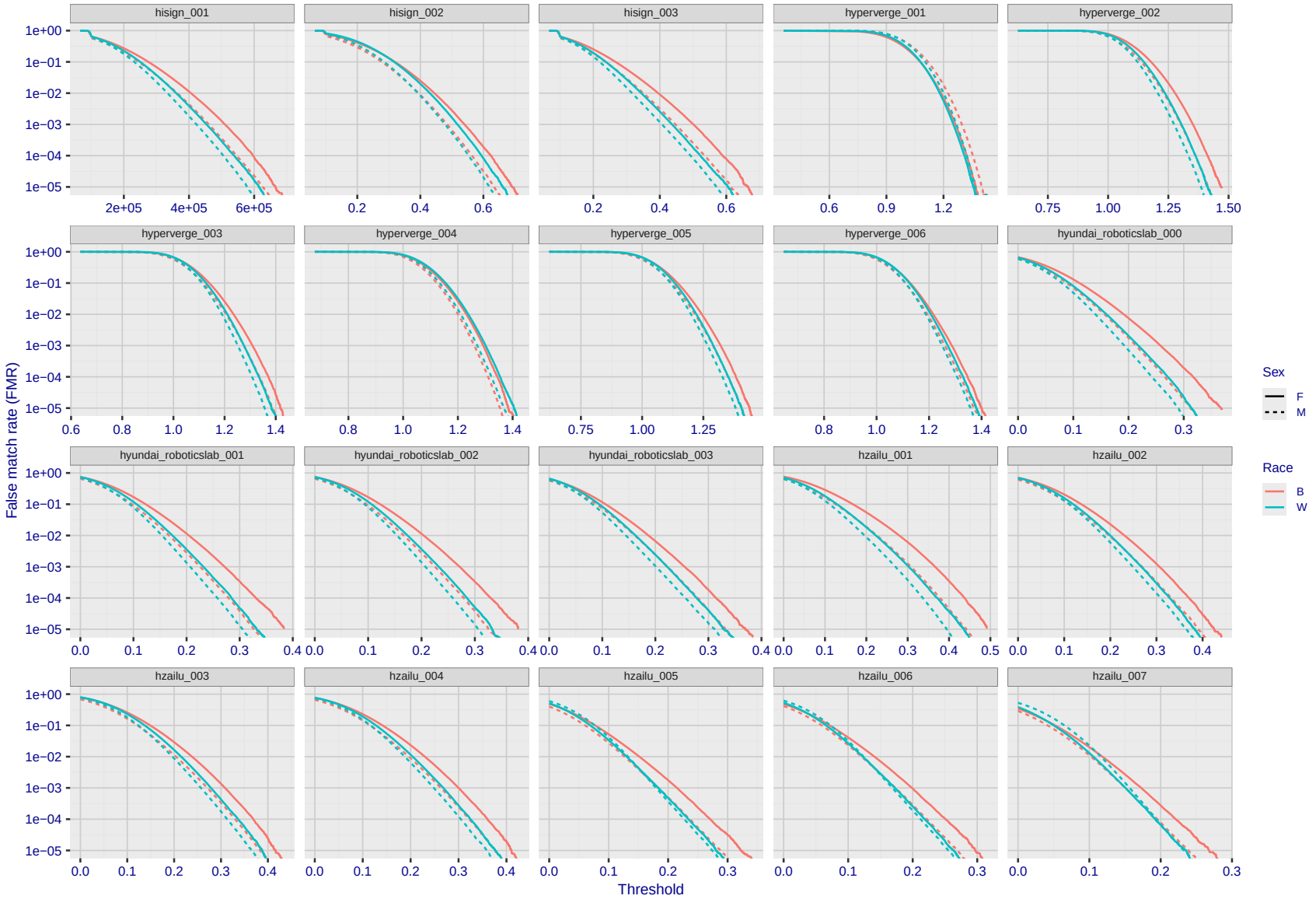

Figure 554: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

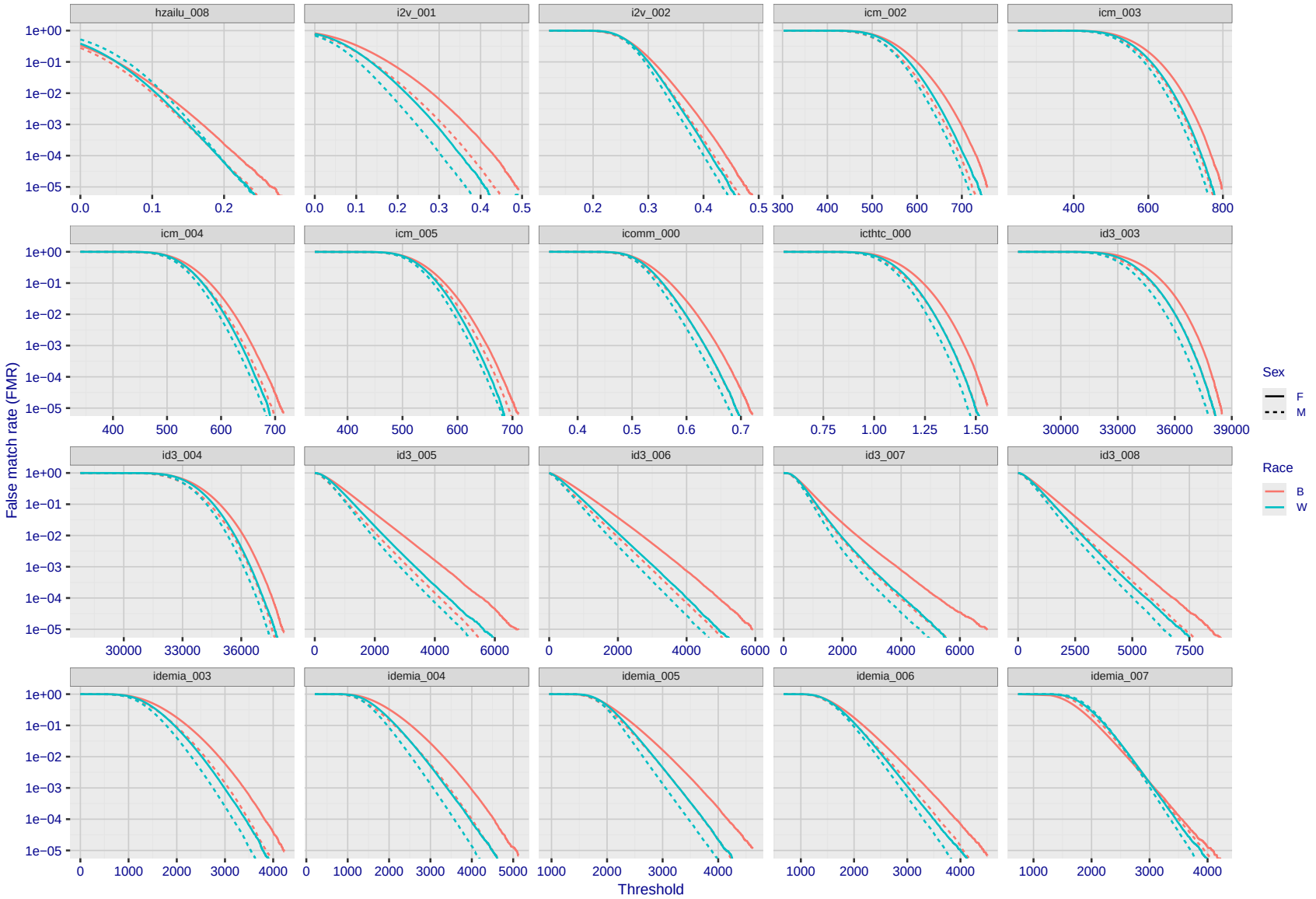

Figure 555: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

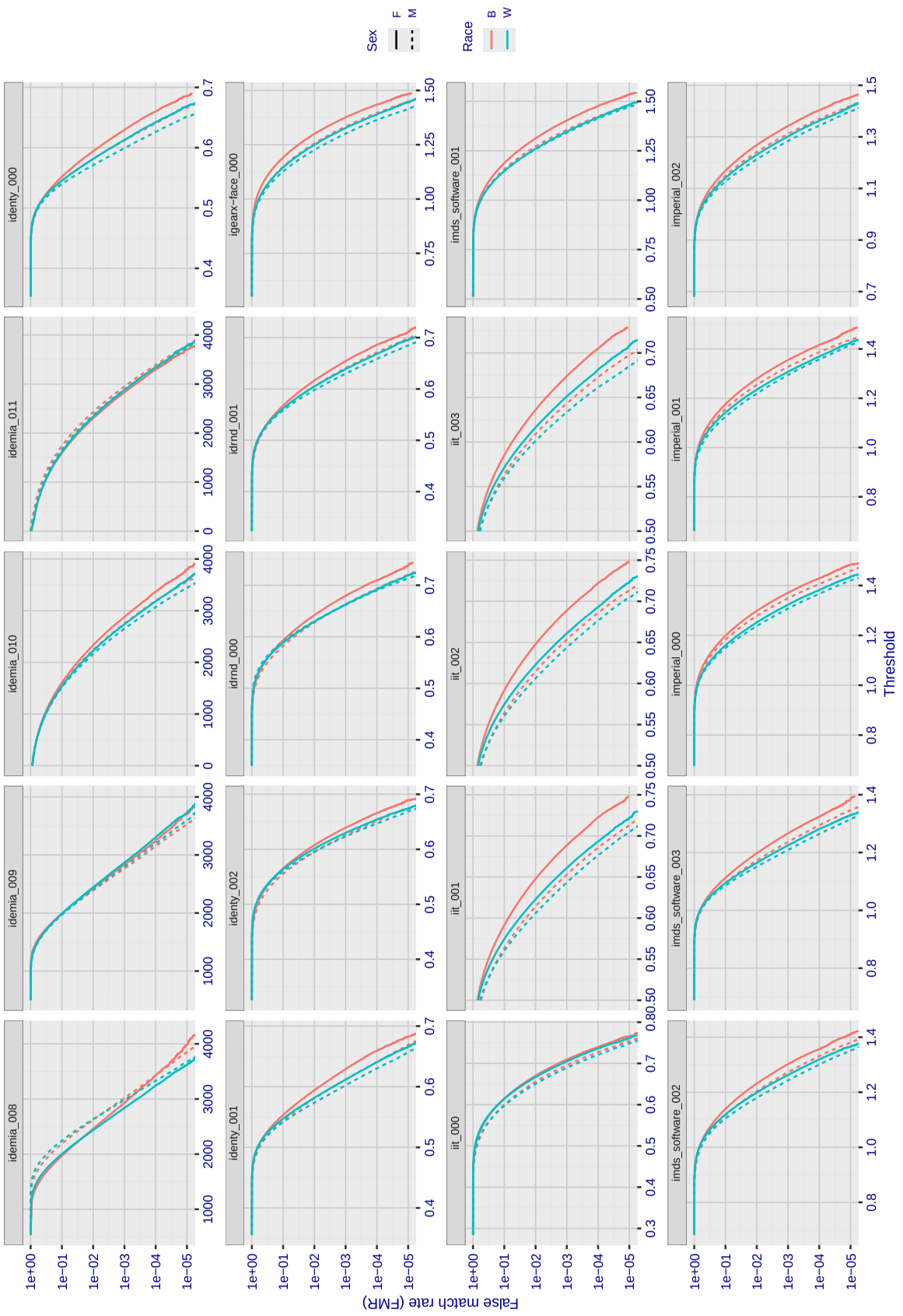

Figure 556: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

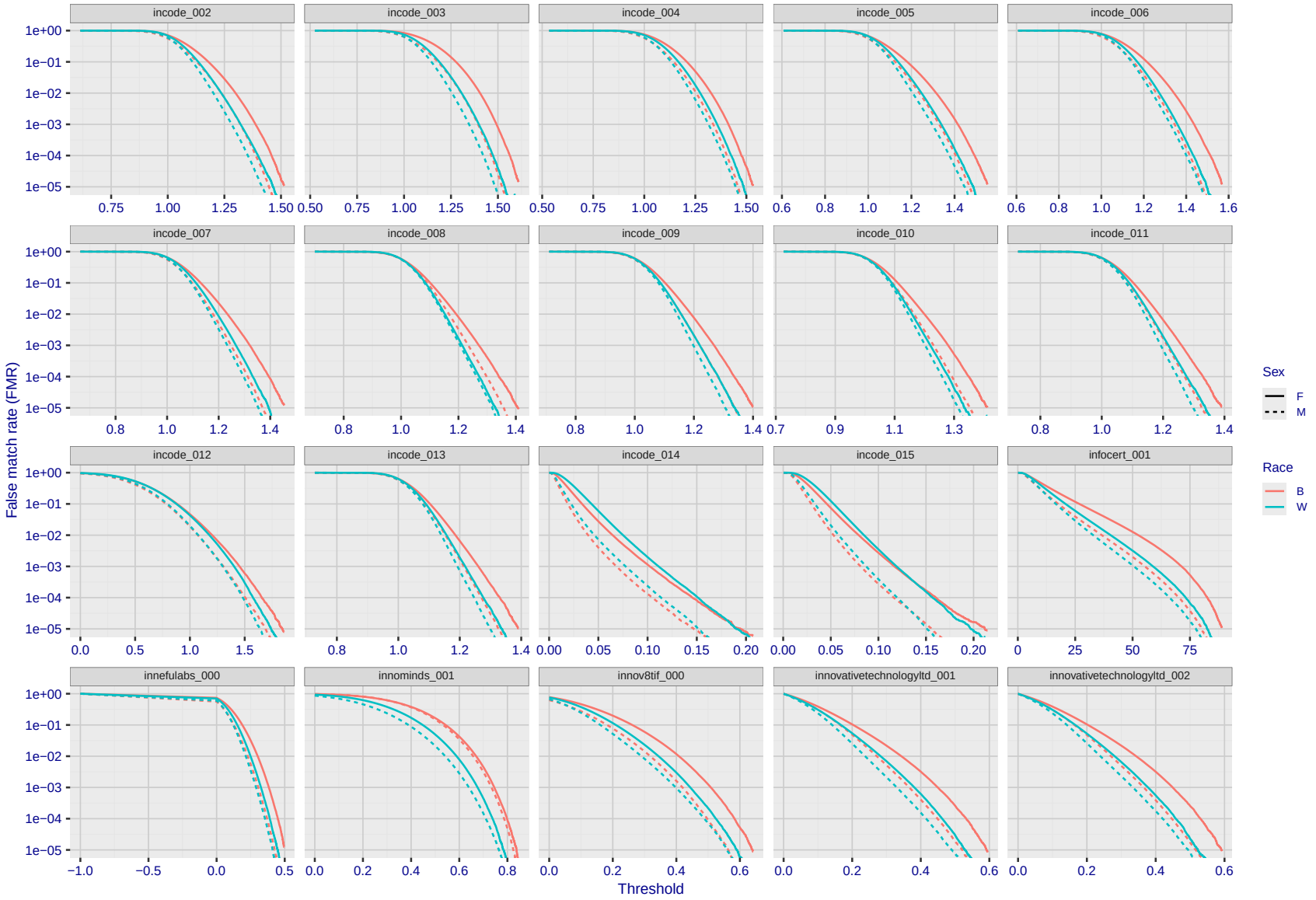

Figure 557: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

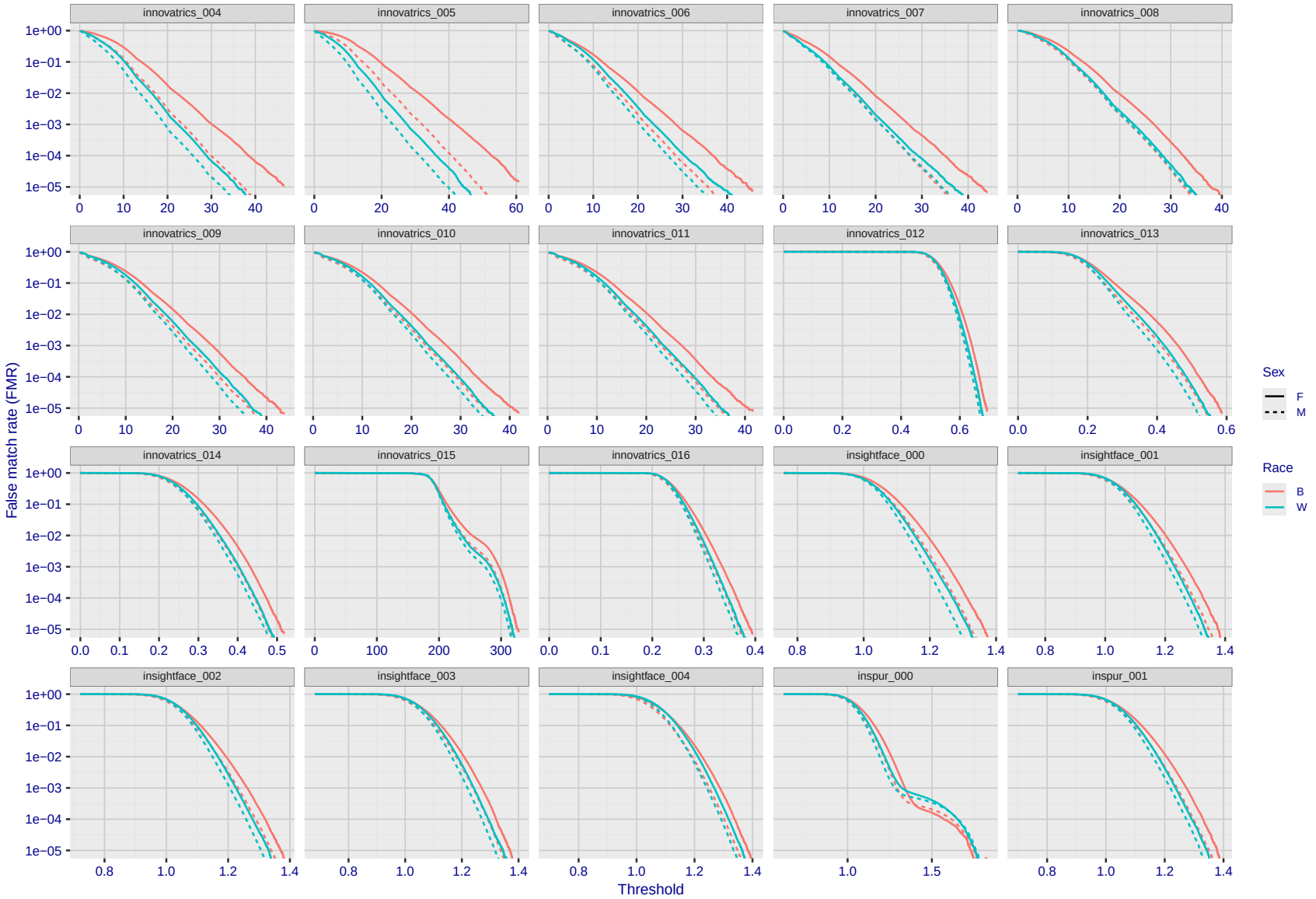

Figure 558: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

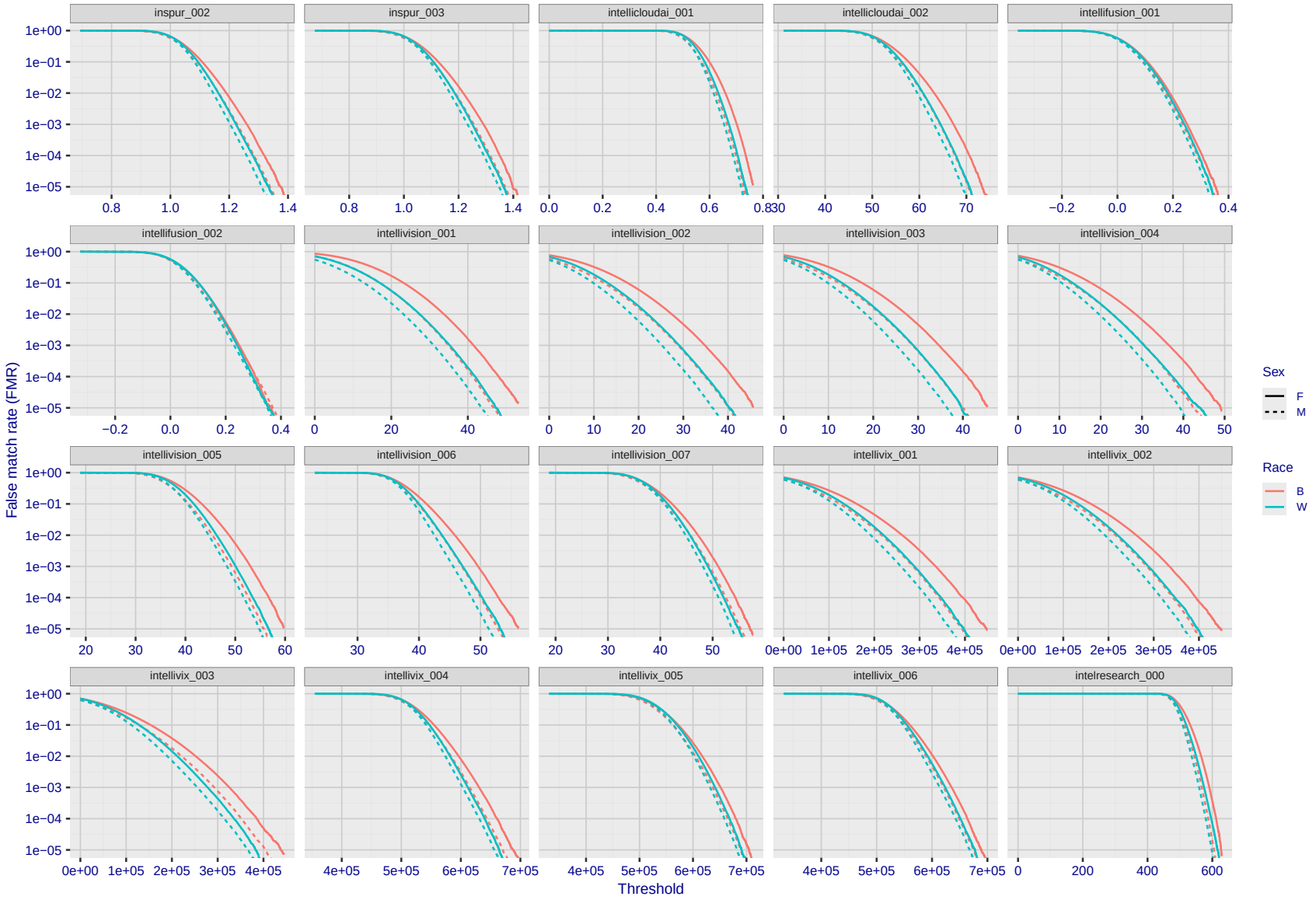

Figure 559: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

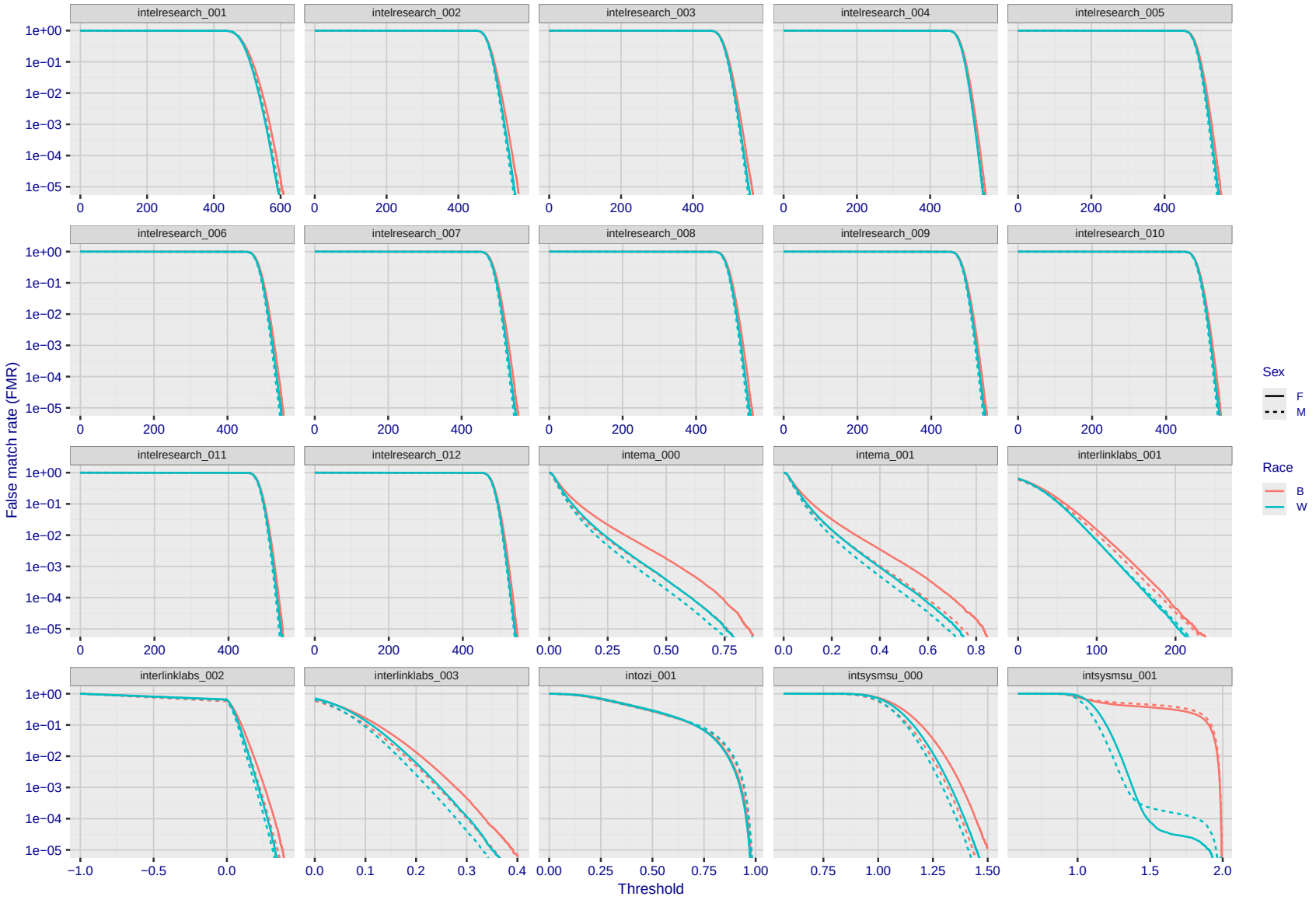

Figure 560: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

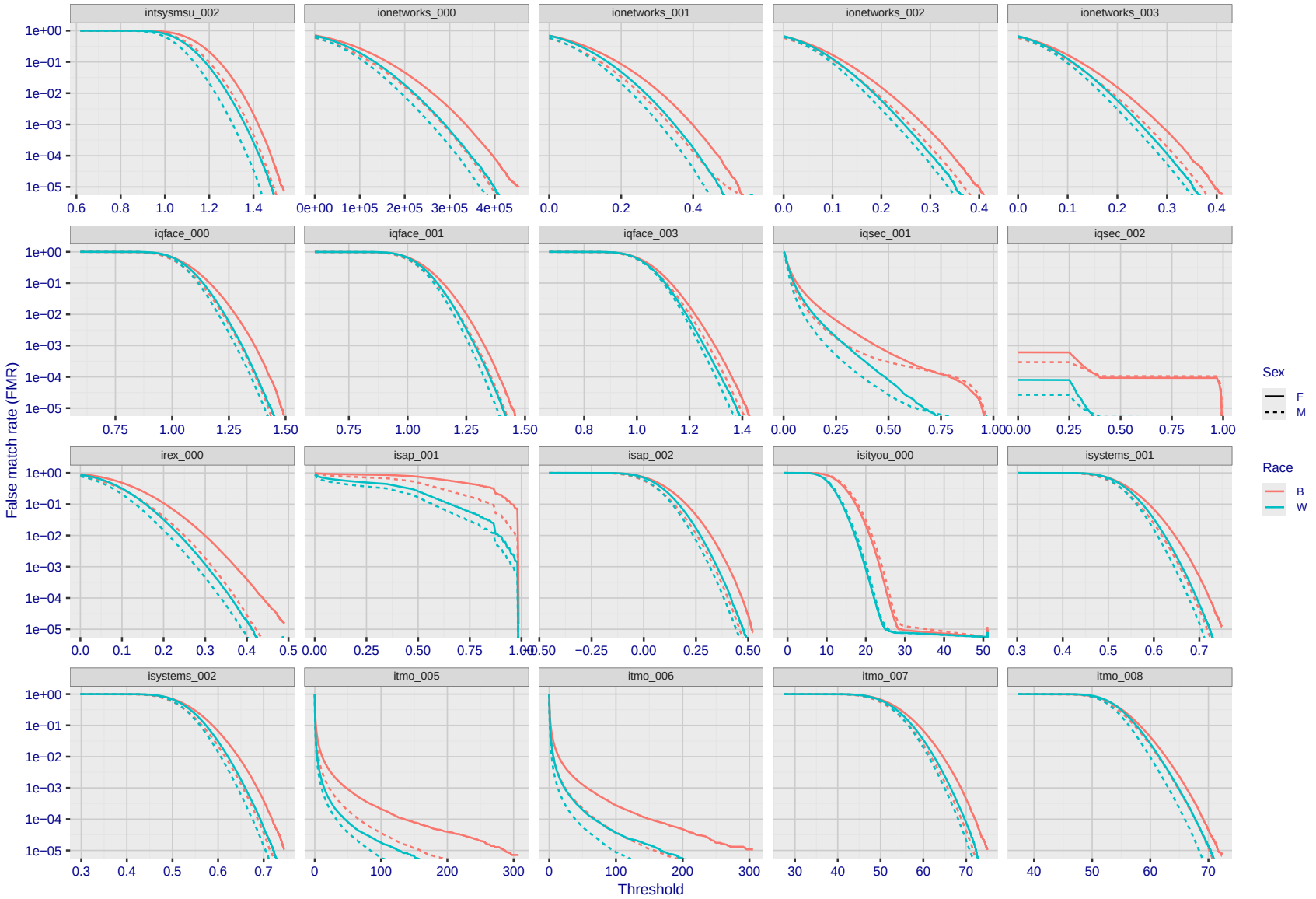

Figure 561: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

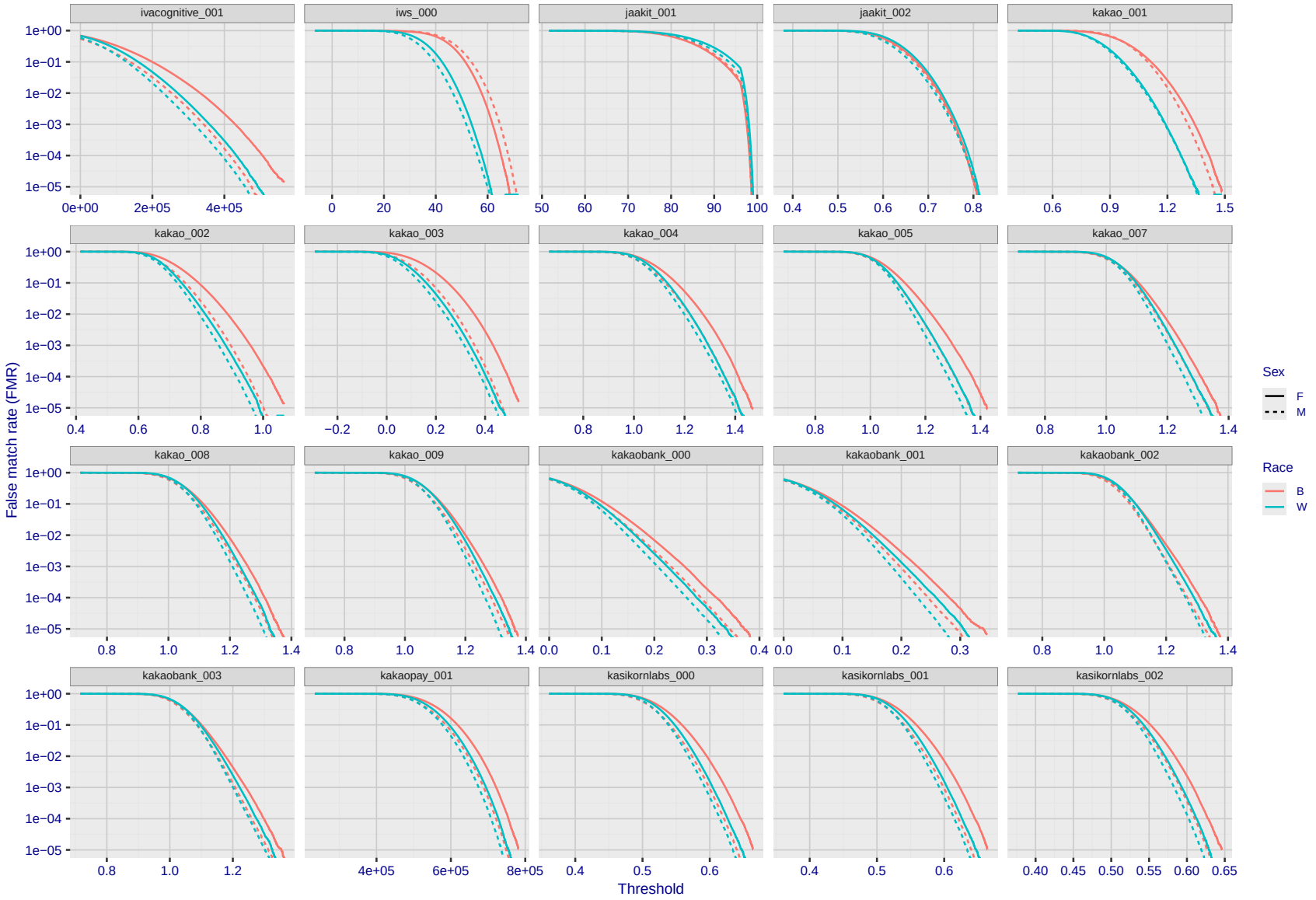

Figure 562: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

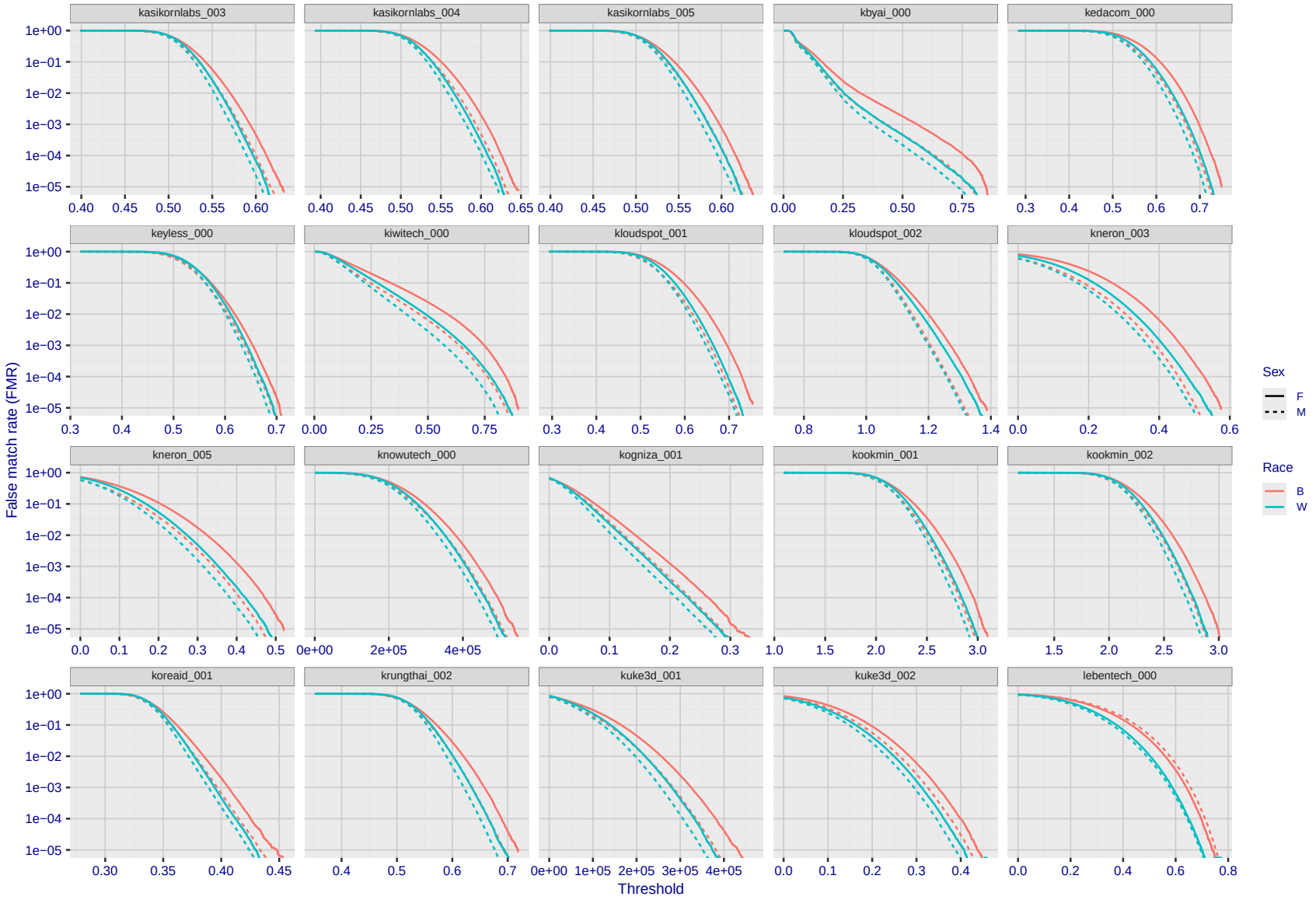

Figure 563: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

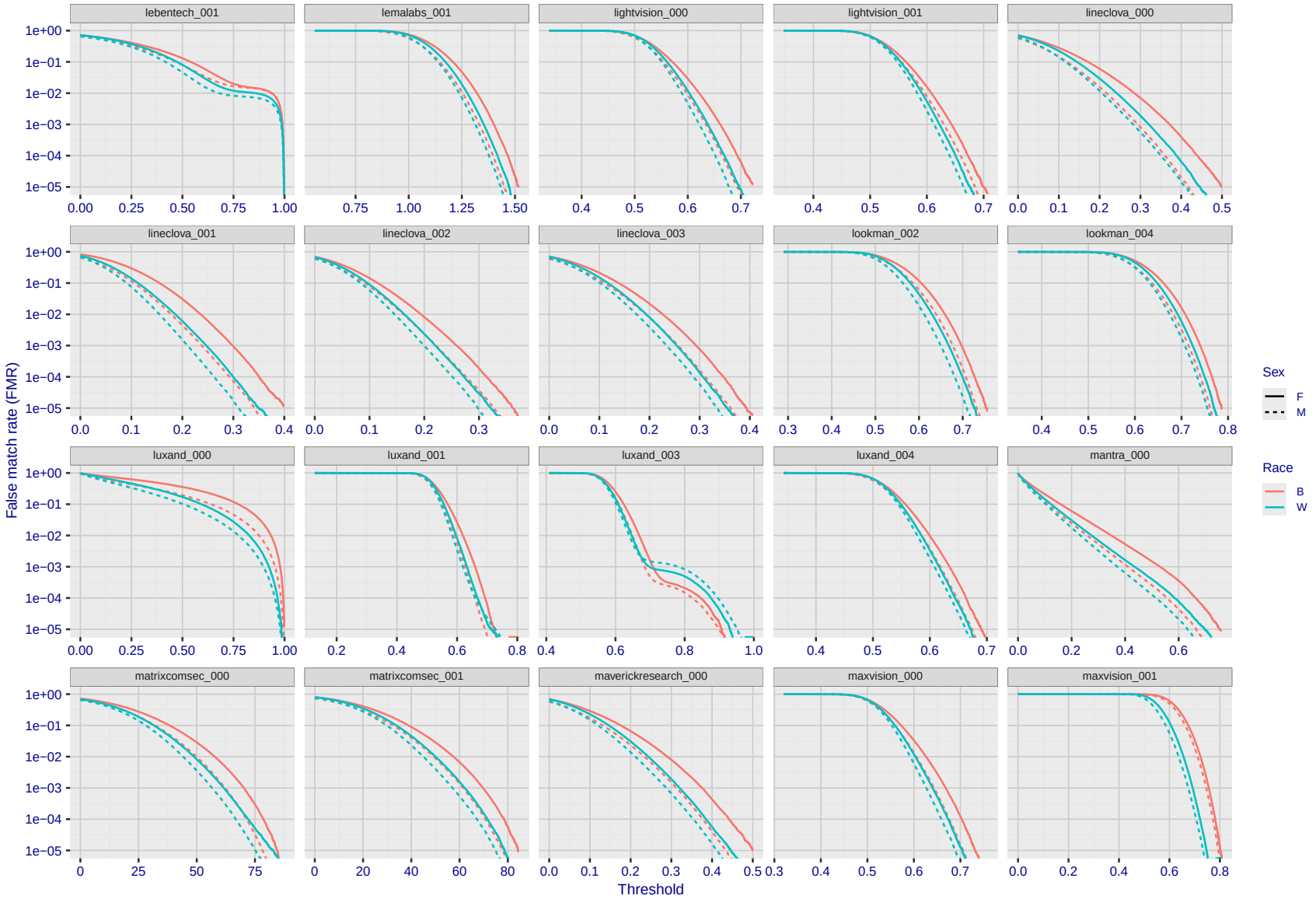

Figure 564: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

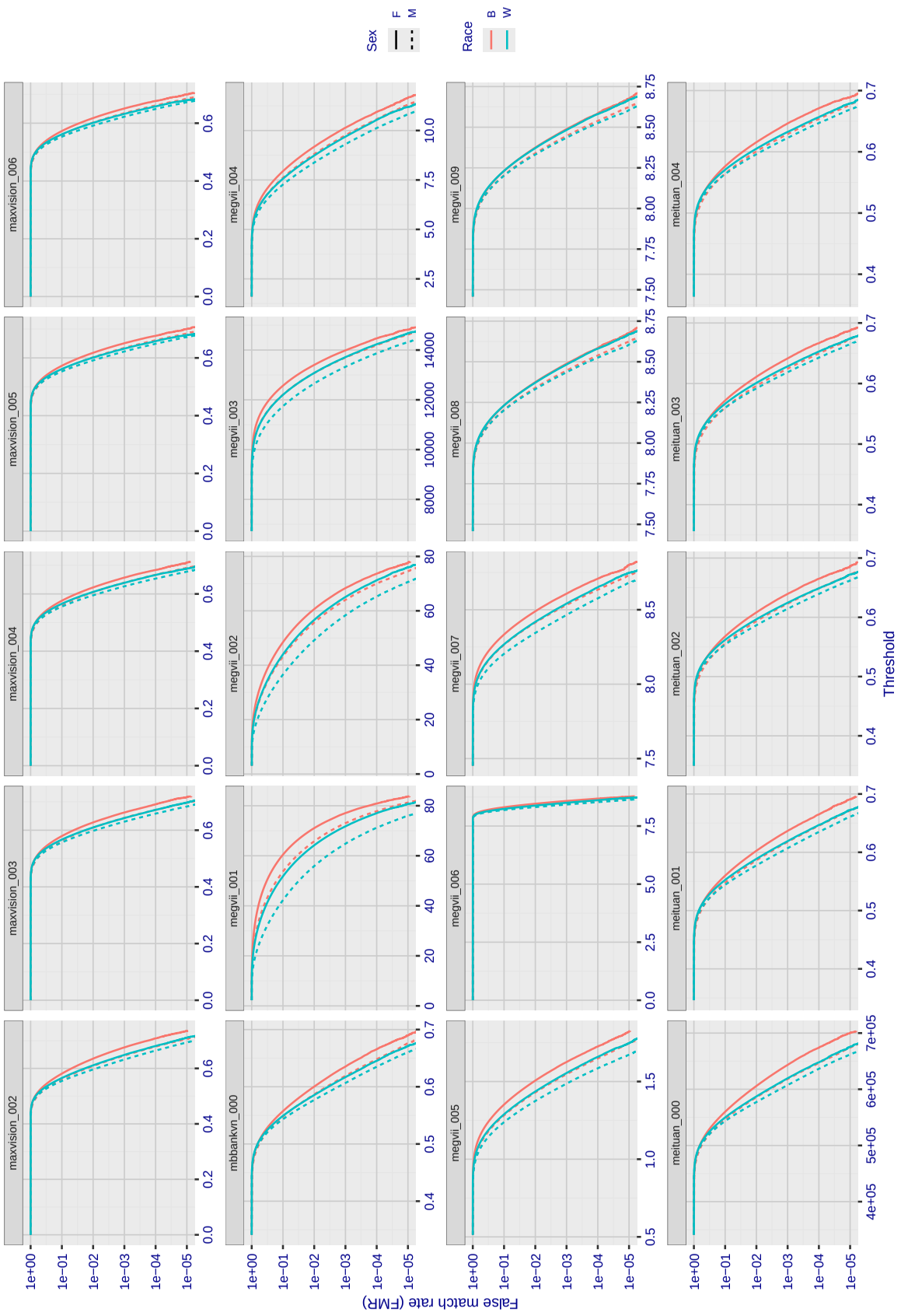

Figure 565: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

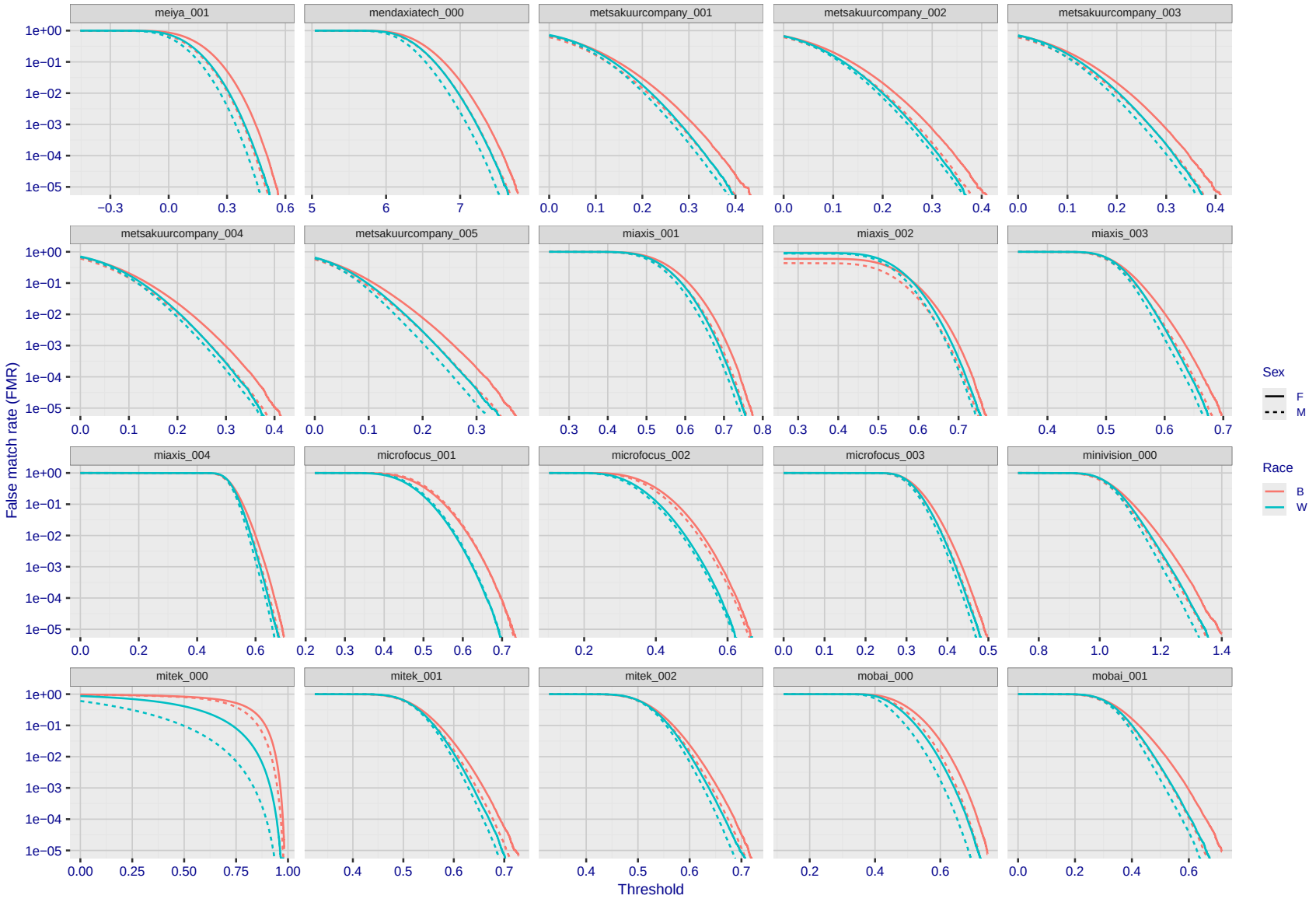

Figure 566: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

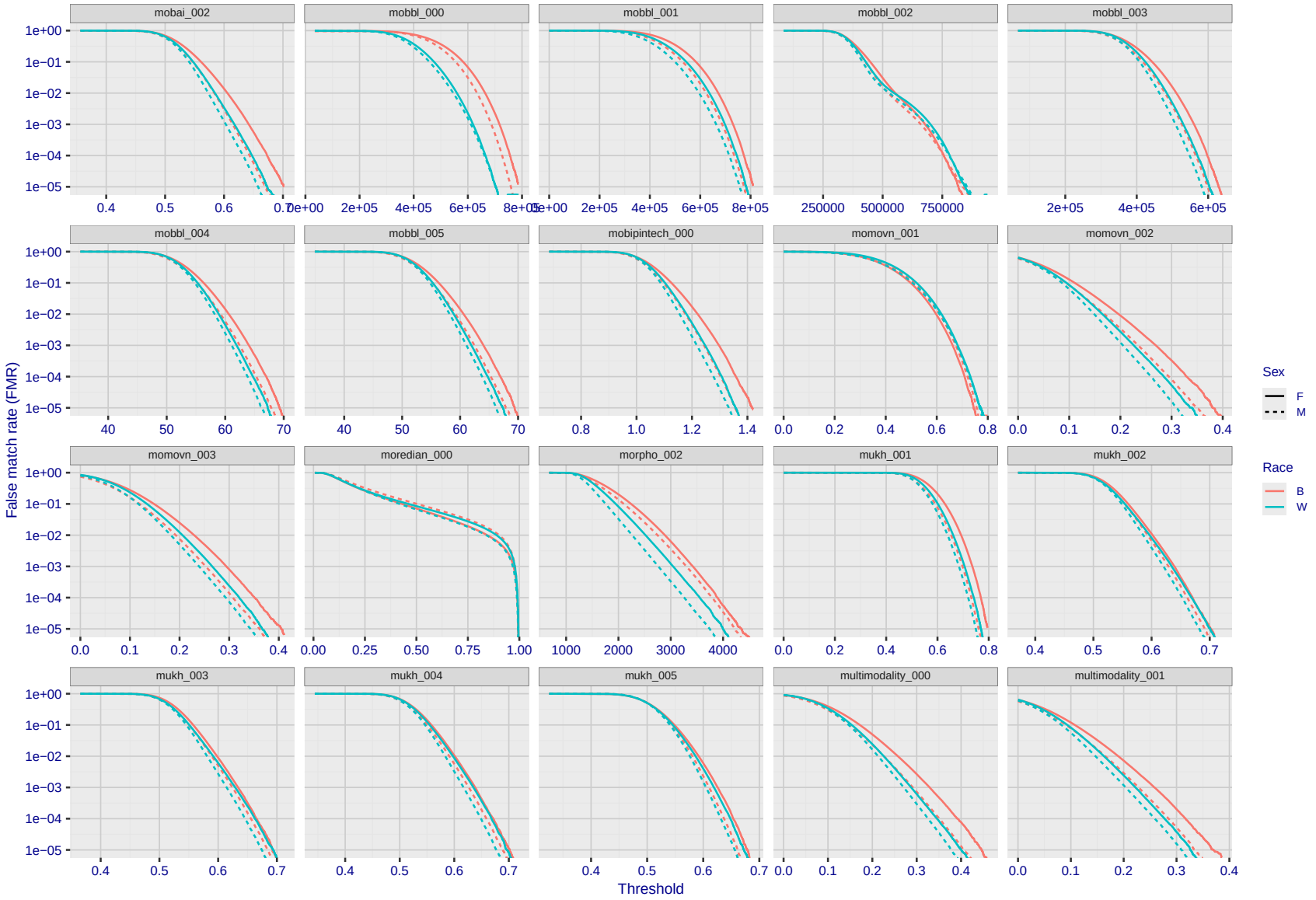

Figure 567: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

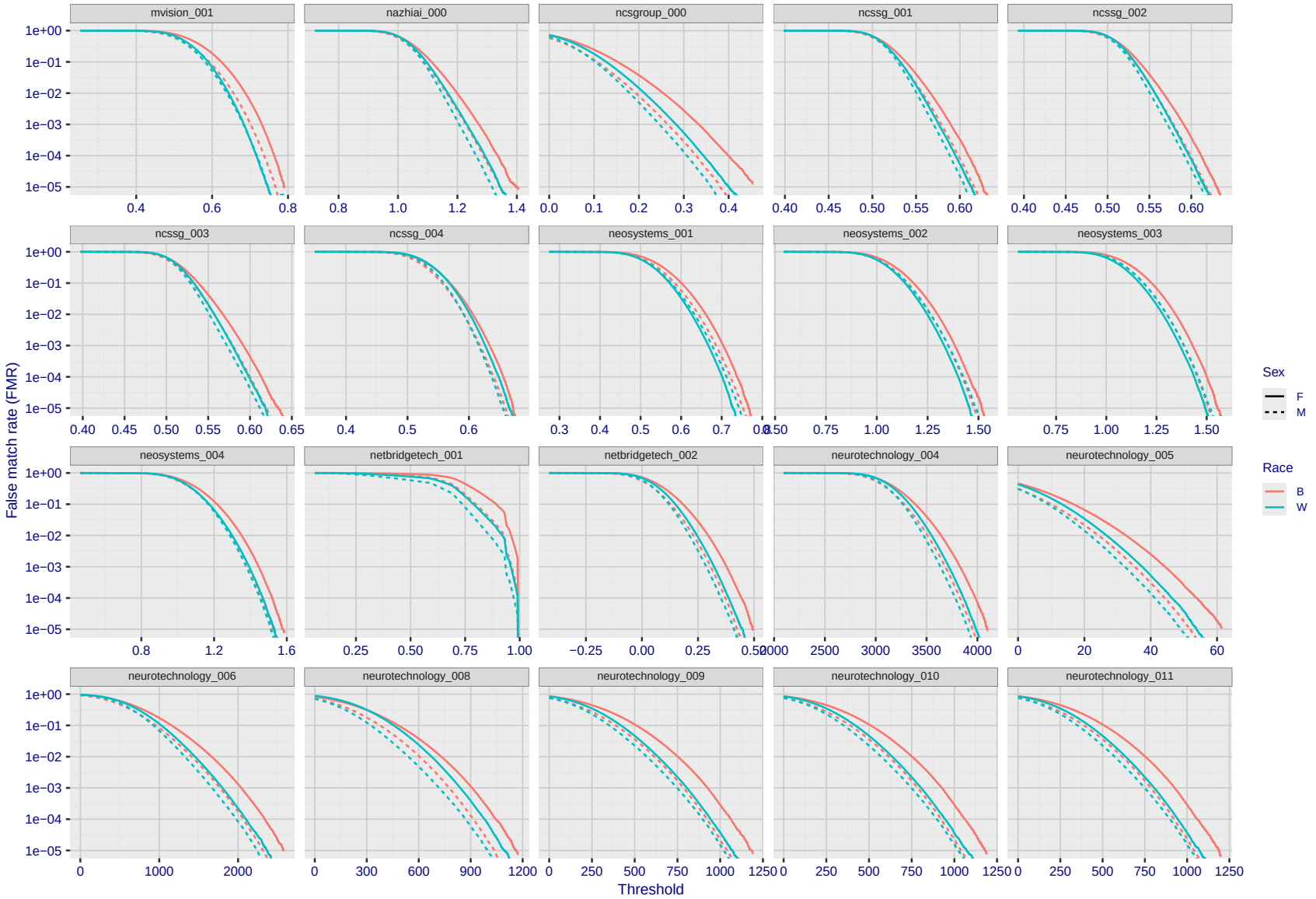

Figure 568: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

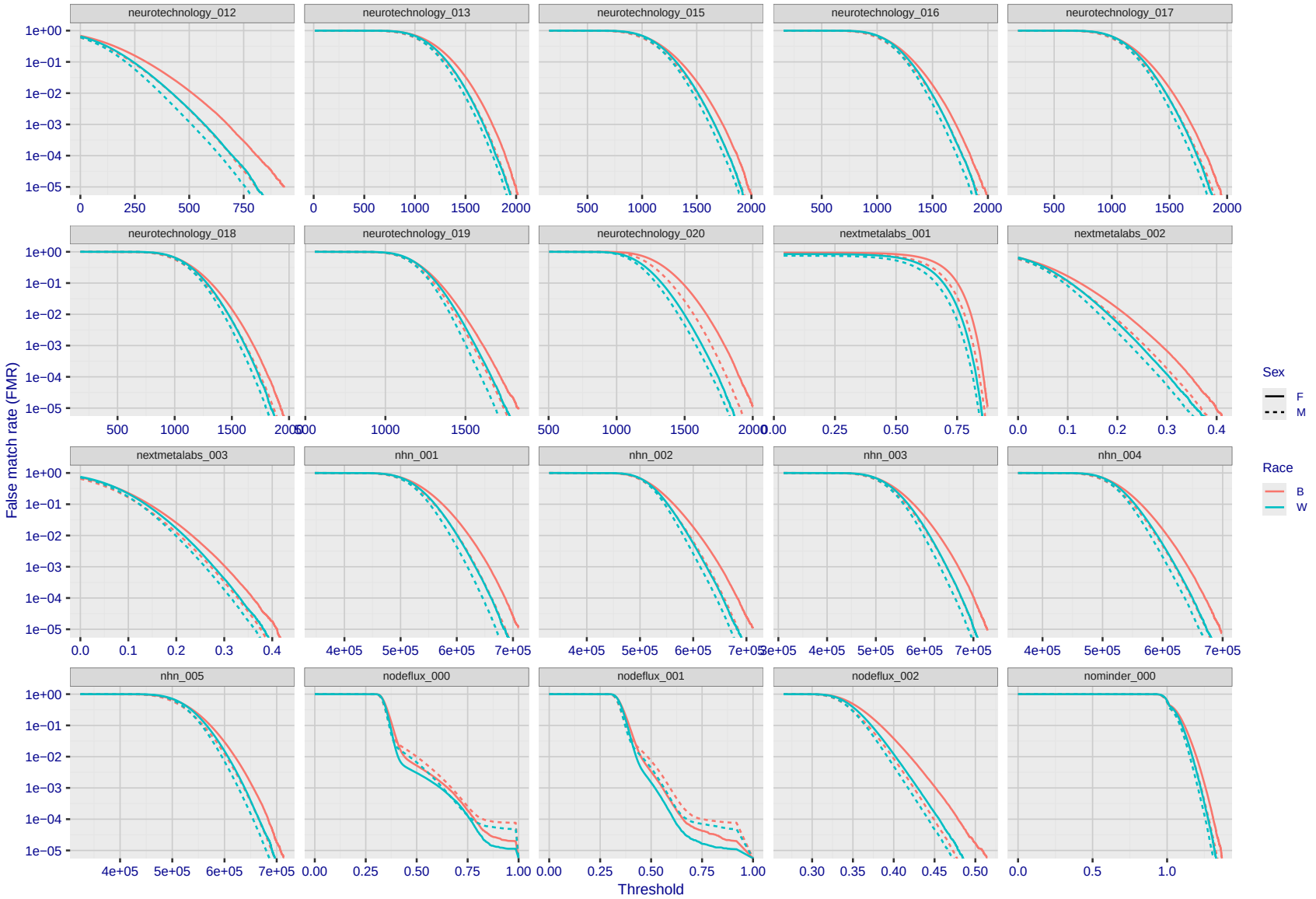

Figure 569: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

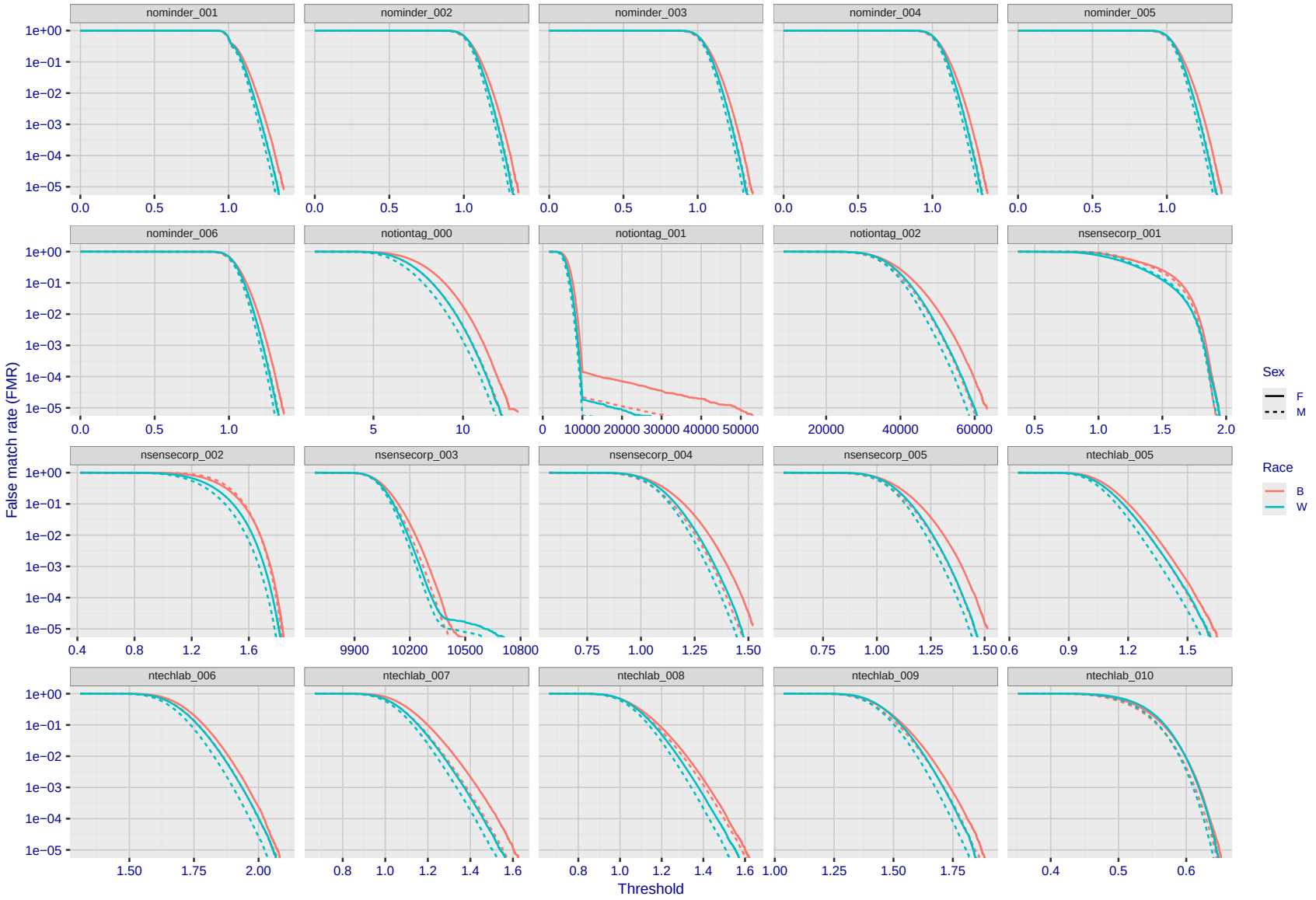

Figure 570: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

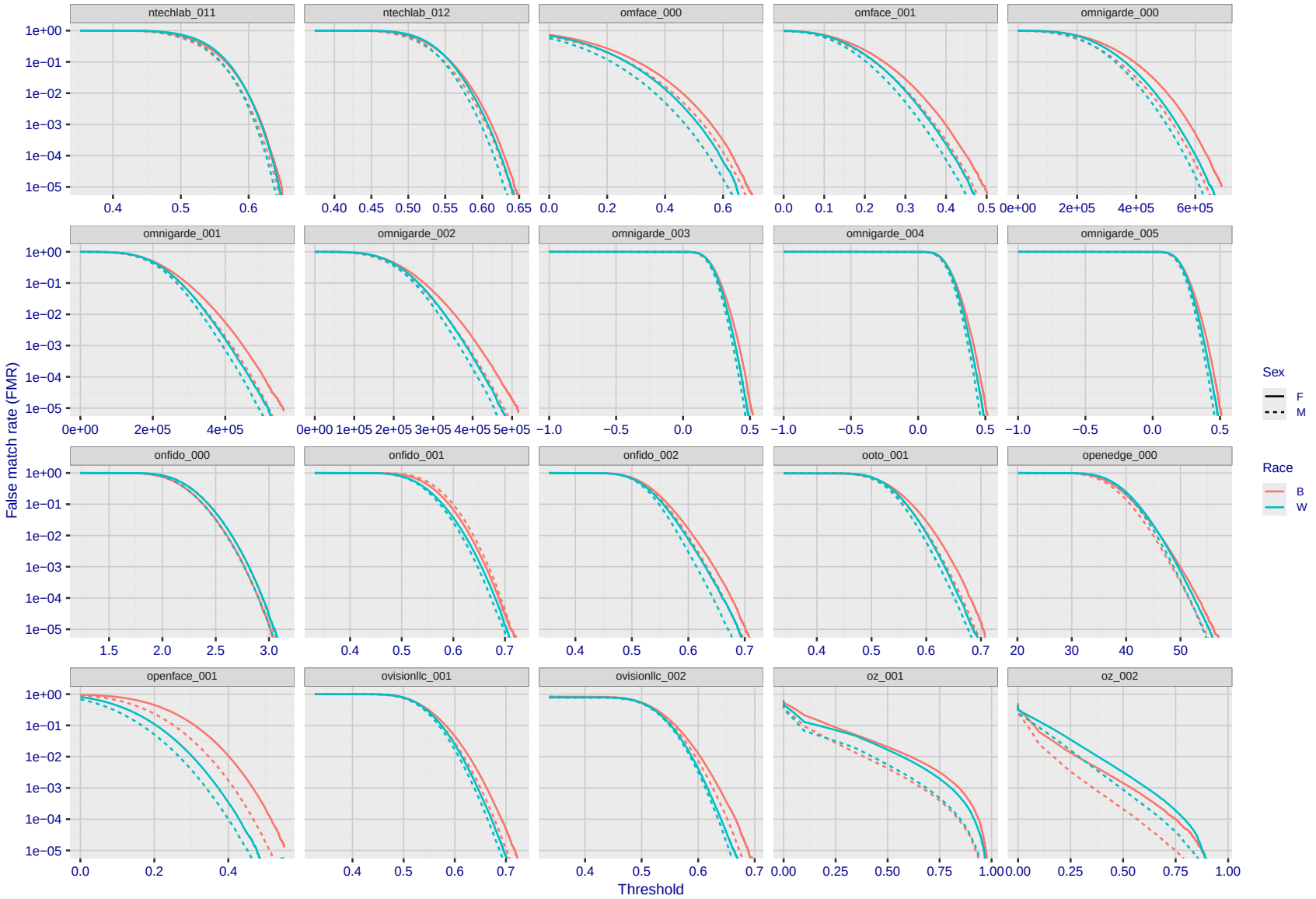

Figure 571: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

2026/01/23 11:36:01
FNMR(T) "False non-match rate"
FMR(T) "False match rate"

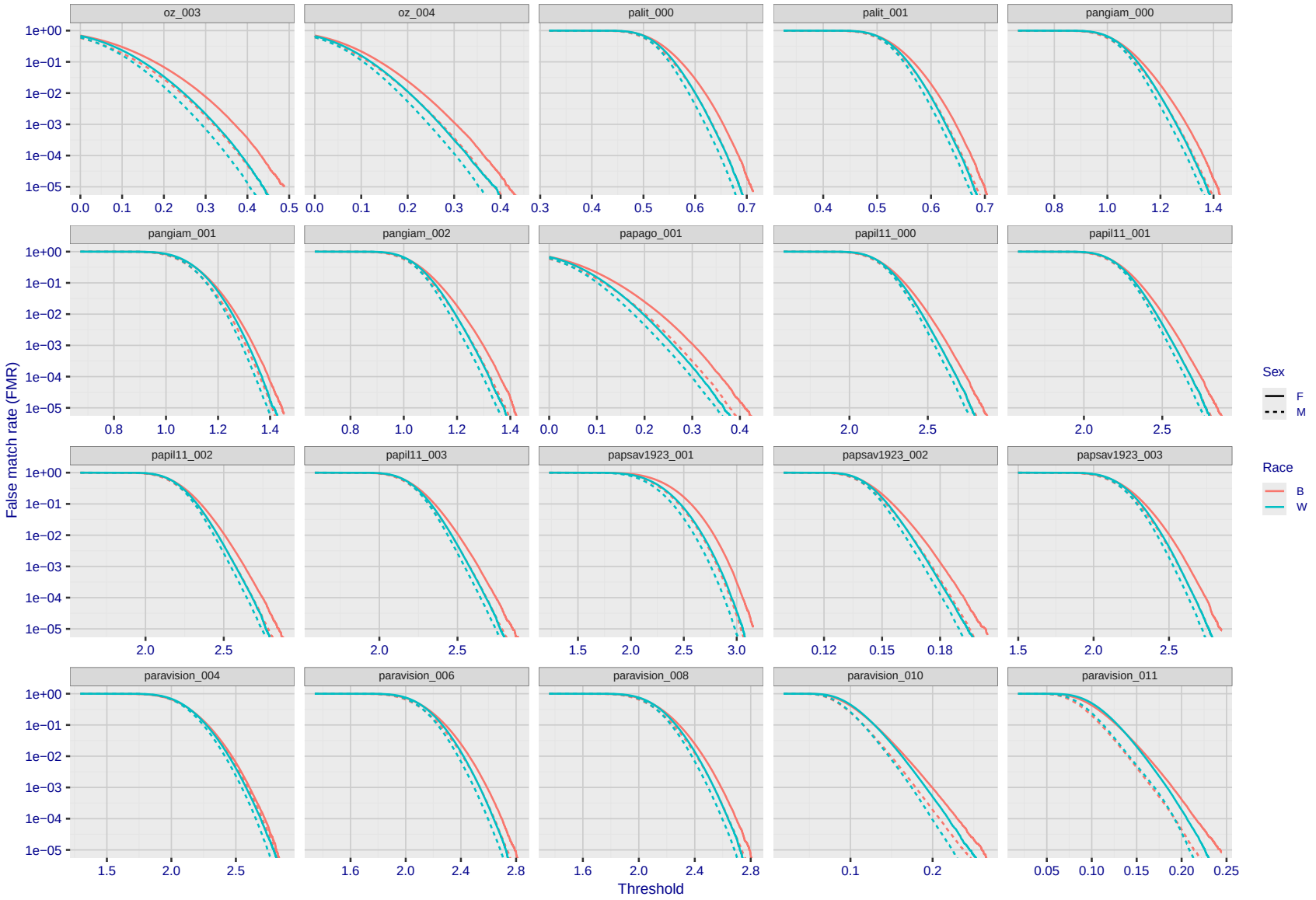

Figure 572: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

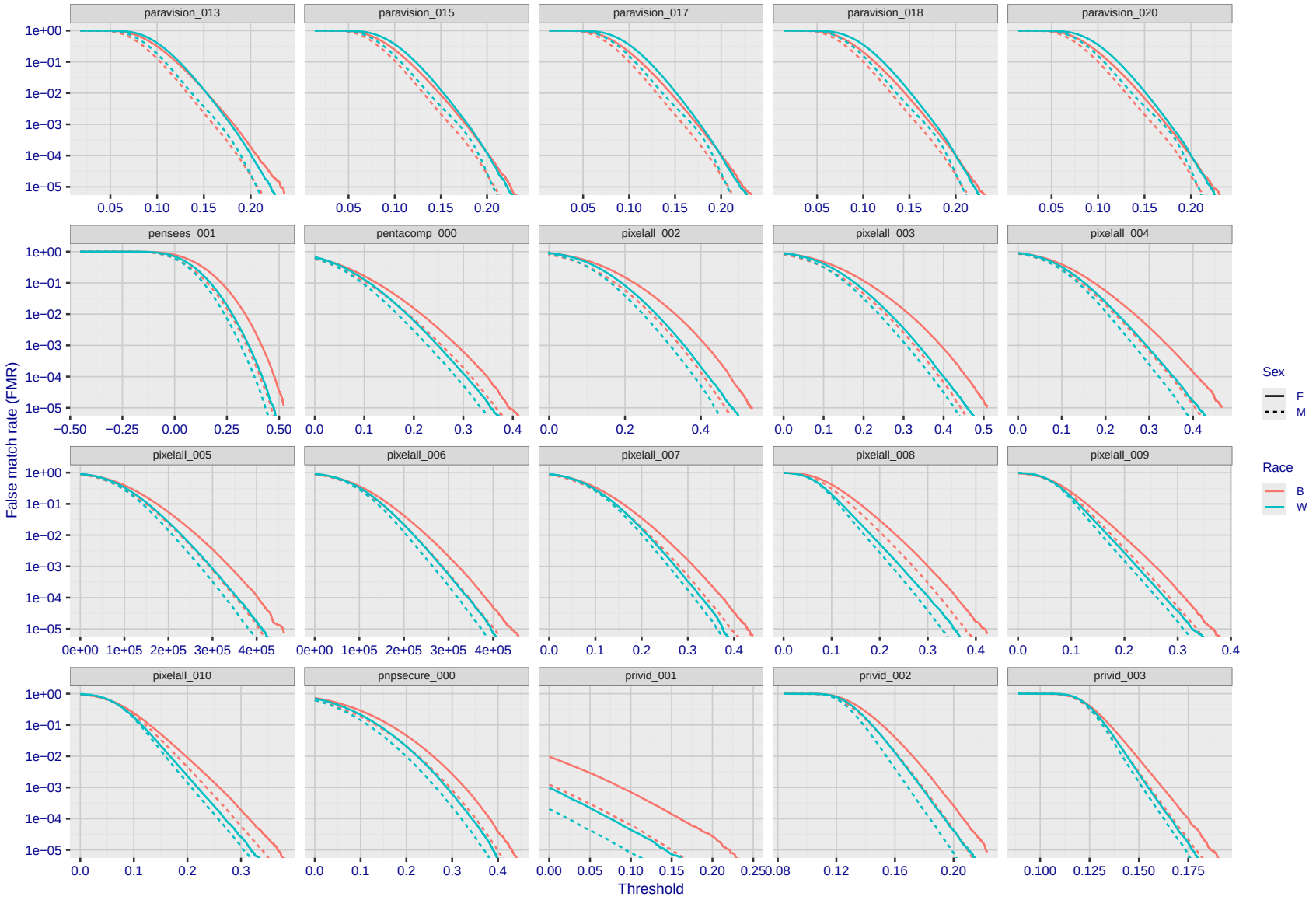

Figure 573: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

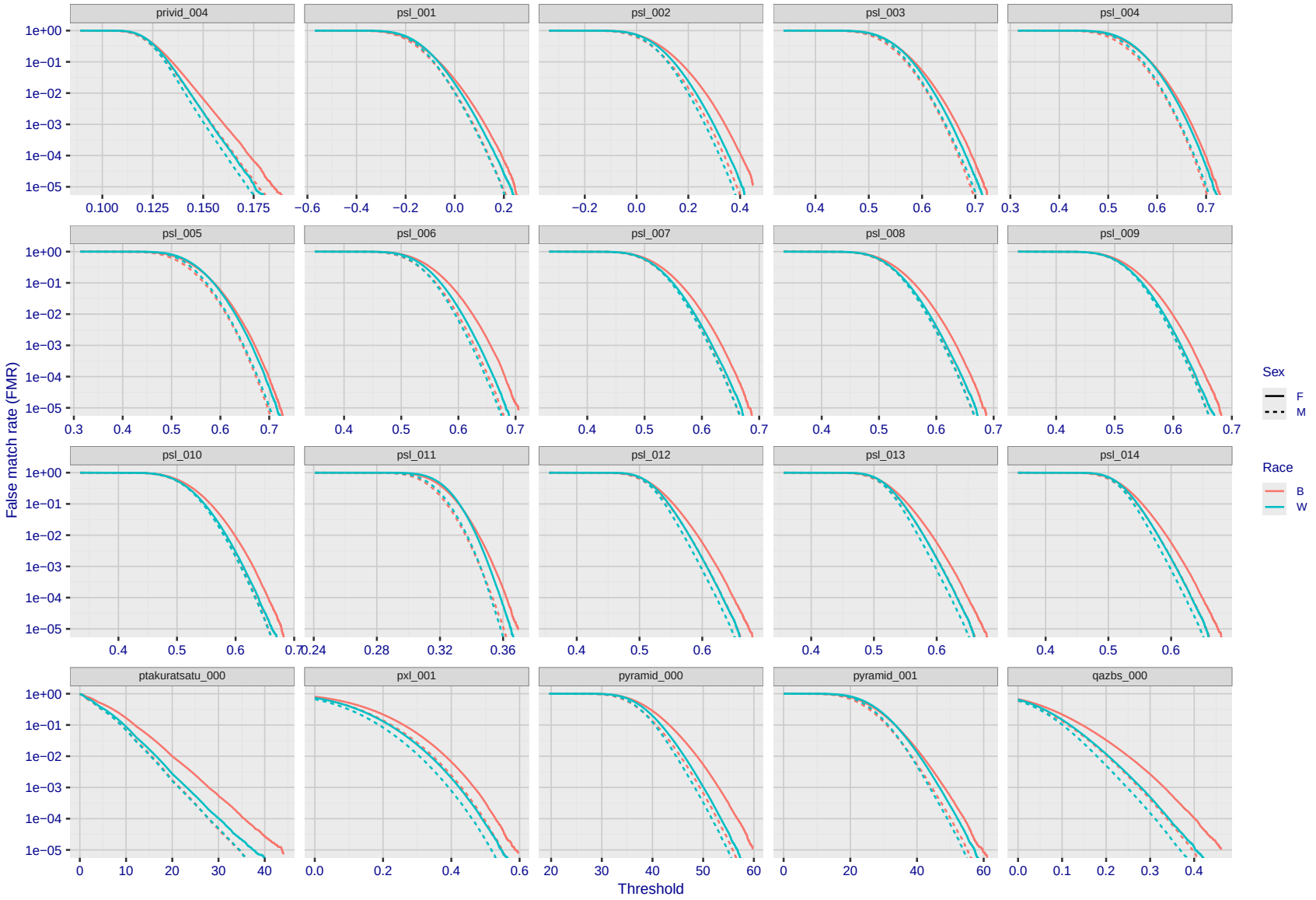

Figure 574: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

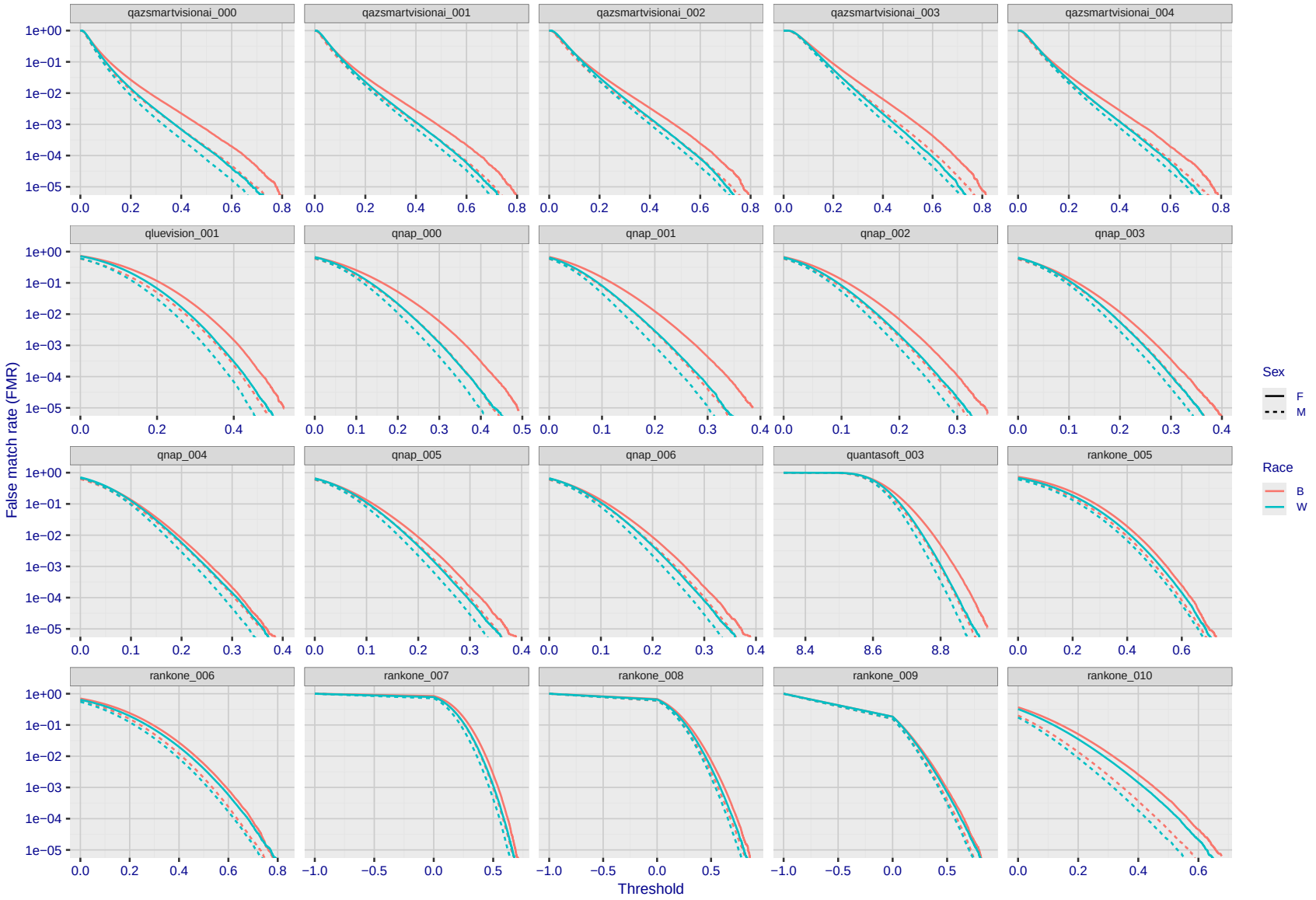

Figure 575: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

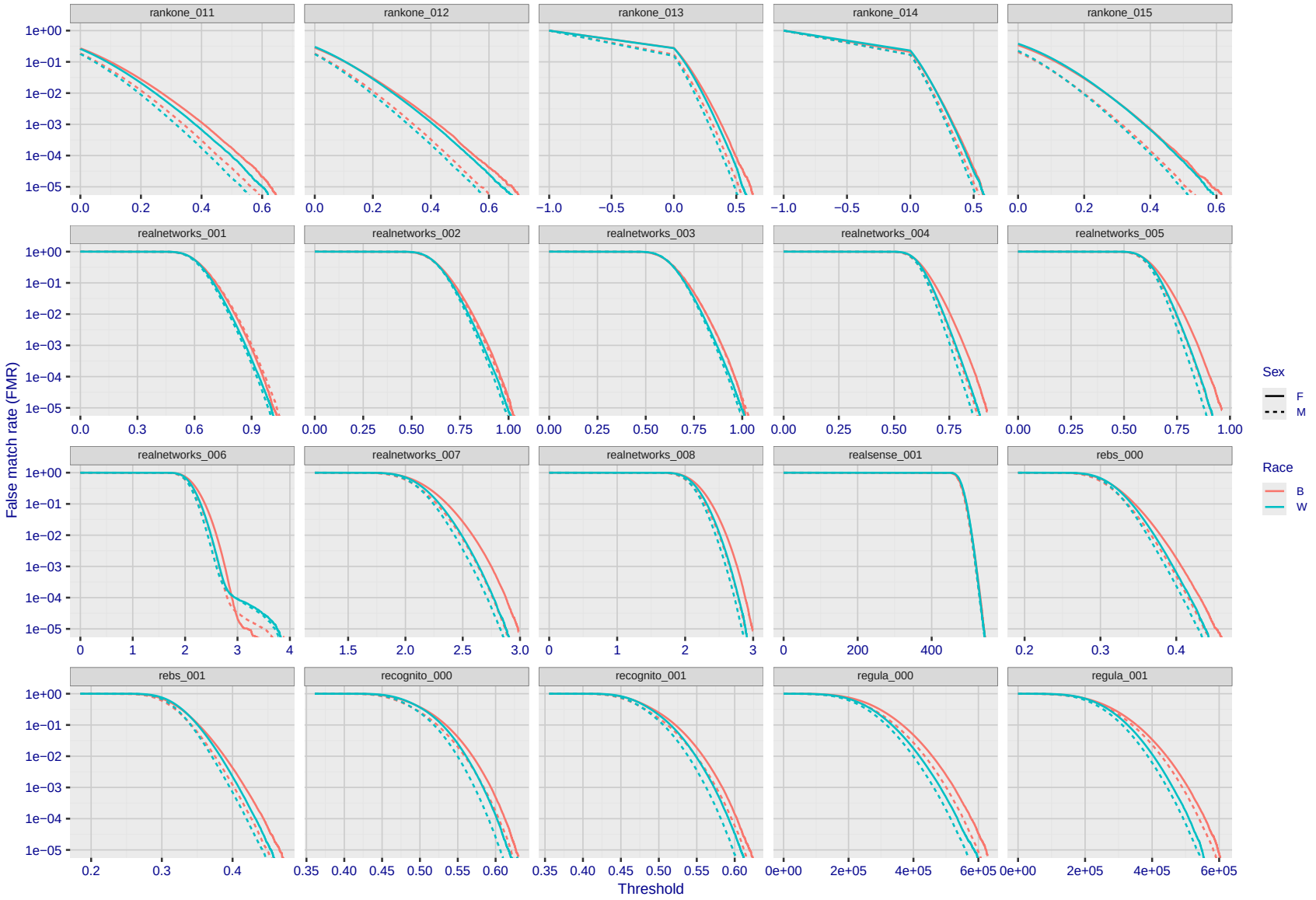

Figure 576: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

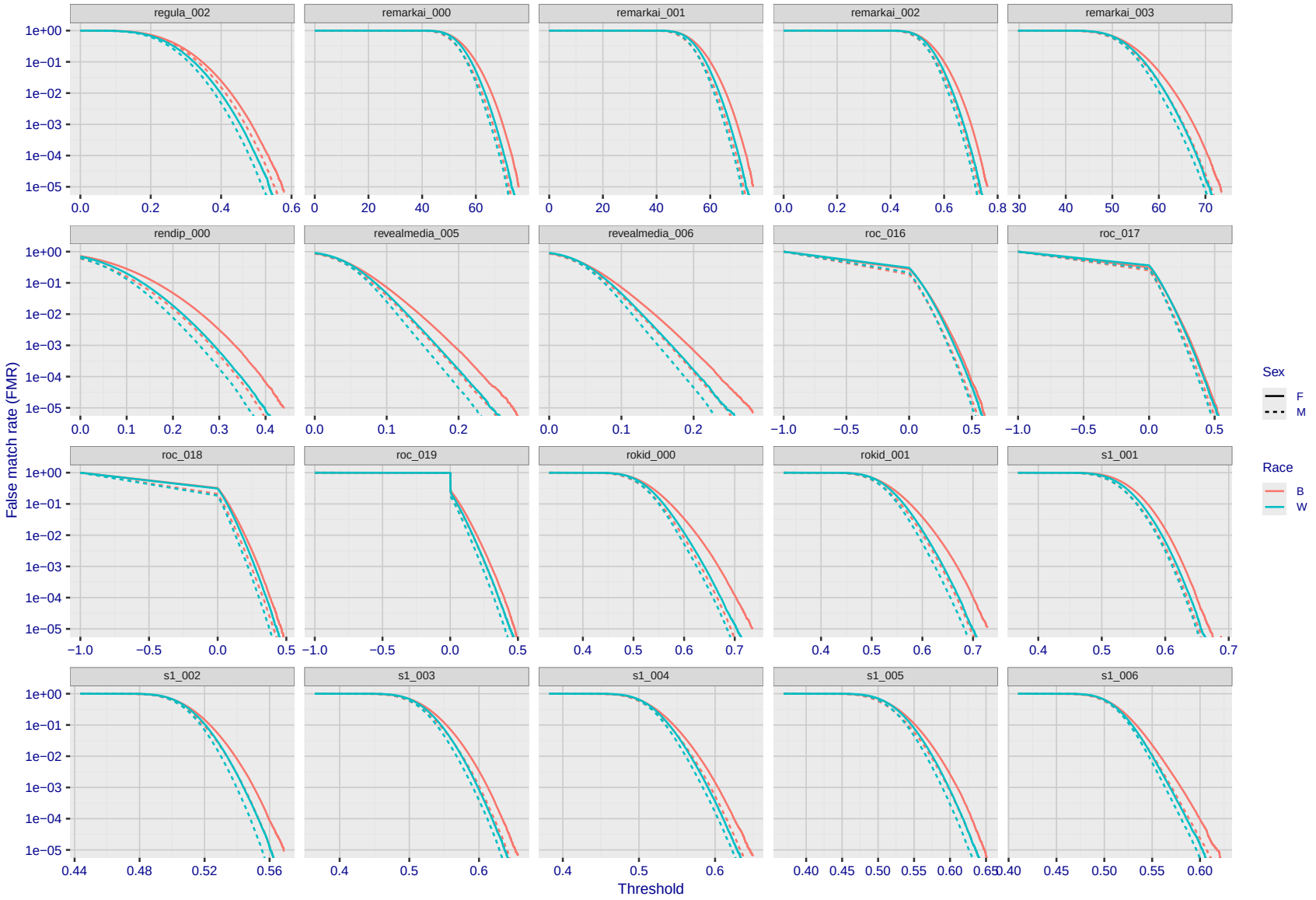

Figure 577: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

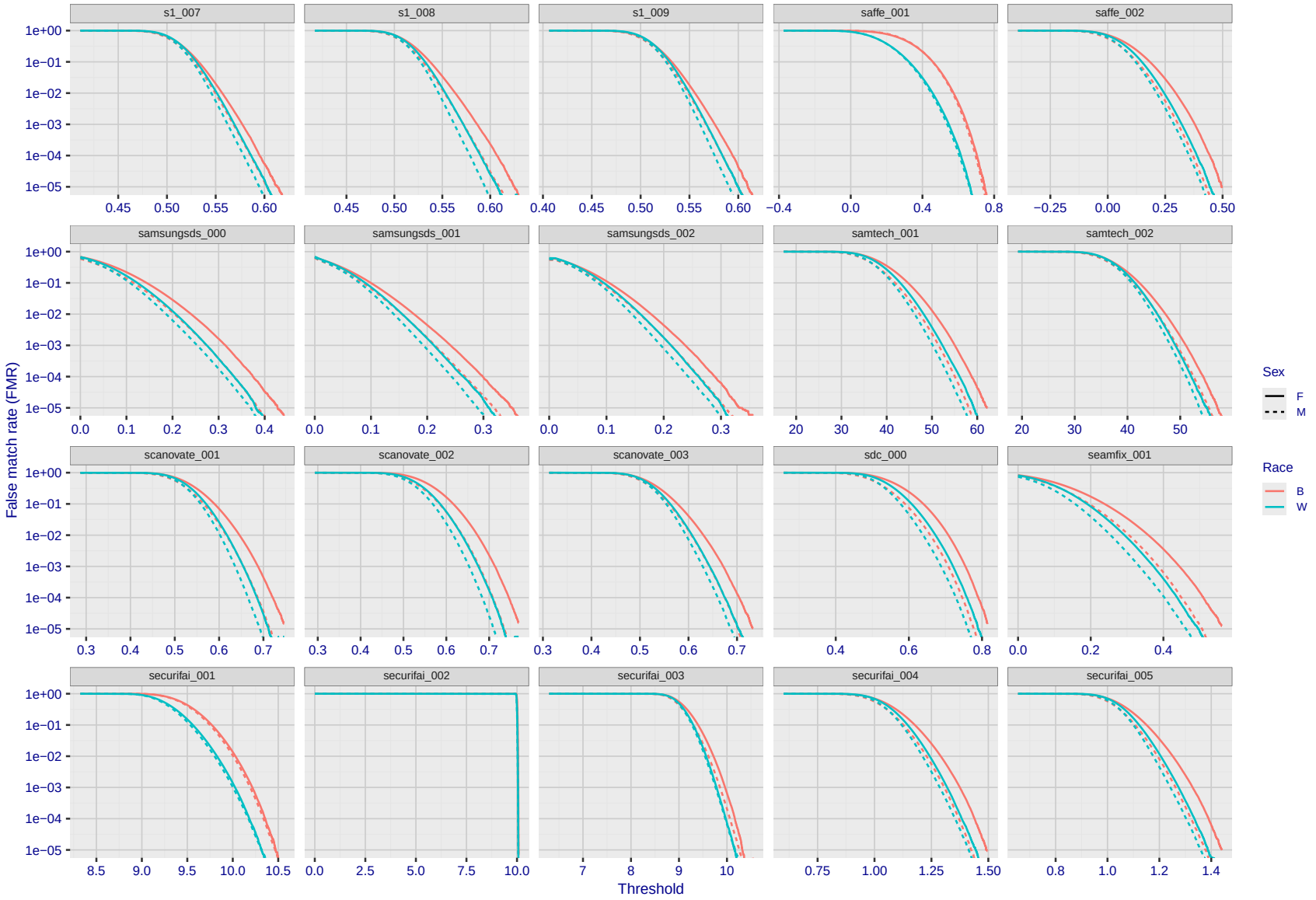

Figure 578: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

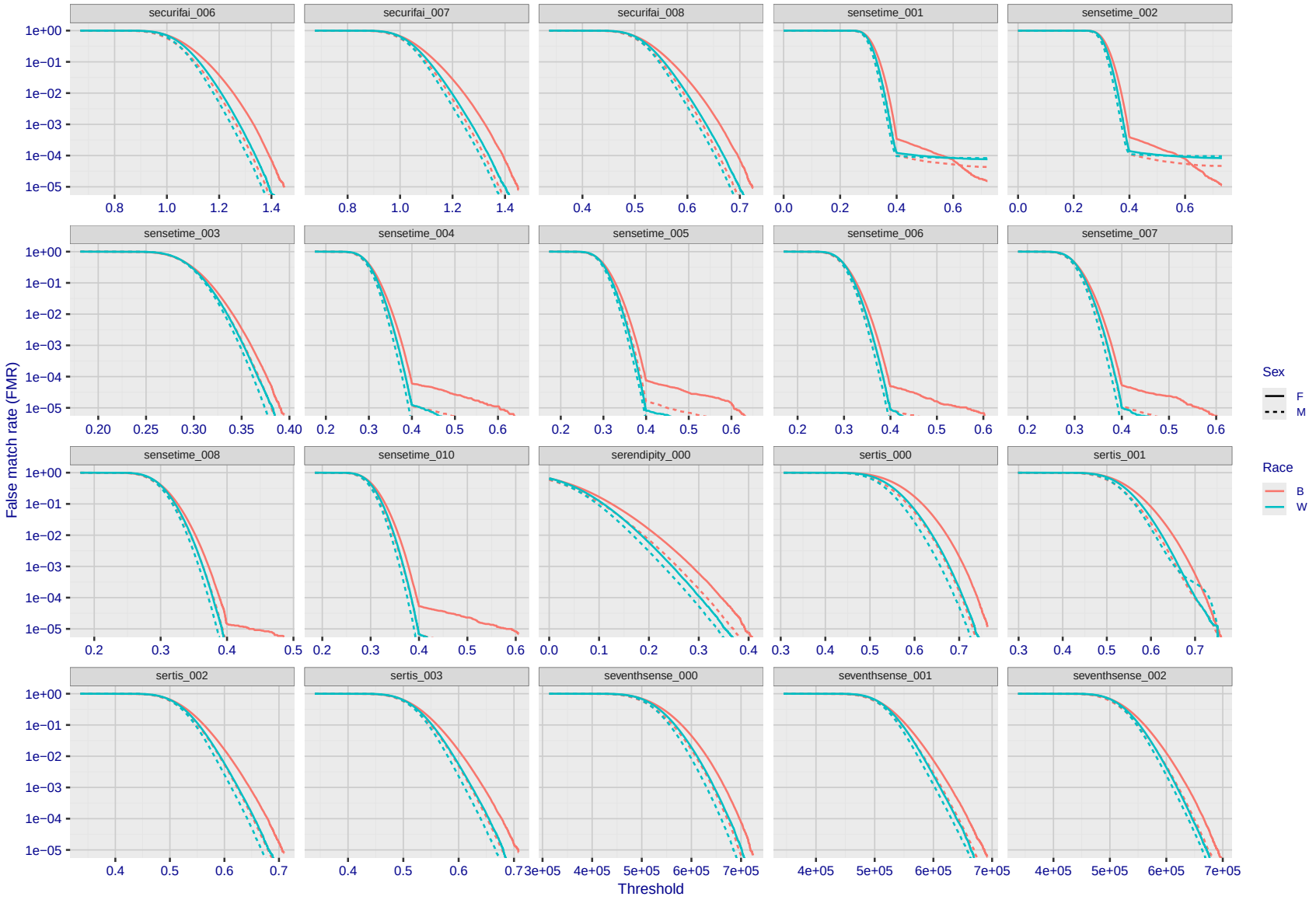

Figure 579: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

2026/01/23 11:36:01 "False non-match rate" FNMR(T) "False match rate" FMR(T)

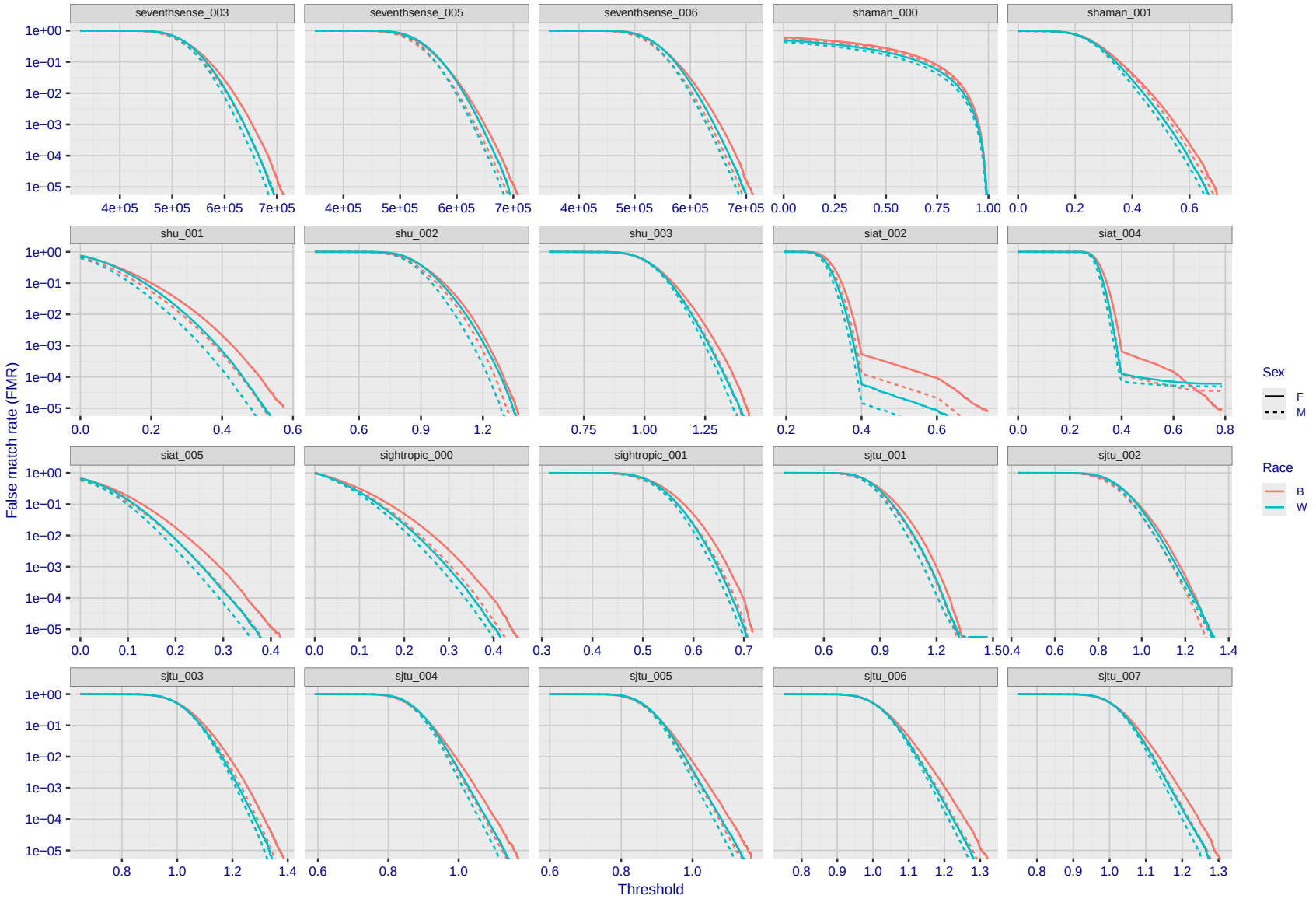

Figure 580: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

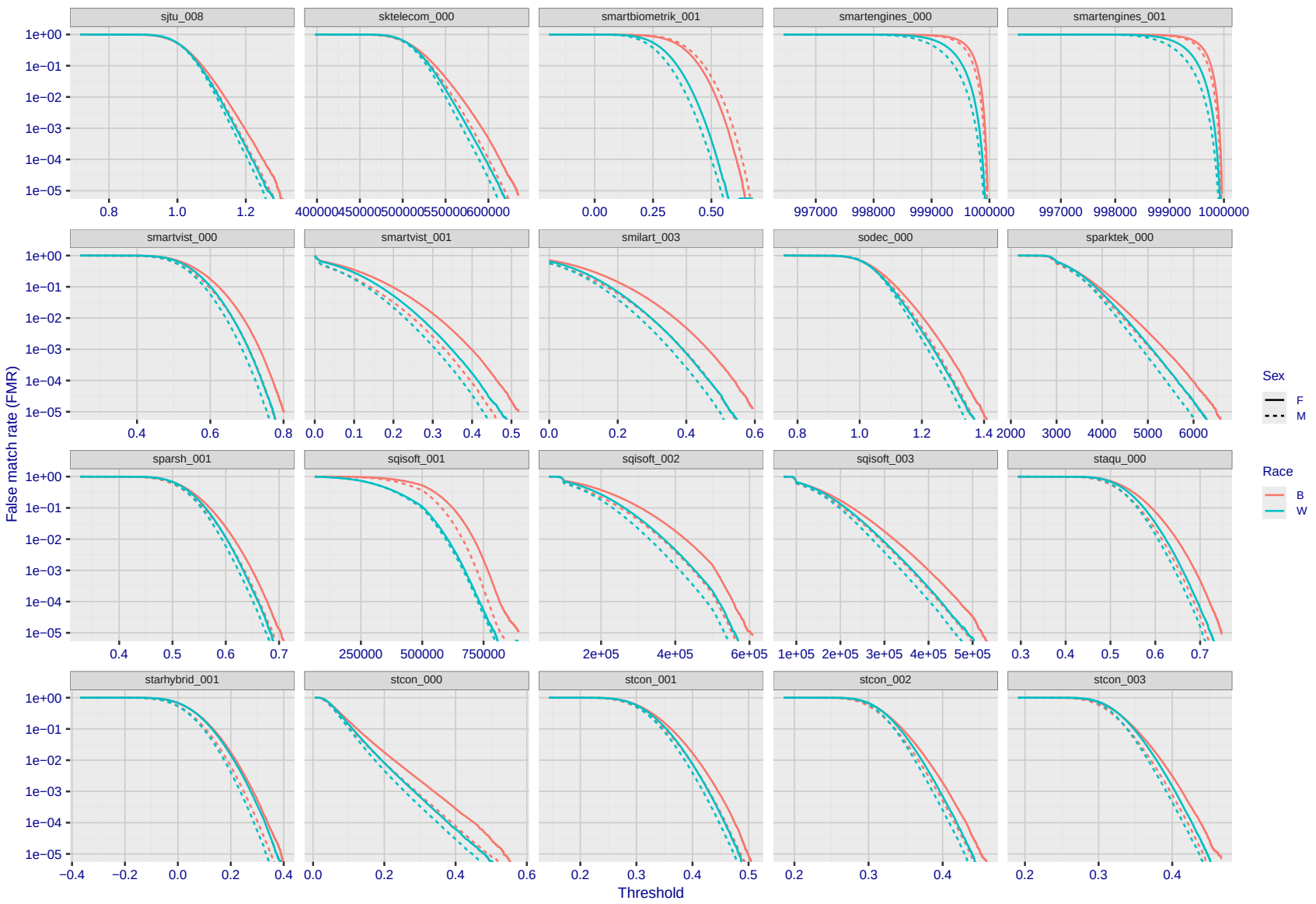

Figure 581: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

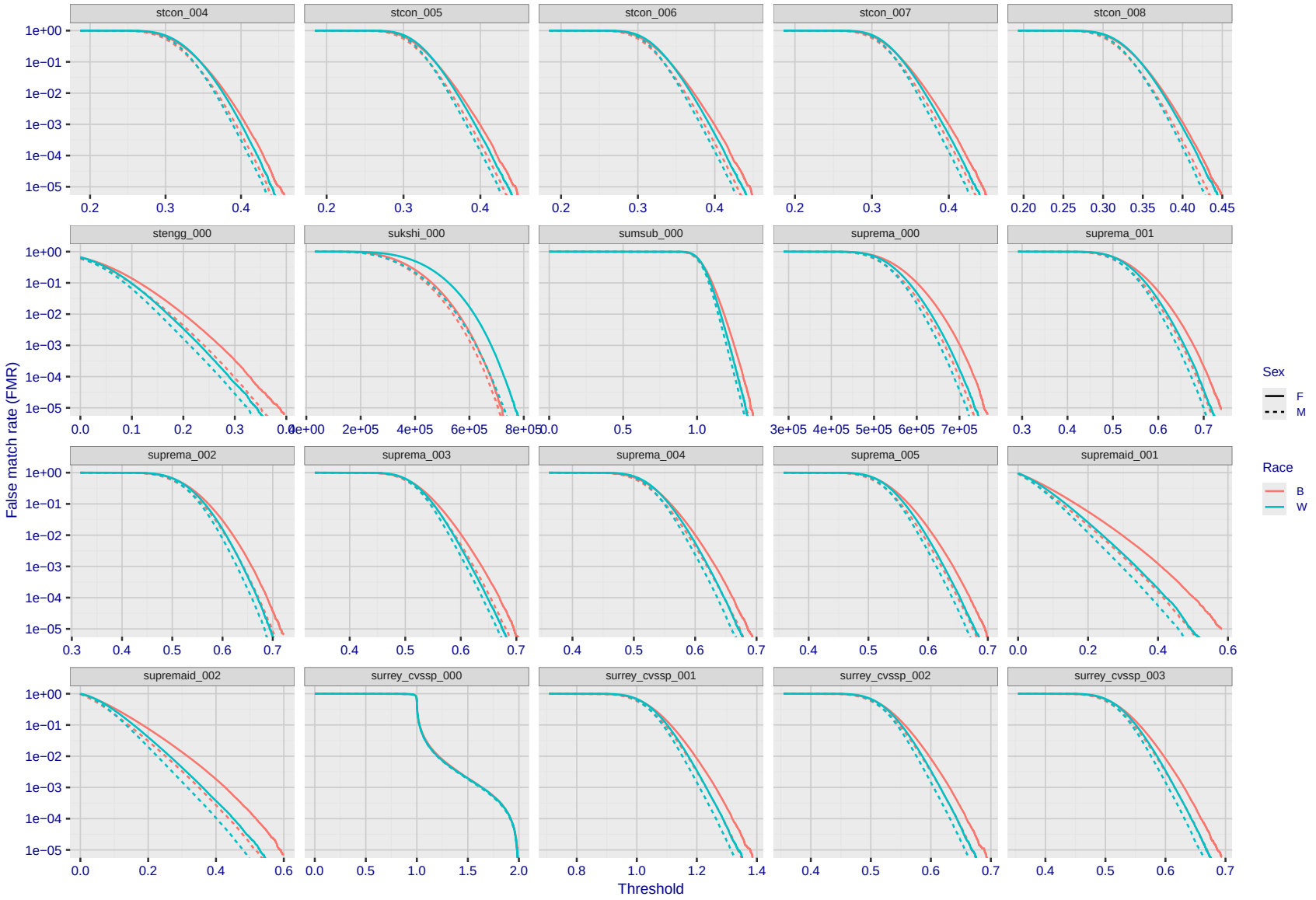

Figure 582: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

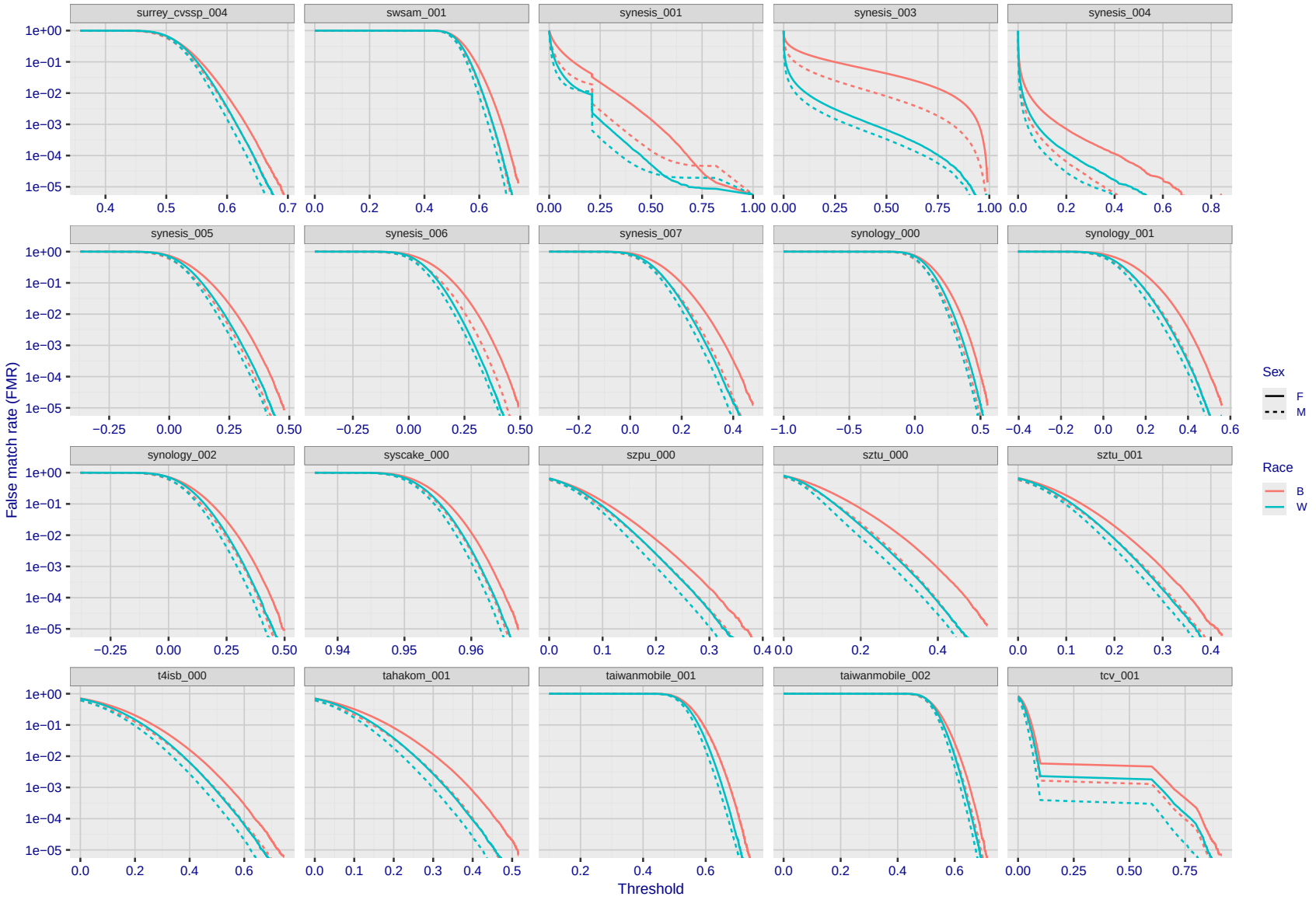

Figure 583: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

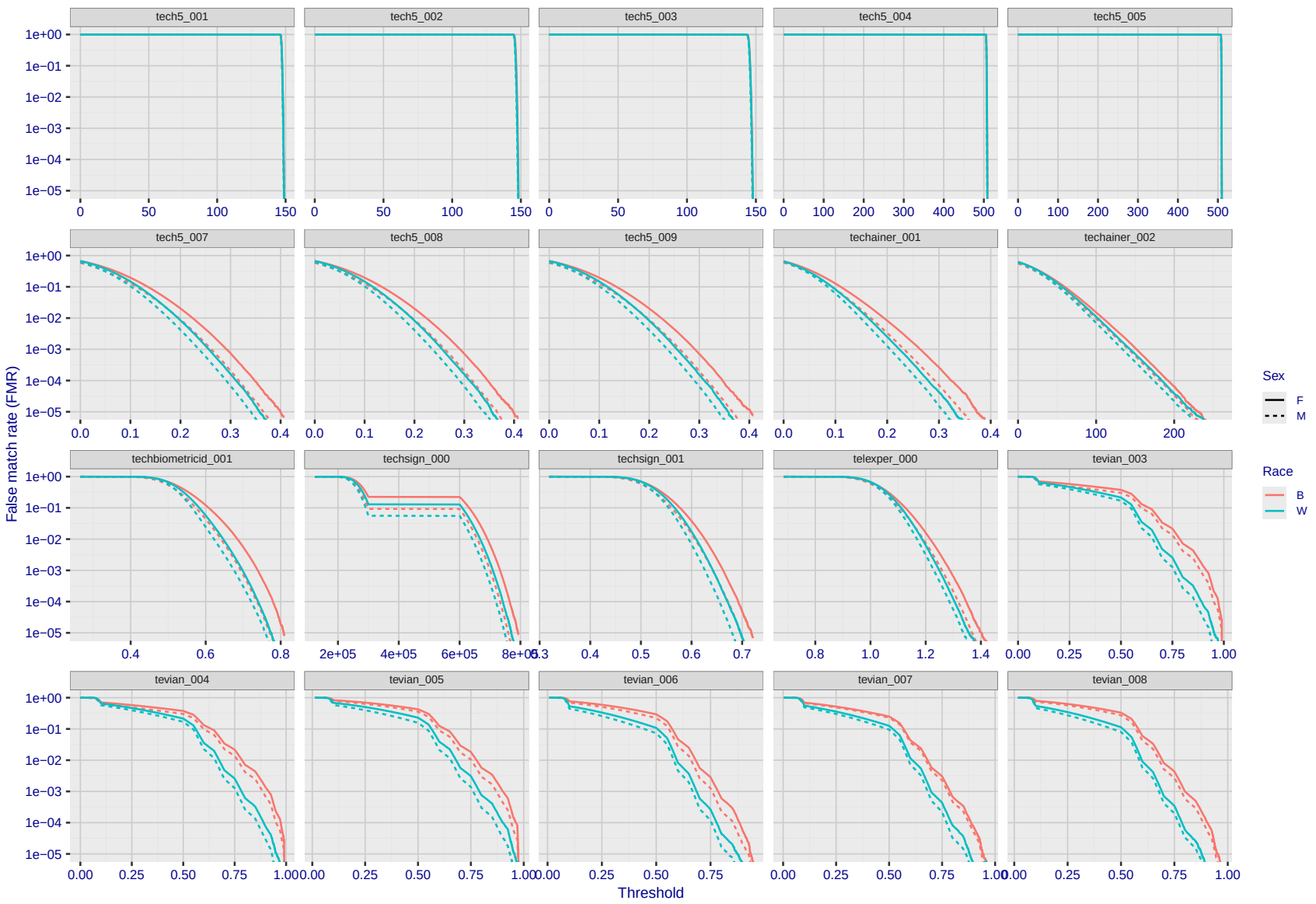

Figure 584: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

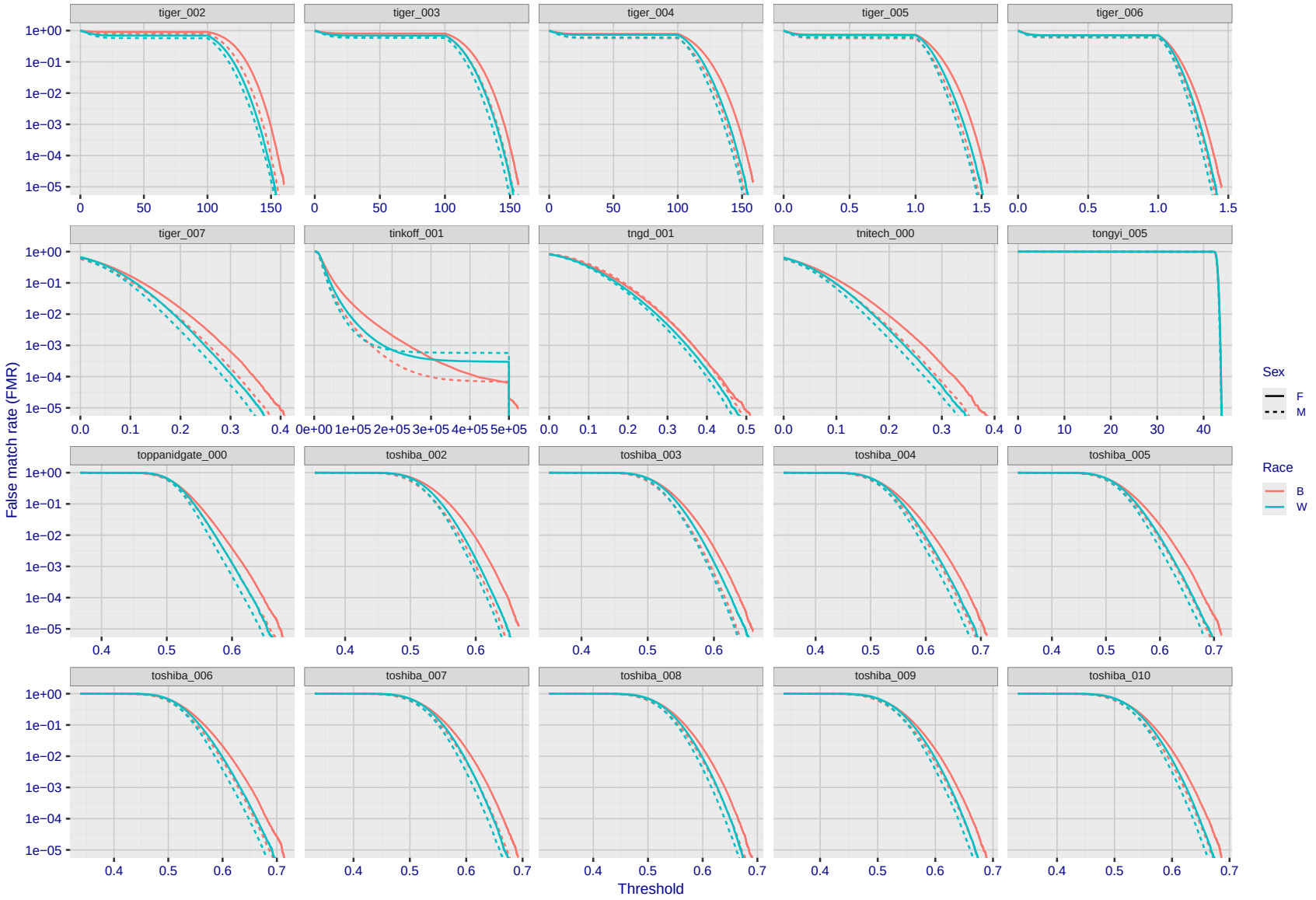

Figure 585: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

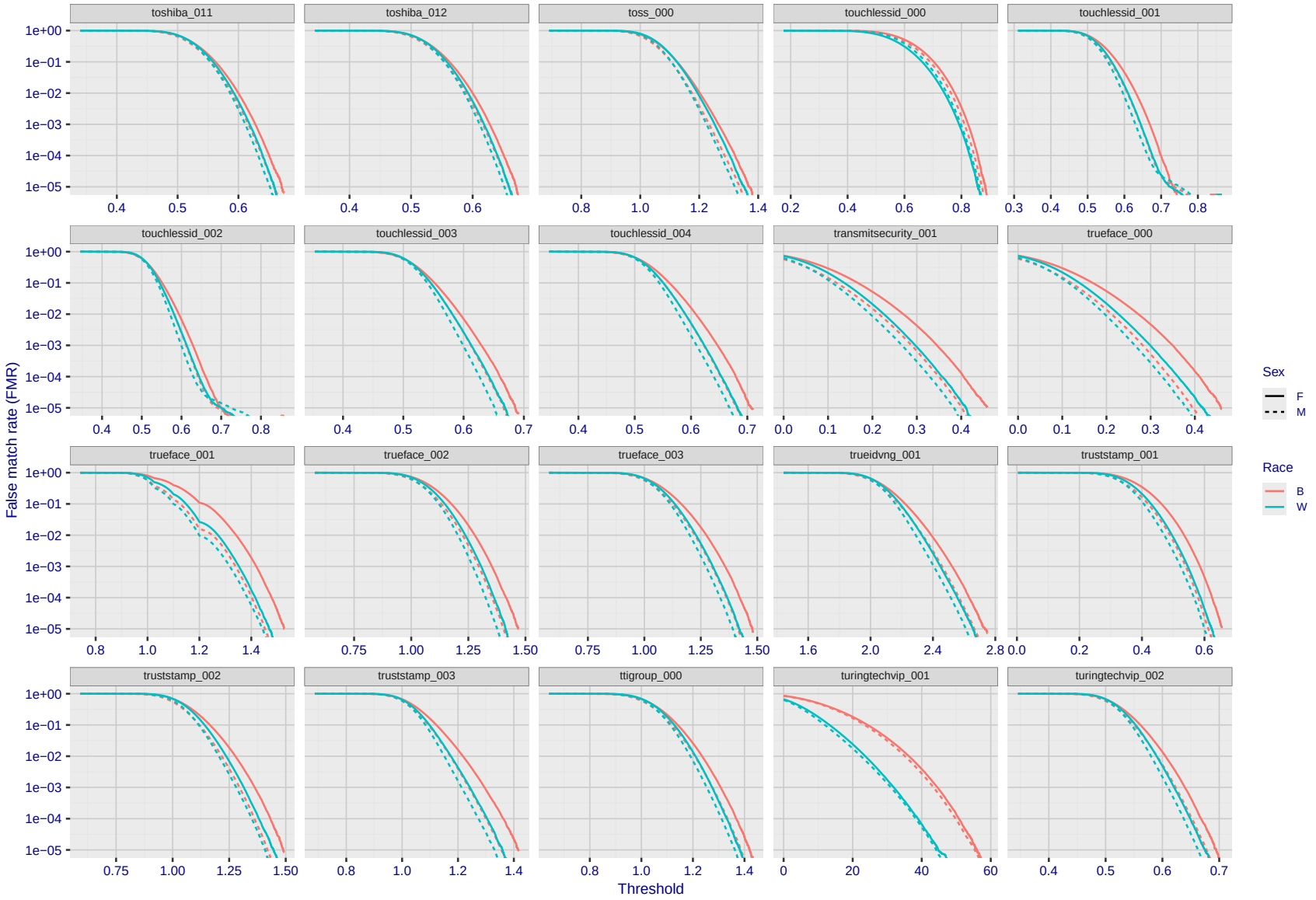

Figure 586: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

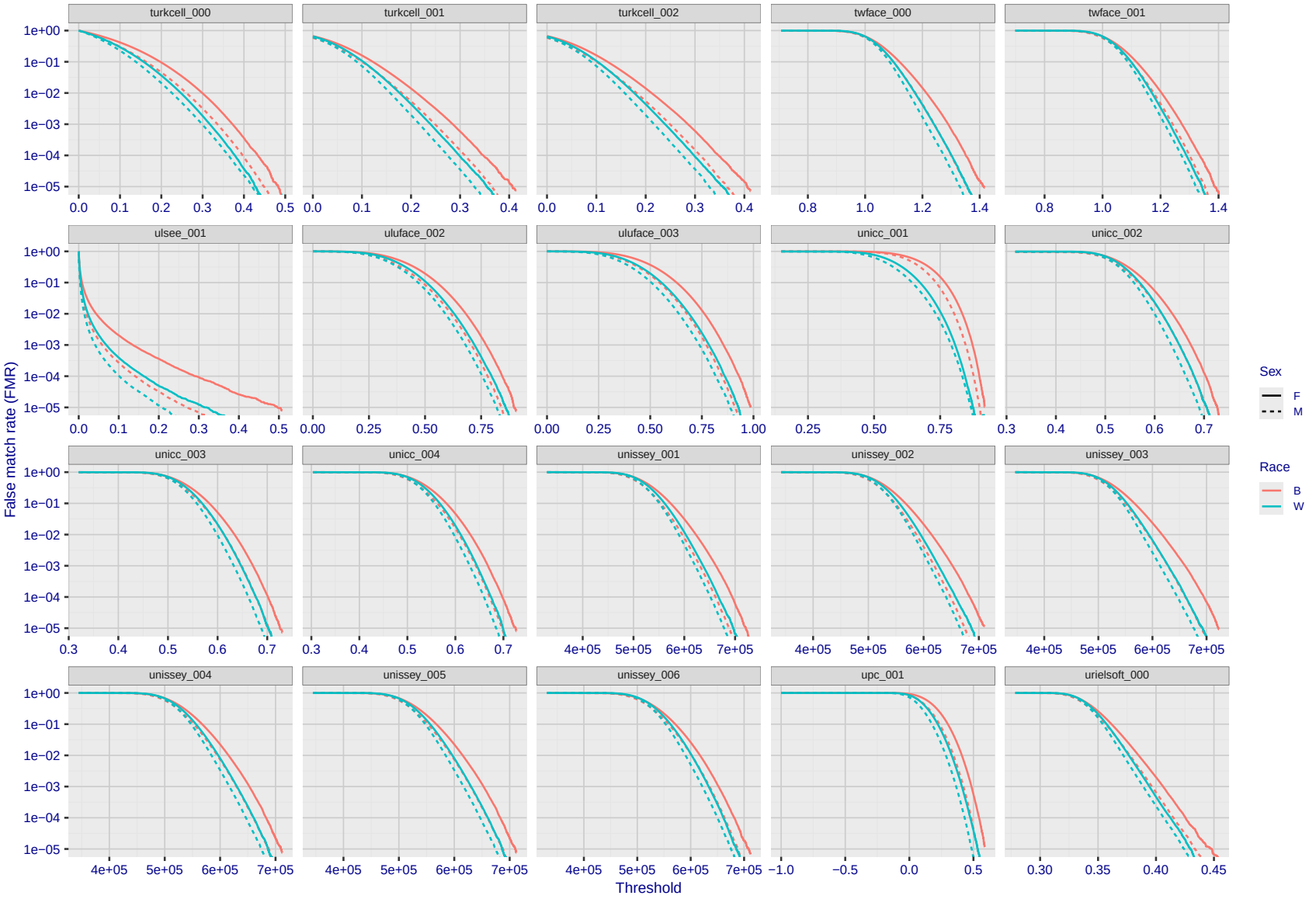

Figure 587: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

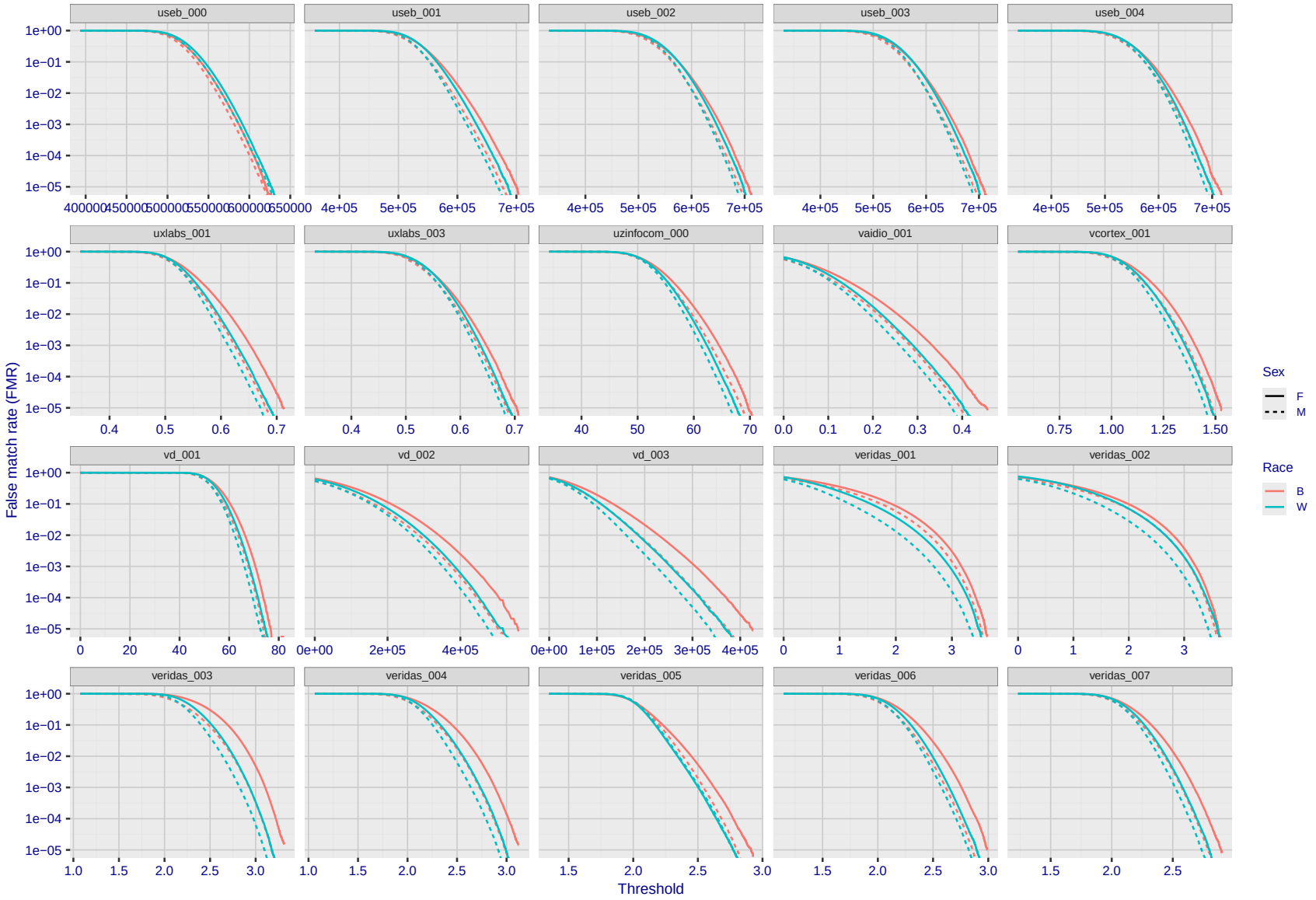

Figure 588: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

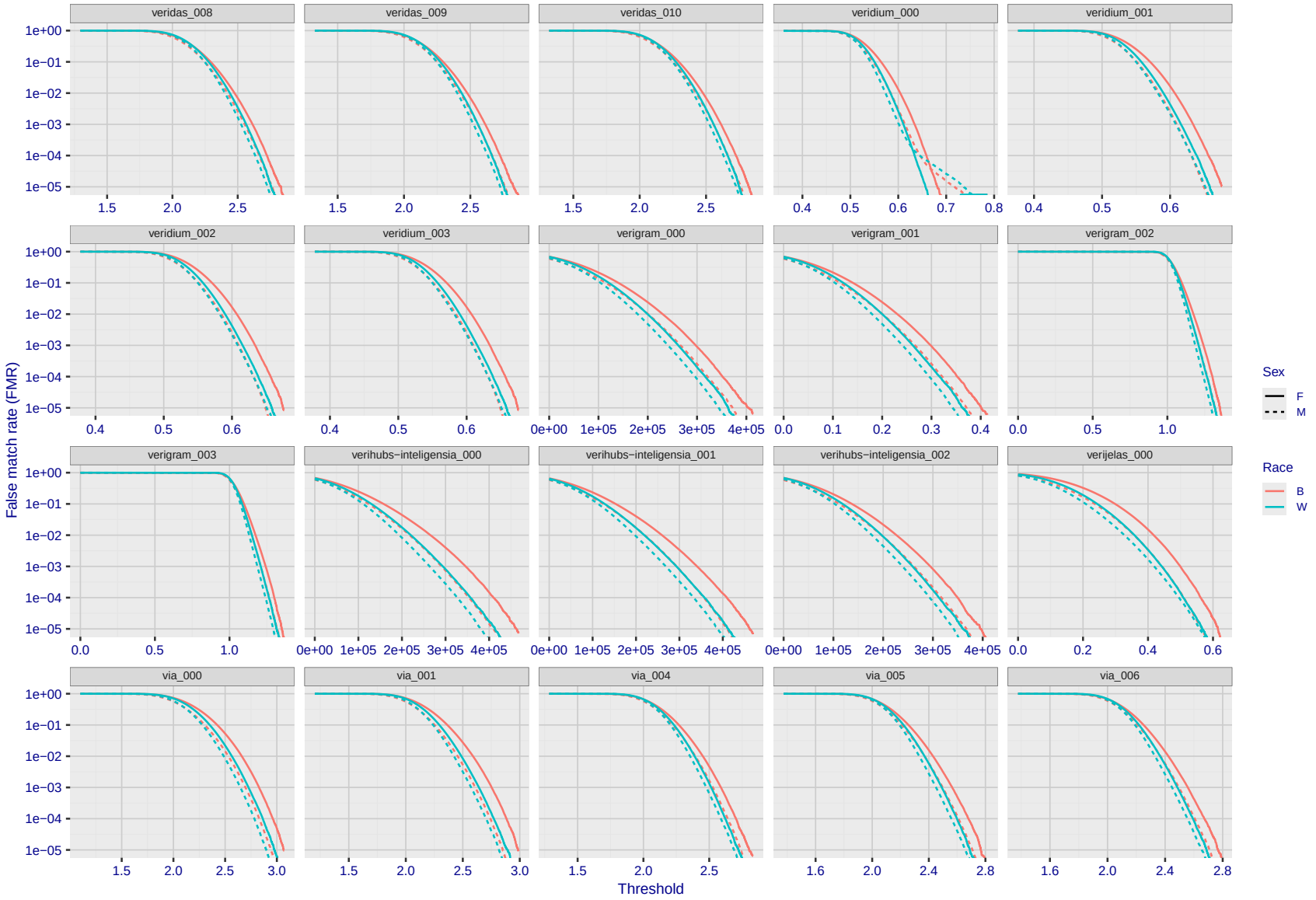

Figure 589: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

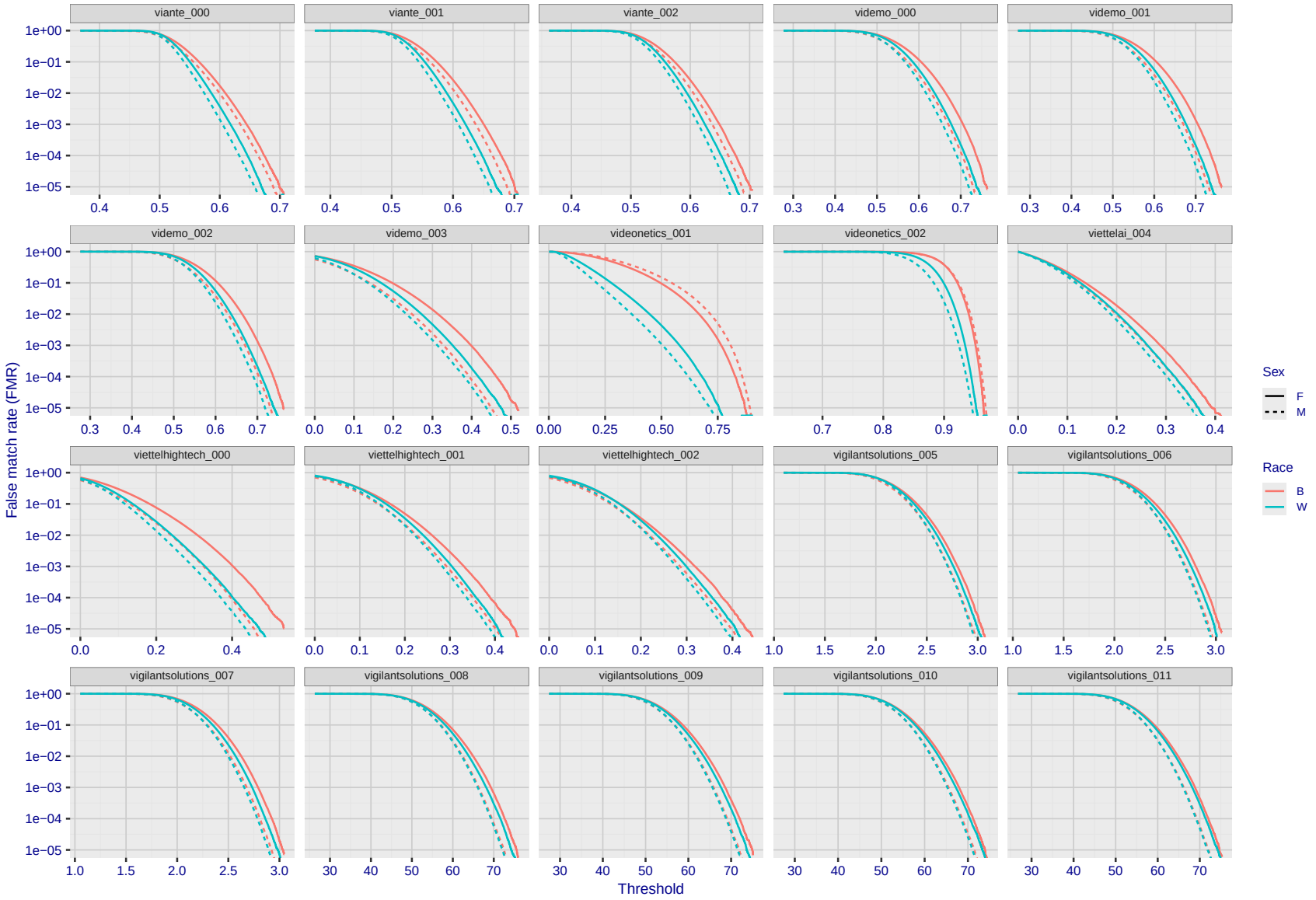

Figure 590: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

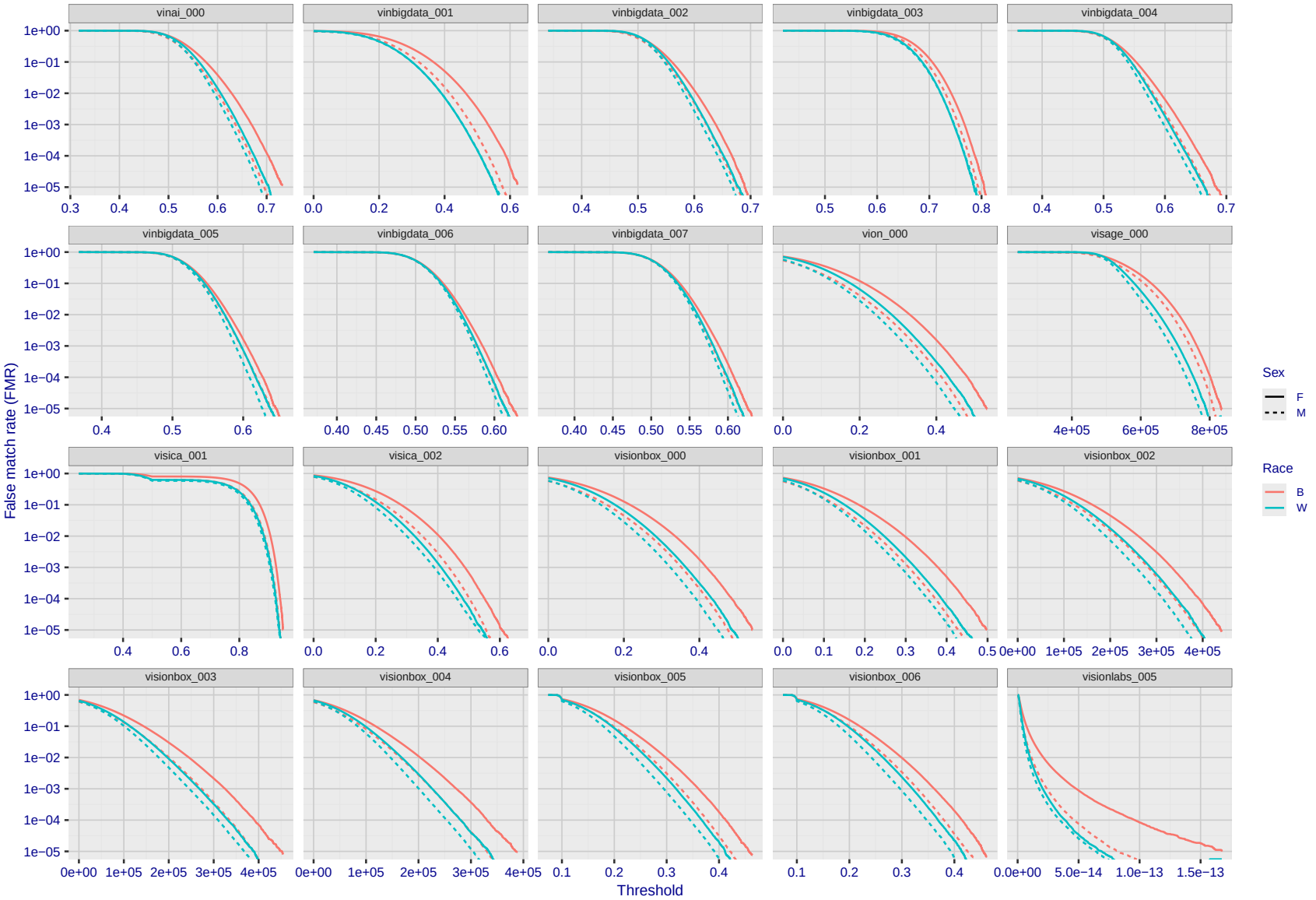

Figure 591: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

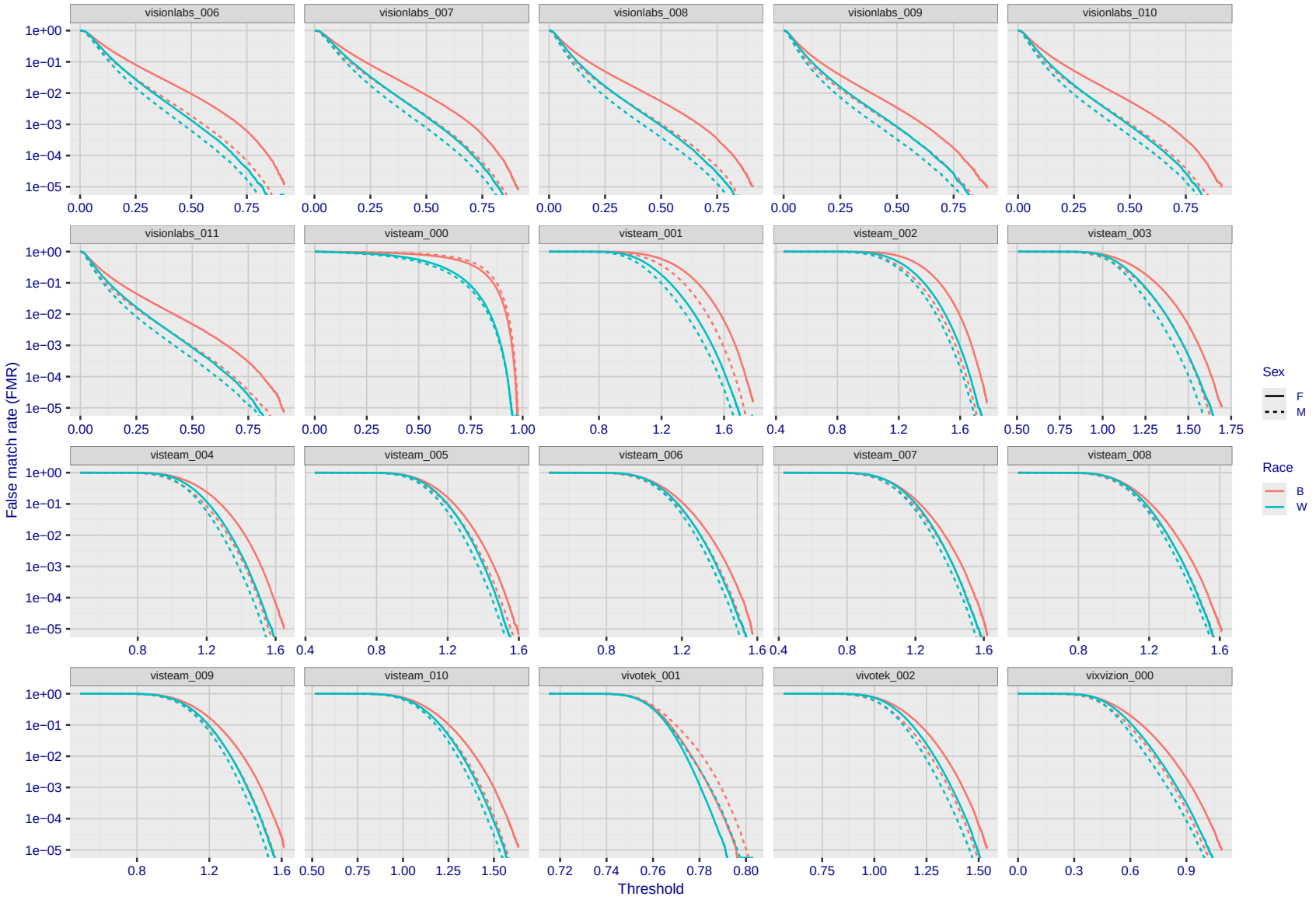

Figure 592: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

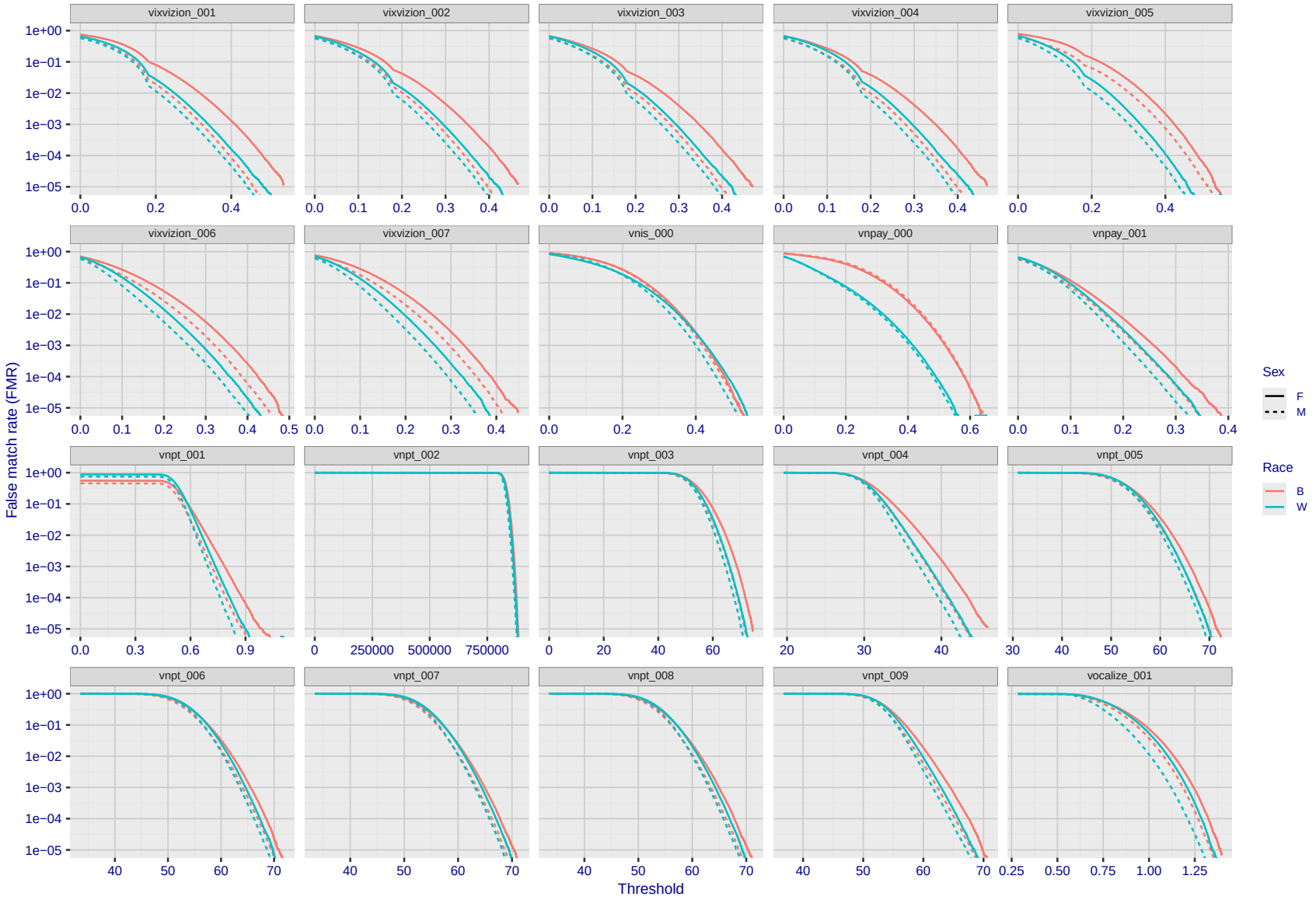

Figure 593: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

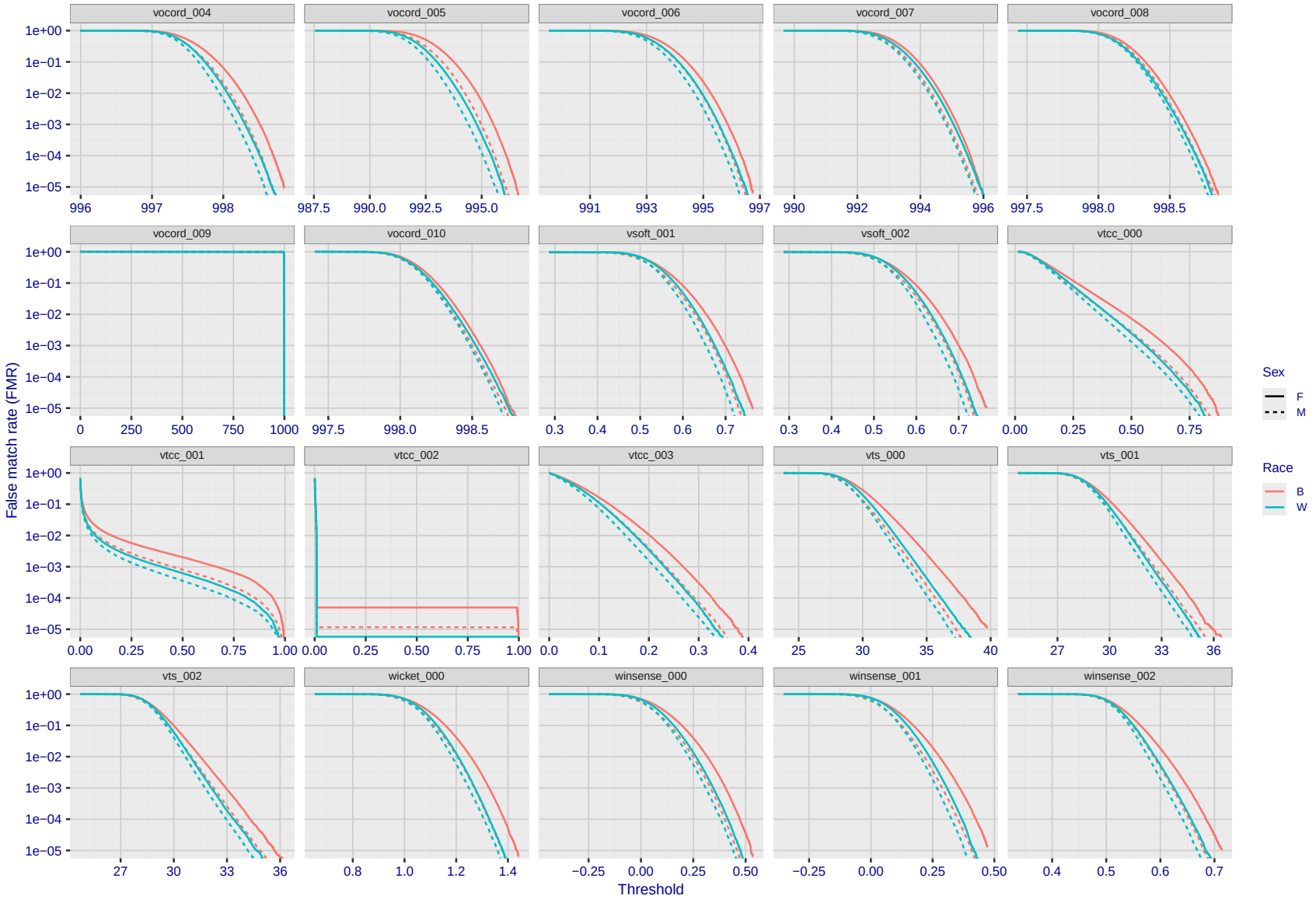

Figure 594: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

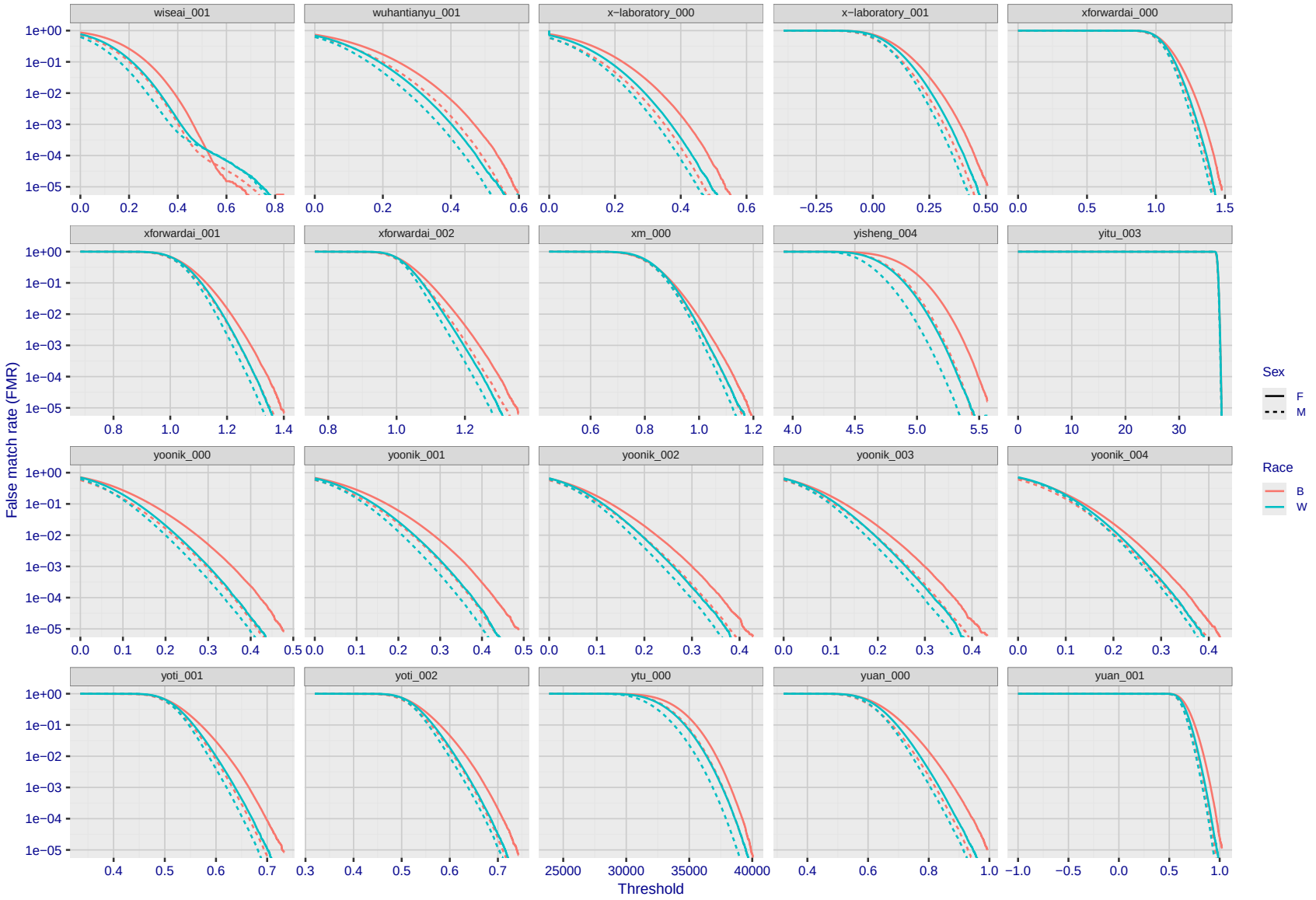

Figure 595: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

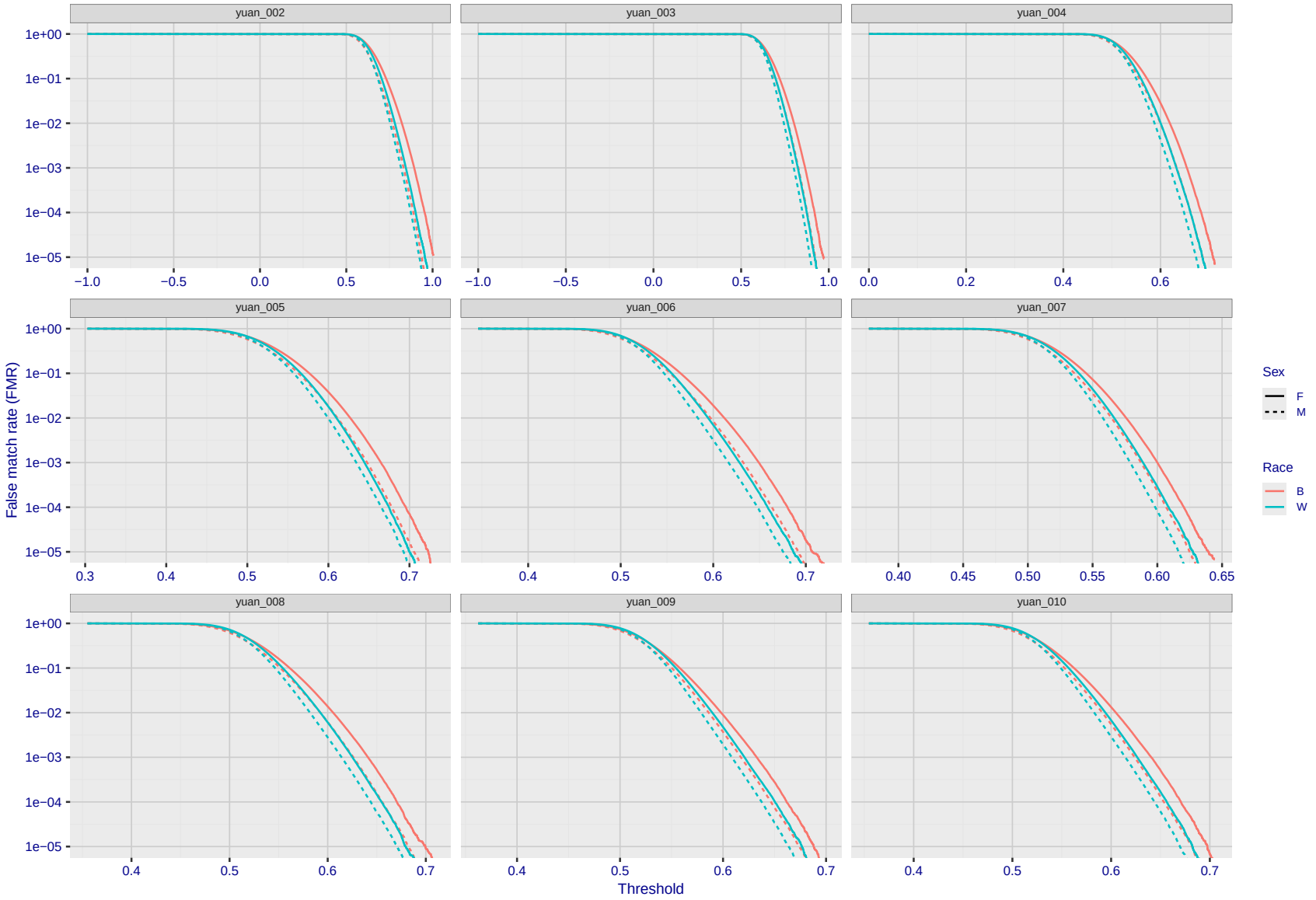

Figure 596: For the mugshot images, the false match calibration curves show false match rate vs. threshold. Separate curves appear for white females, black females, black males and white males.

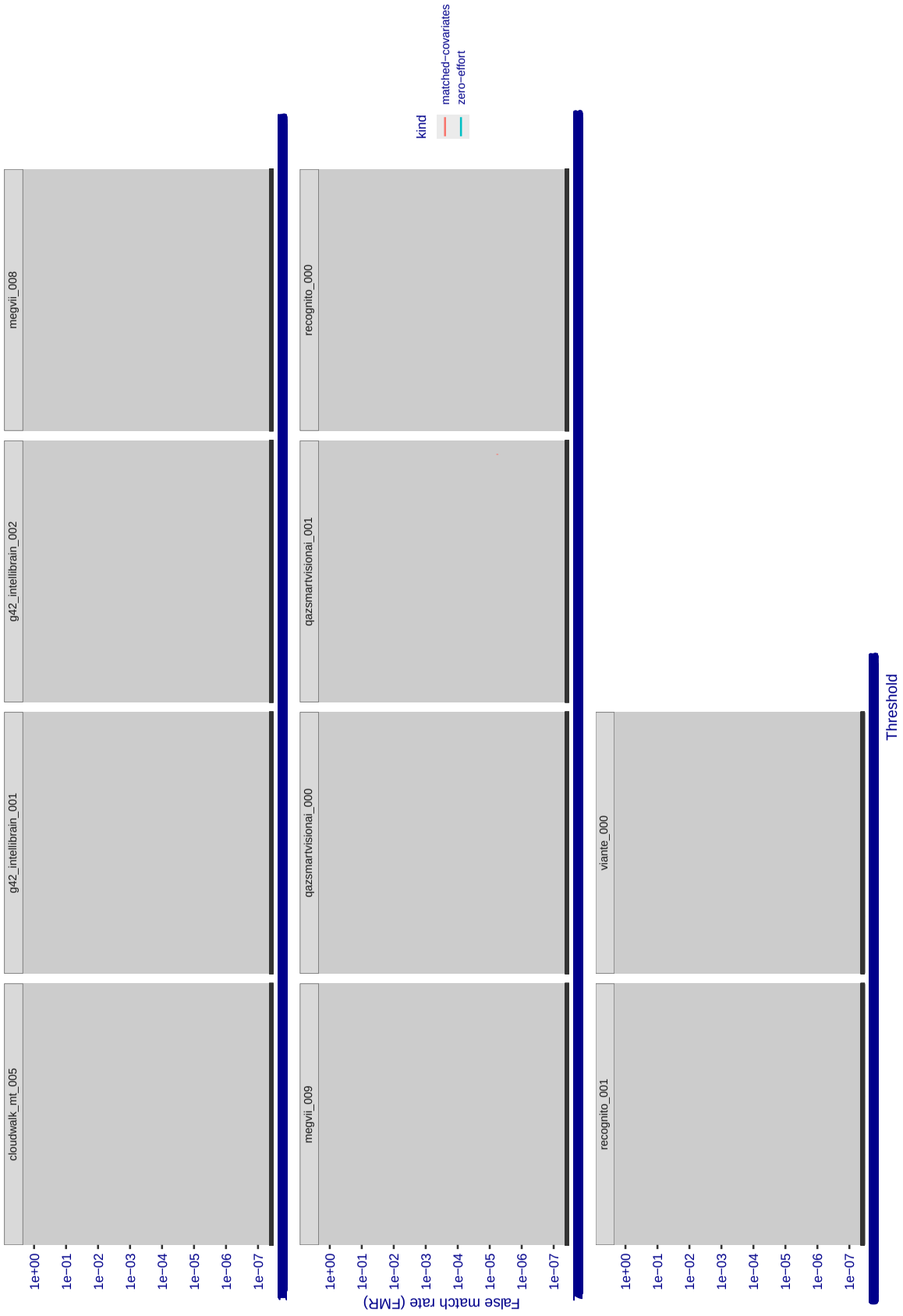

Figure 597: For the visa images, the false match calibration curves show FMR vs. threshold, T. The blue (lower) curves are for zero-effort impostors (i.e. comparing all images against all). The red (upper) curves are for persons of the same-sex, same-age, and same national-origin. This shows that FMR is underestimated (by a factor of 10 or more) by using a zero-effort impostor calculation to calibrate T. As shown later (sec. 3.6), FMR is higher for demographic-matched impostors.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.5 Genuine distribution stability

3.5.1 Effect of birth place on the genuine distribution

Background: Both skin tone and bone structure vary geographically. Prior studies have reported variations in FNMR and FMR.

Goal: To measure false non-match rate (FNMR) variation with country of birth.

Methods: Thresholds are determined that give FMR = $\{0.001, 0.0001\}$ over the entire impostor set. Then FNMR is measured over 1000 bootstrap replications of the genuine scores. Only those countries with at least 140 individuals are included in the analysis.

Results: Figure 687 shows FNMR by country of birth for the two thresholds.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

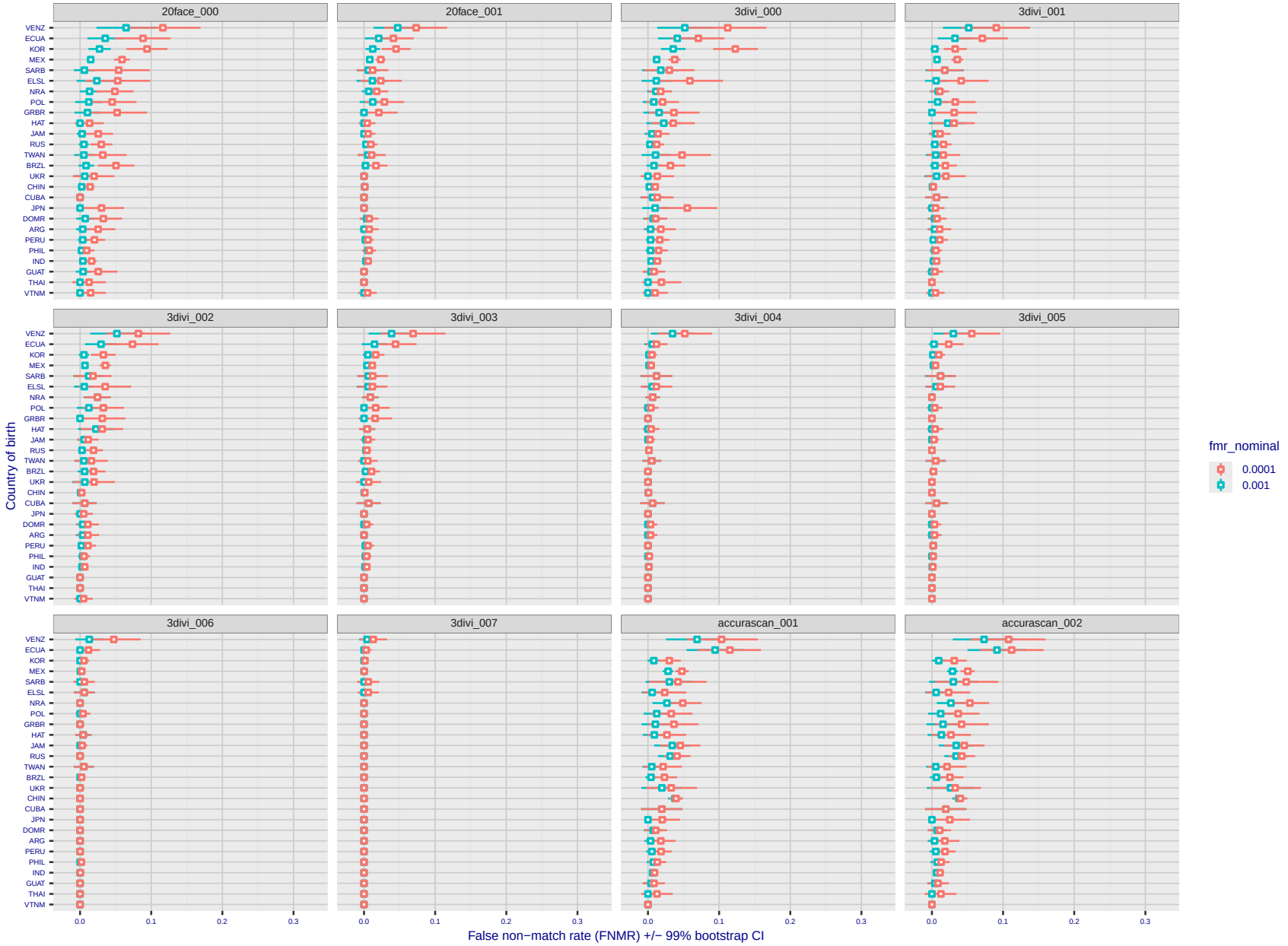

Figure 598: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 599: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

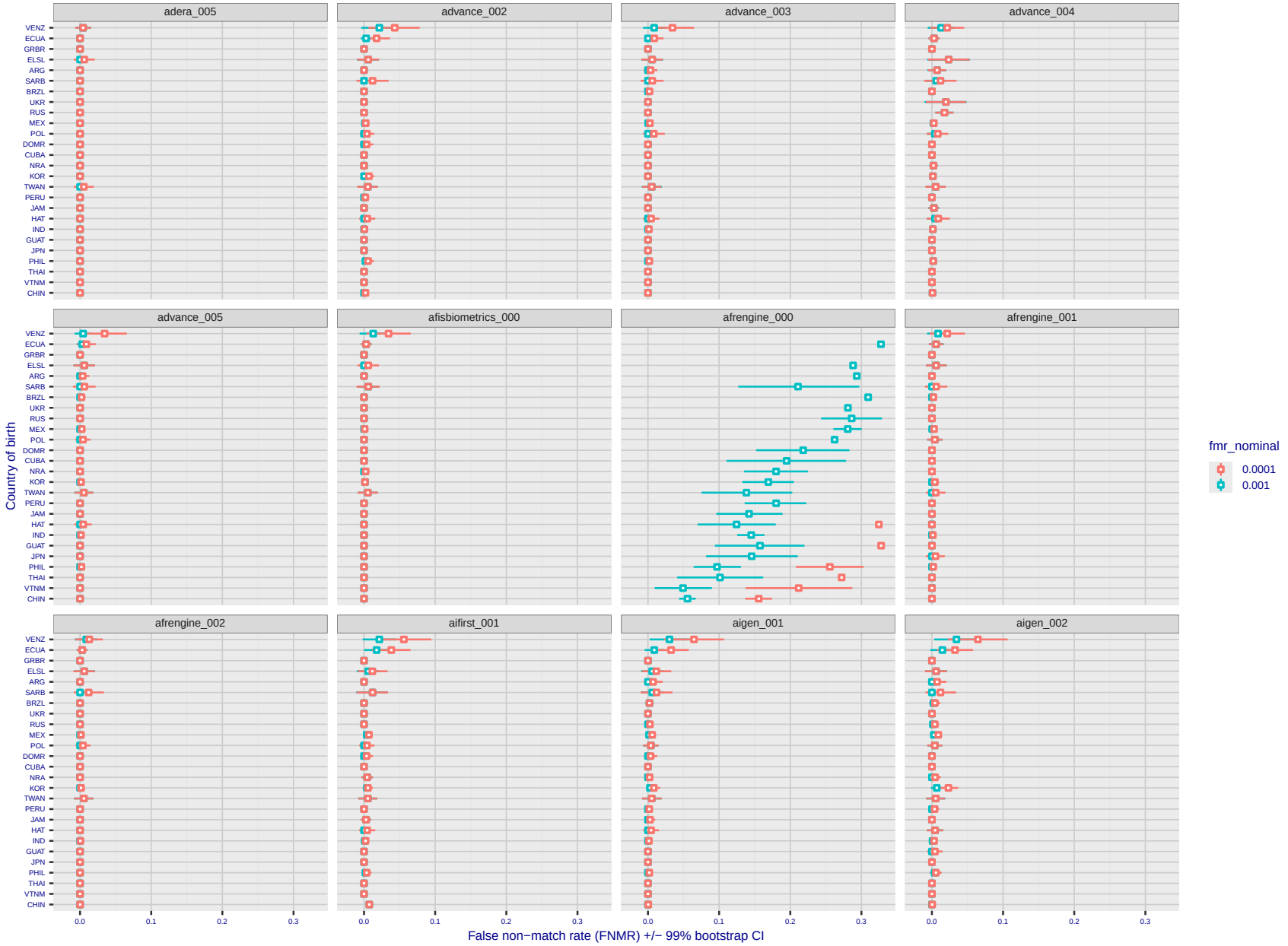

Figure 600: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

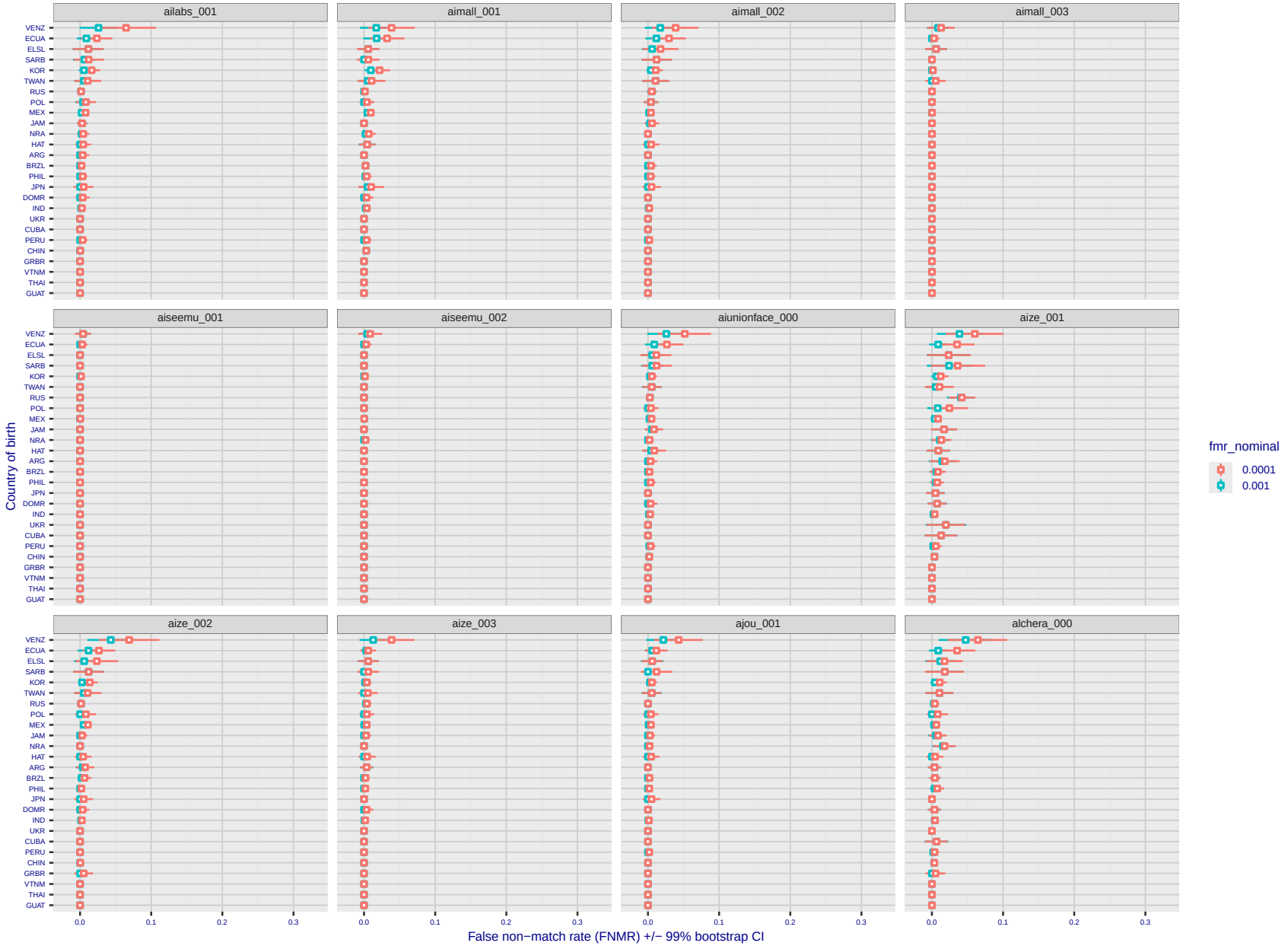

Figure 601: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 602: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

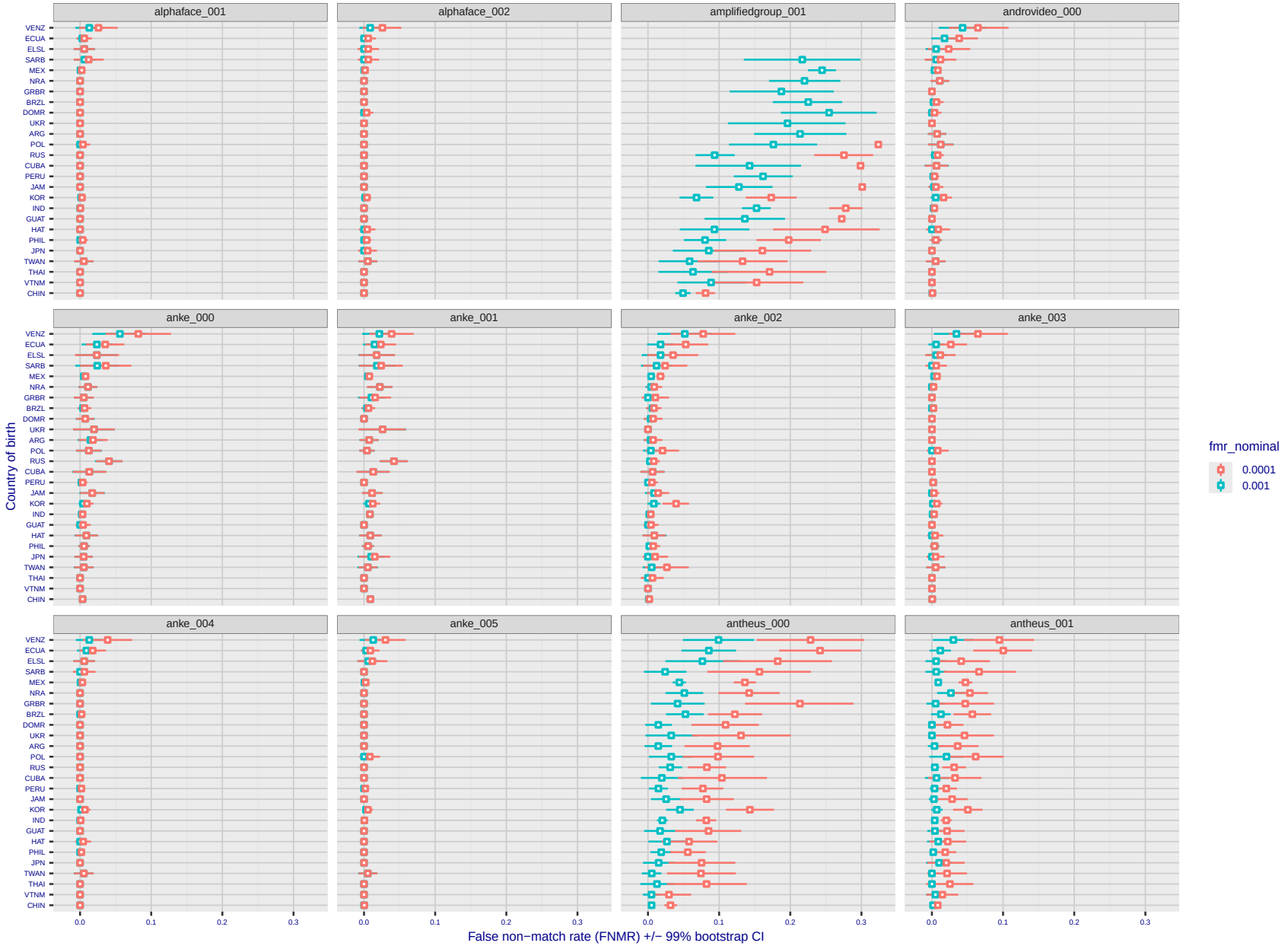

Figure 603: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 604: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 605: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

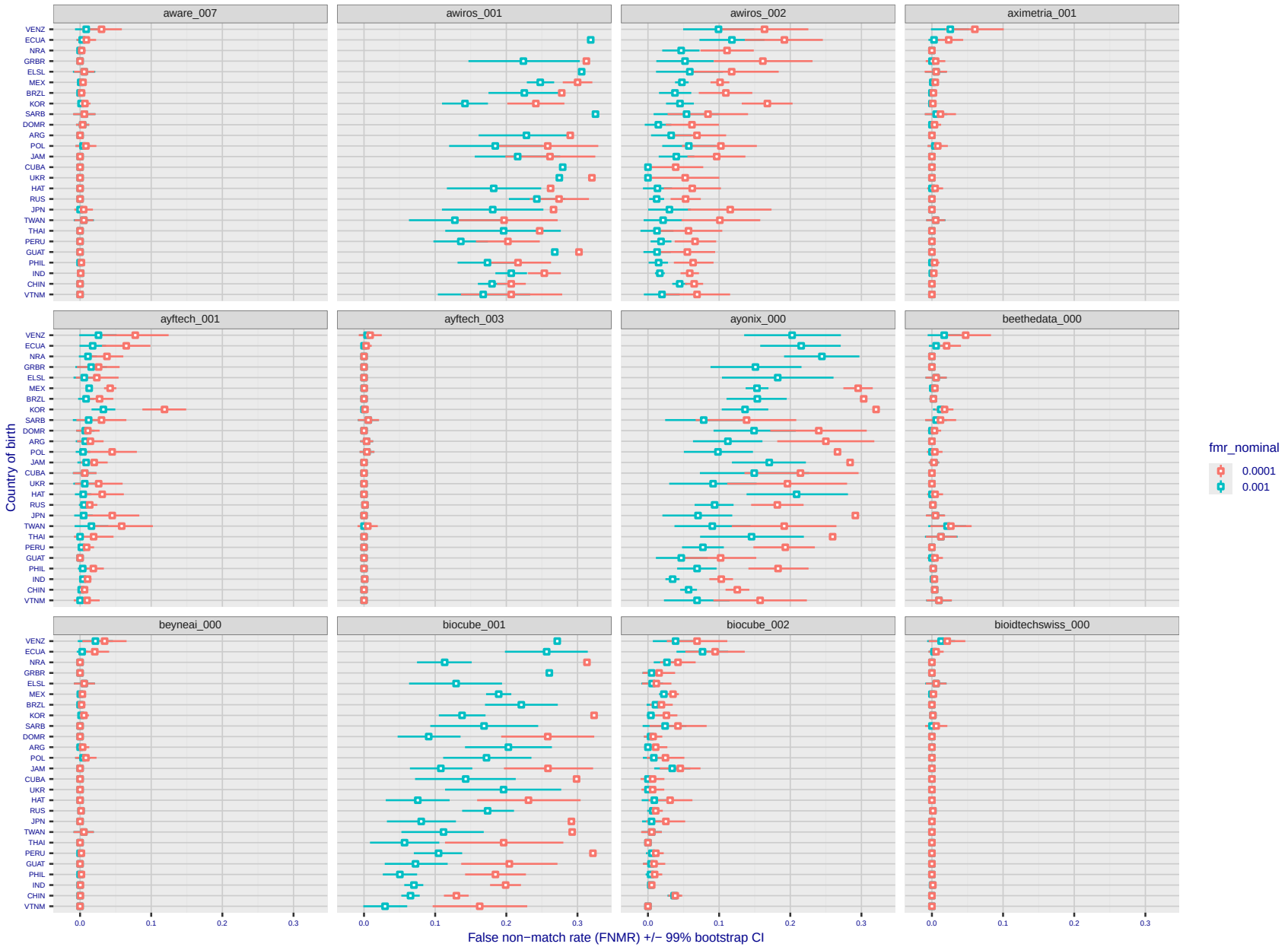

Figure 606: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 607: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 608: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

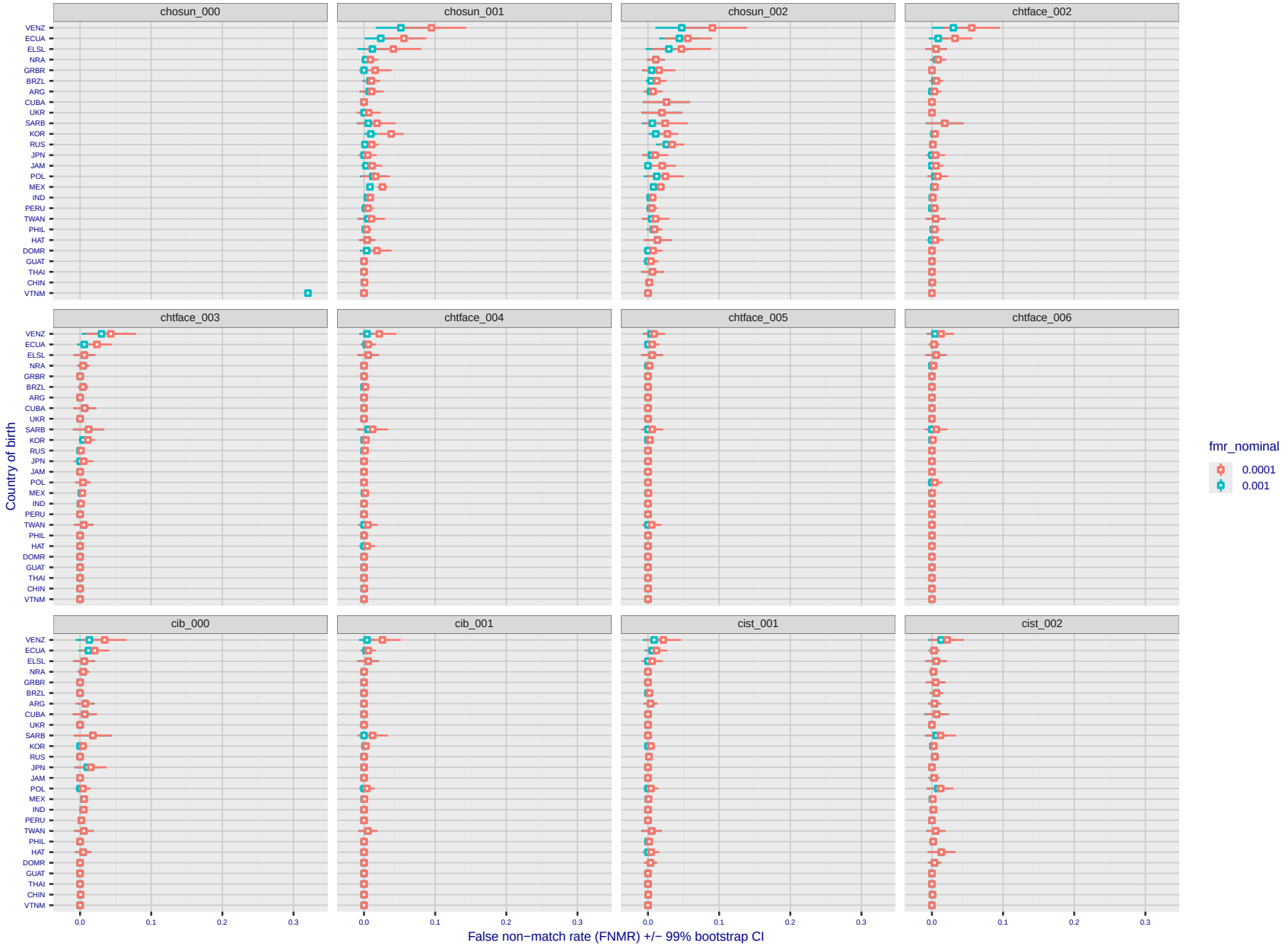

Figure 609: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

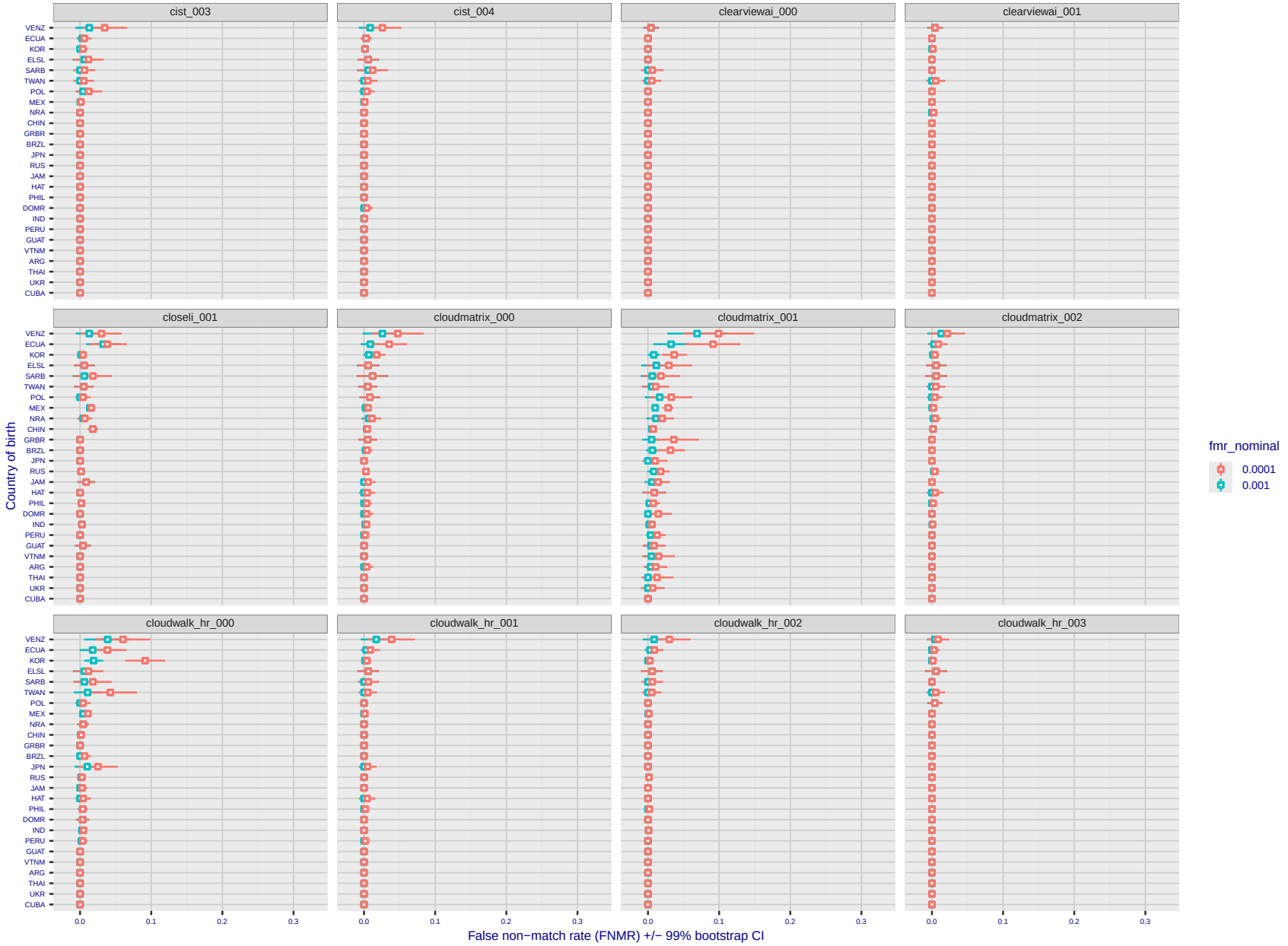

Figure 610: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

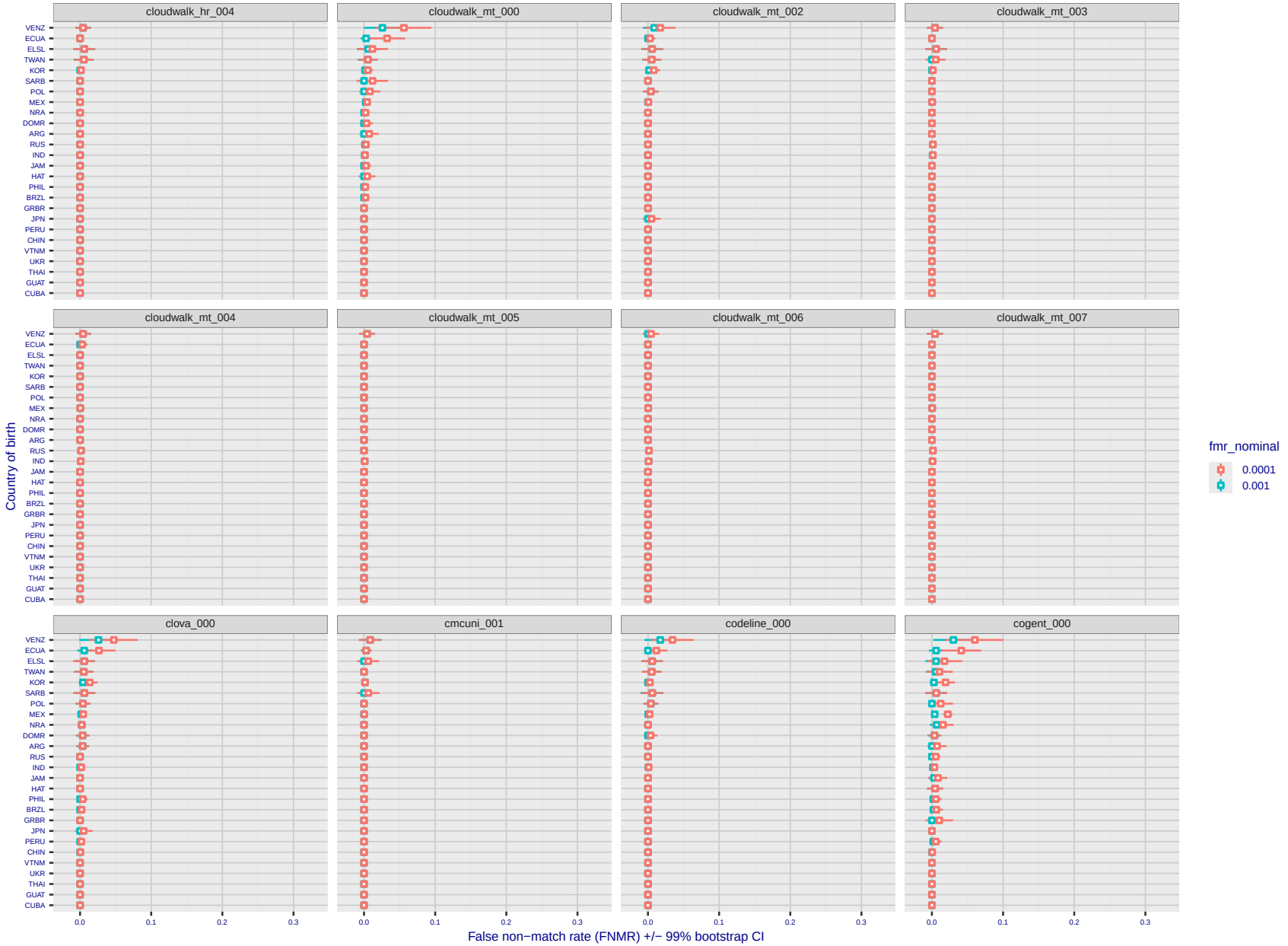

Figure 611: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

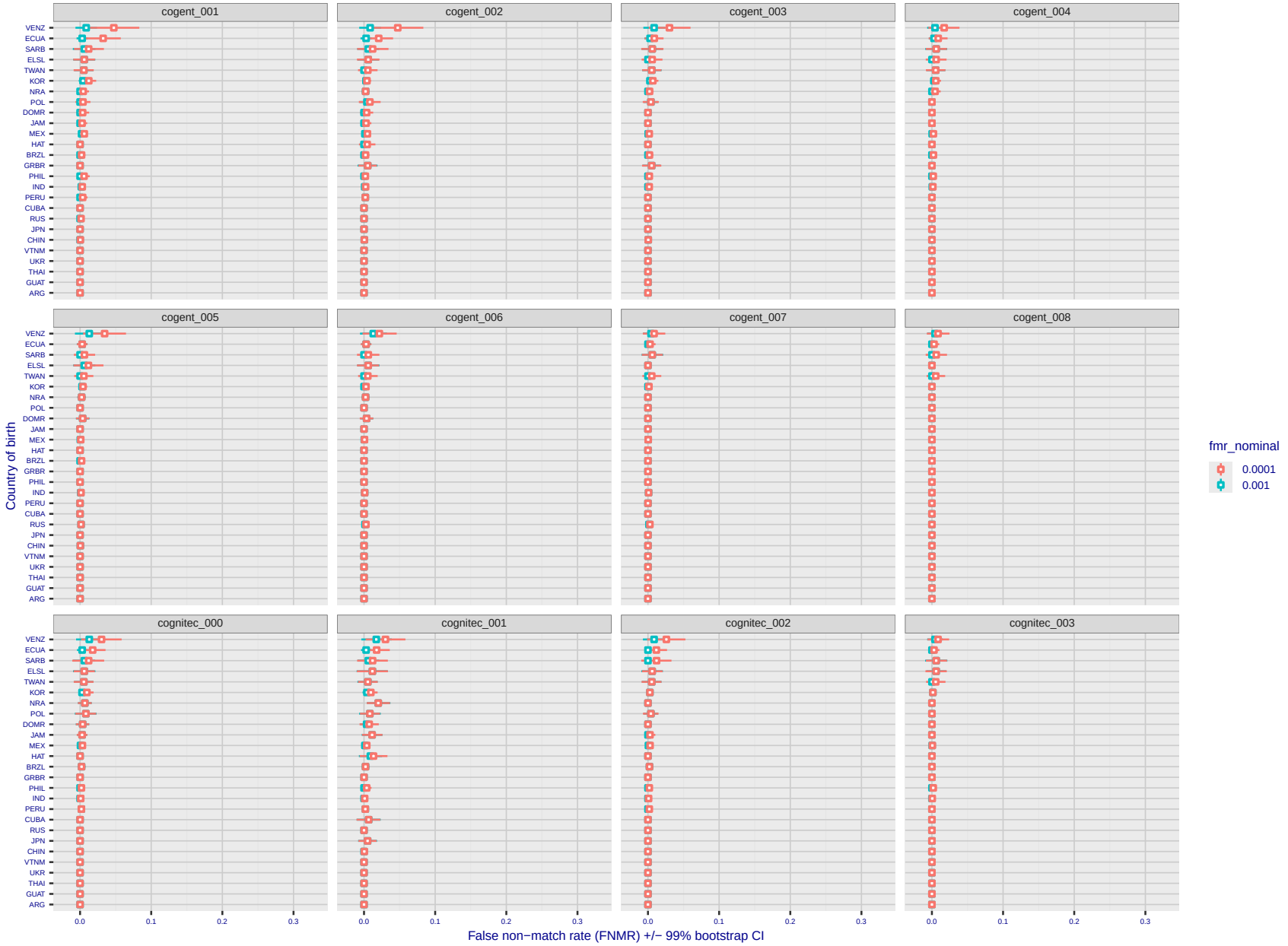

Figure 612: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

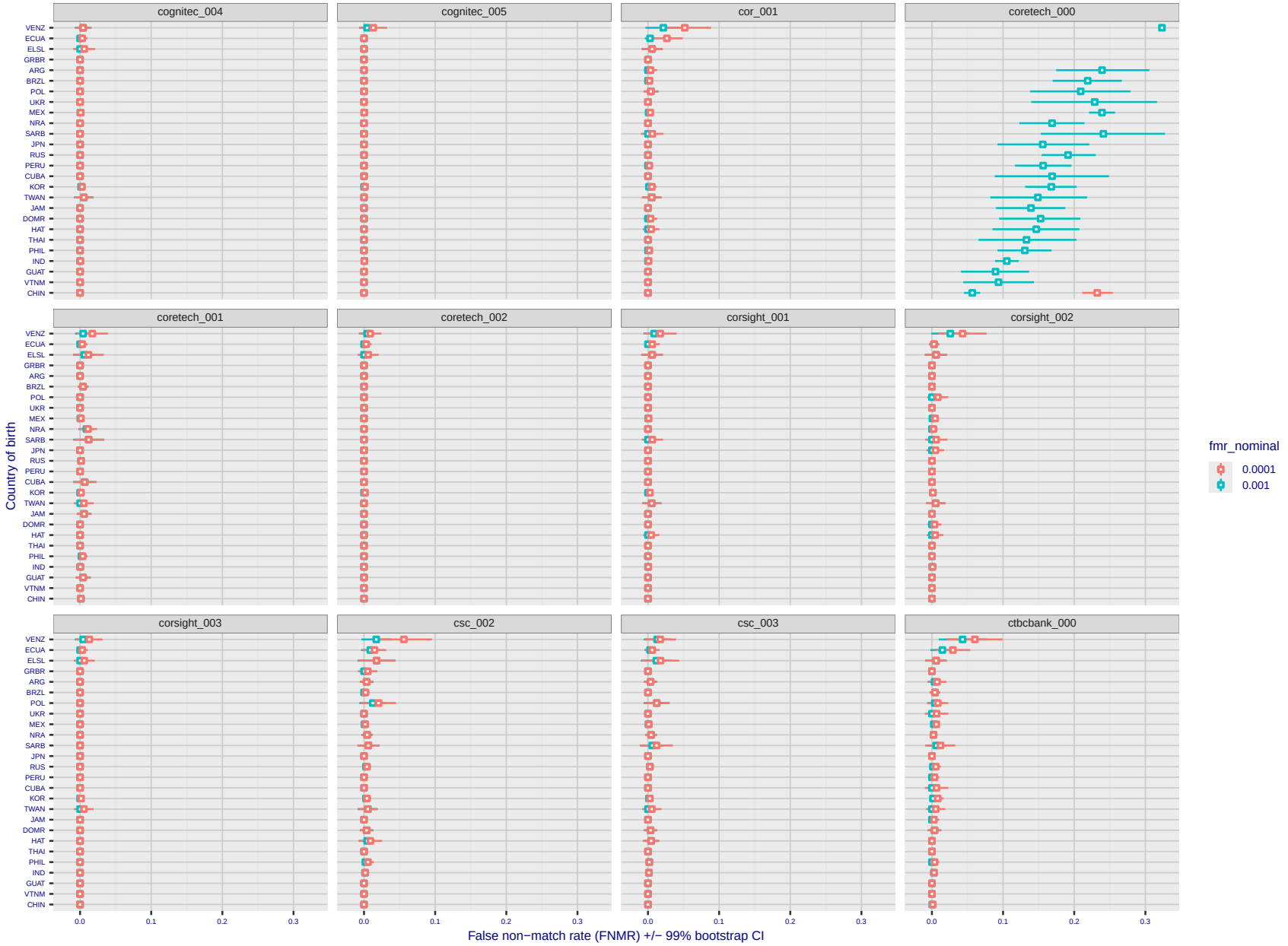

Figure 613: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

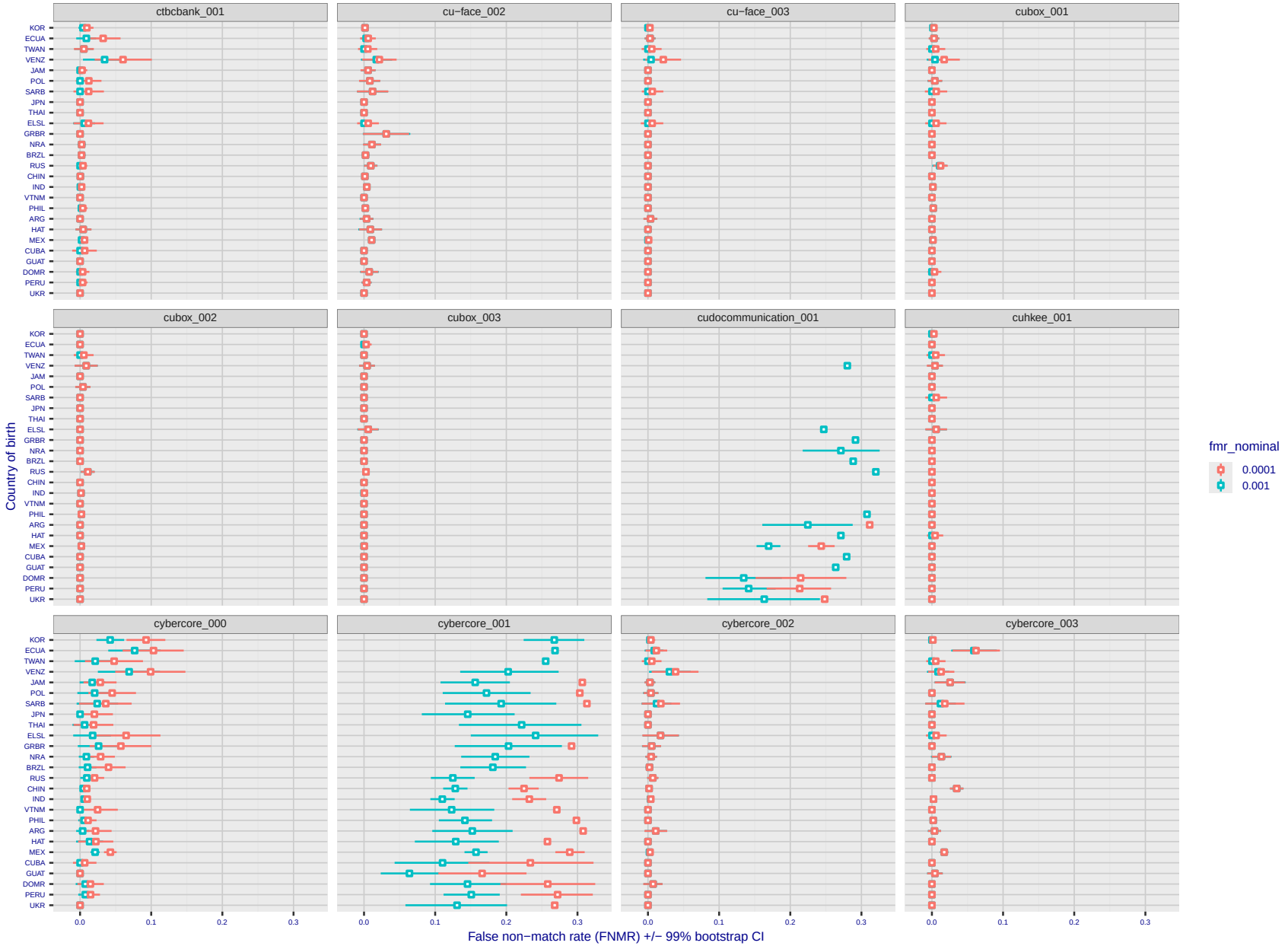

Figure 614: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 615: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

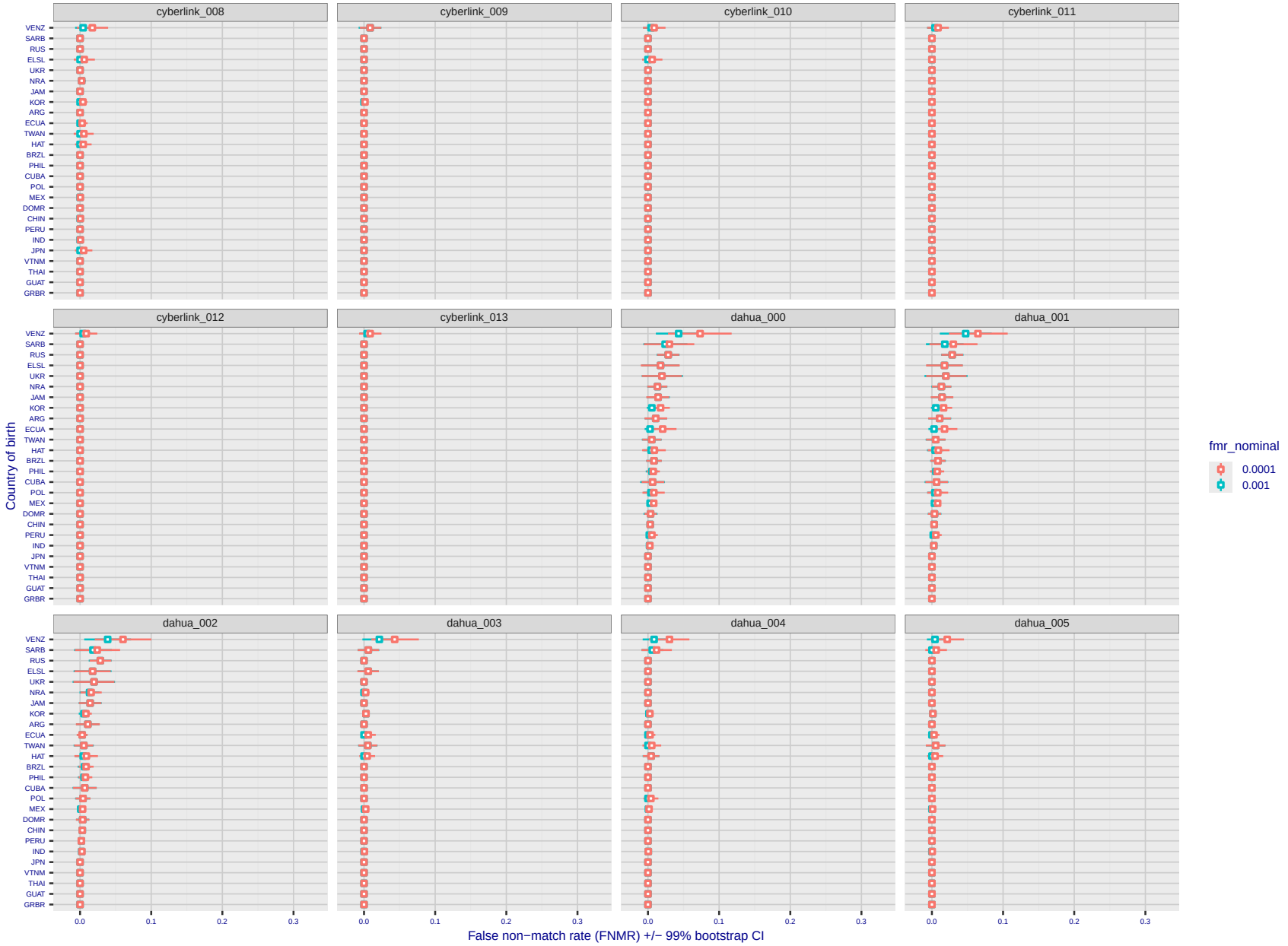

Figure 616: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 617: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

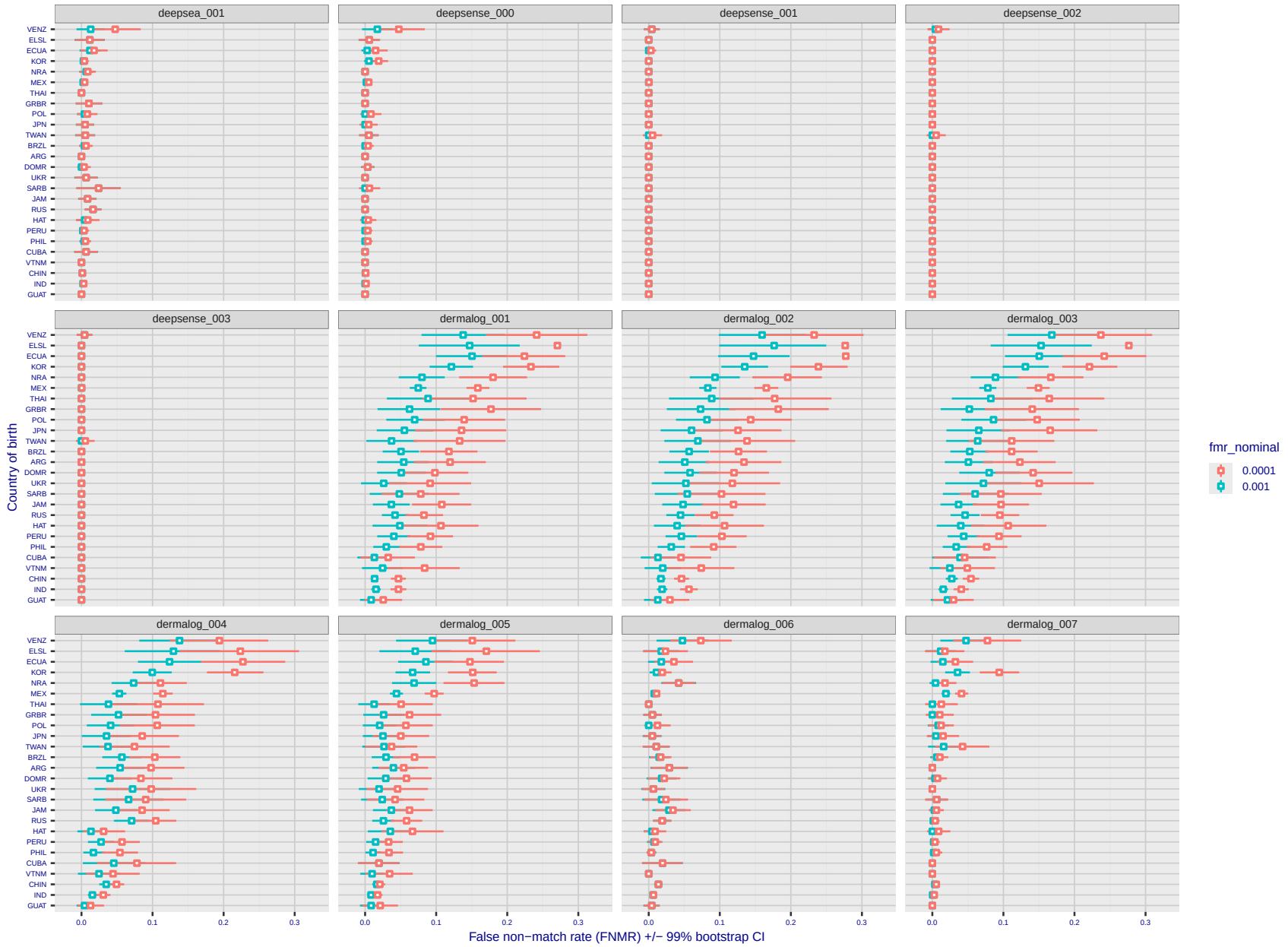

Figure 618: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

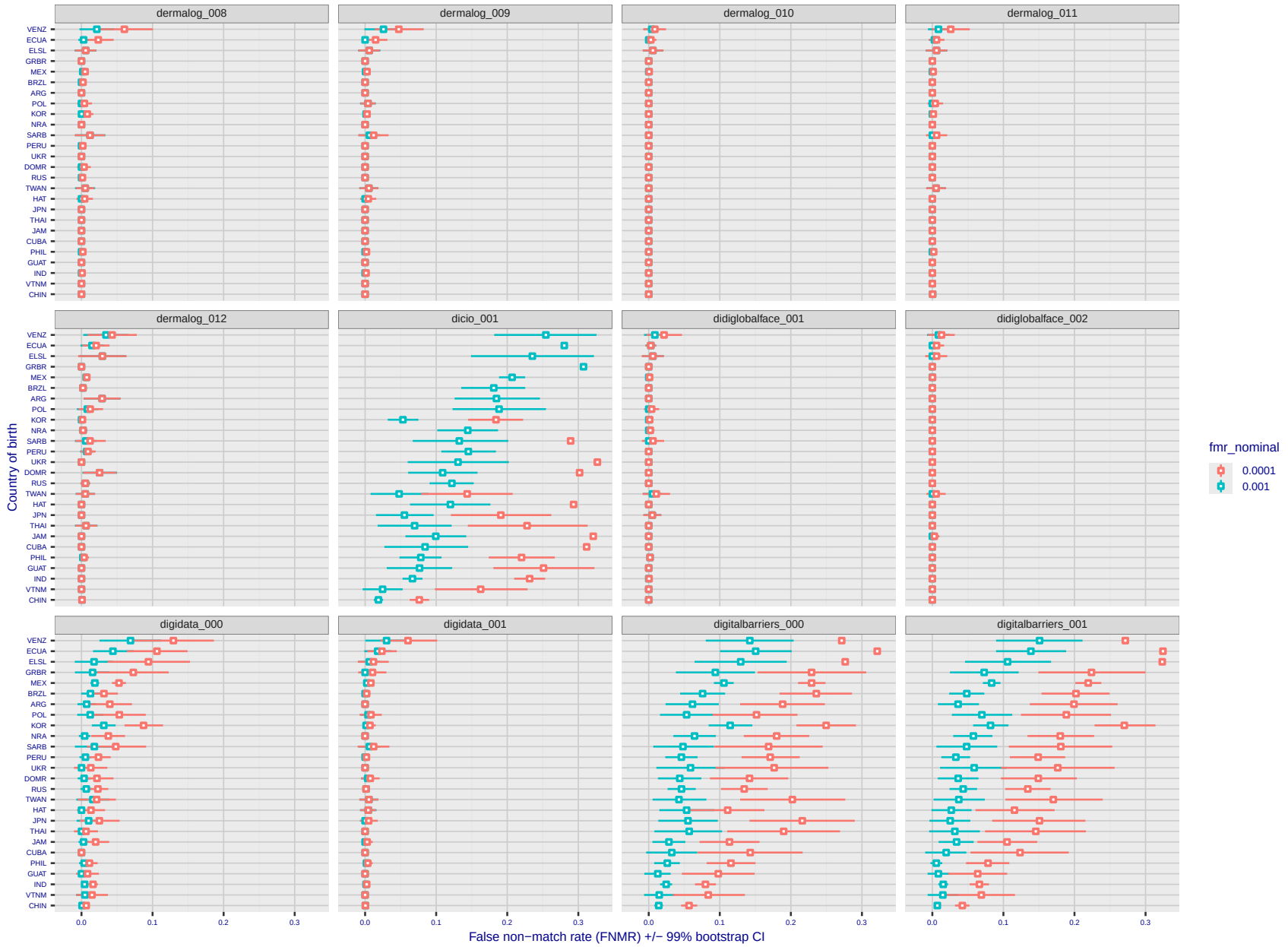

Figure 619: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 620: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 621: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 622: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

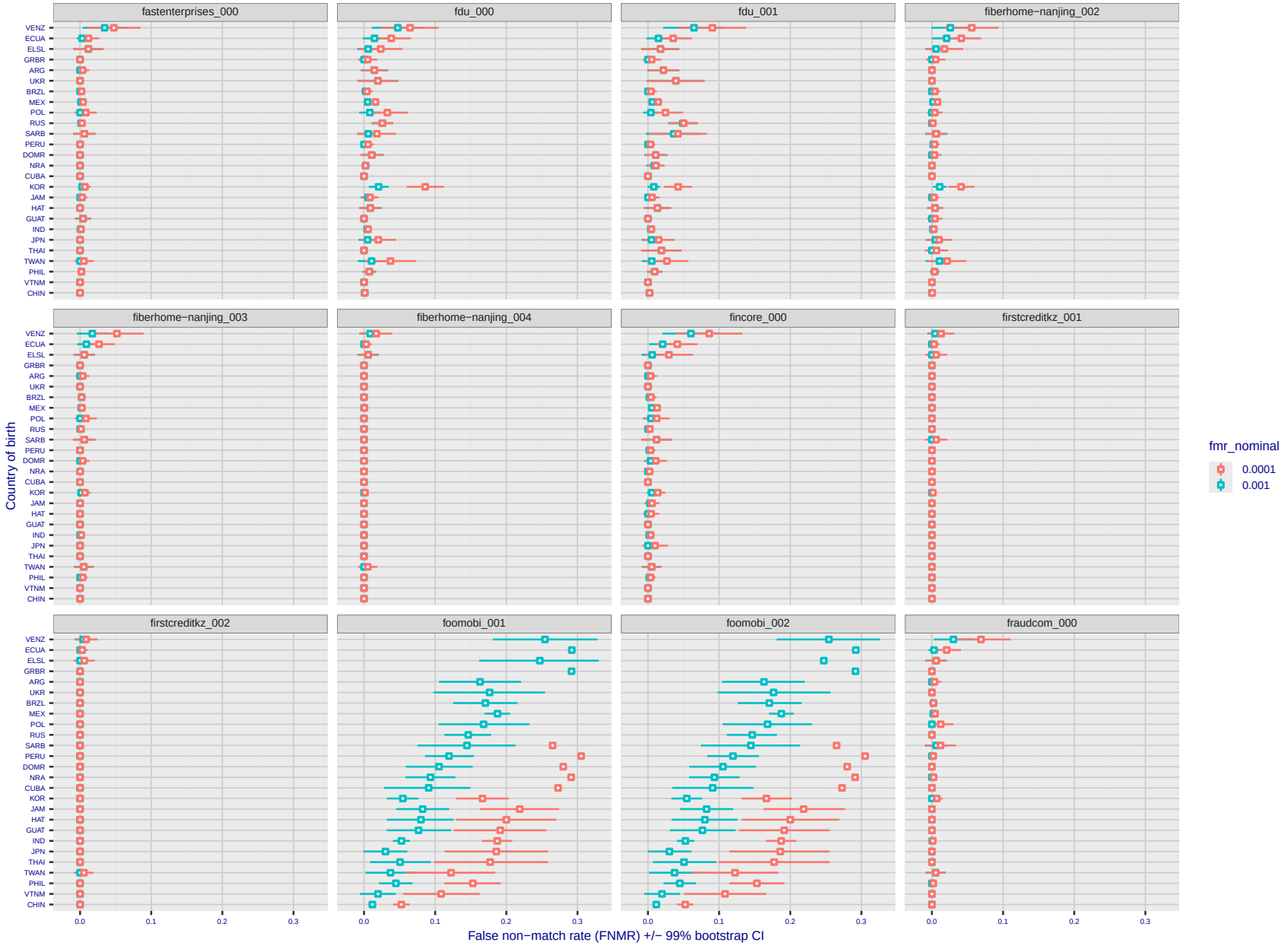

Figure 623: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

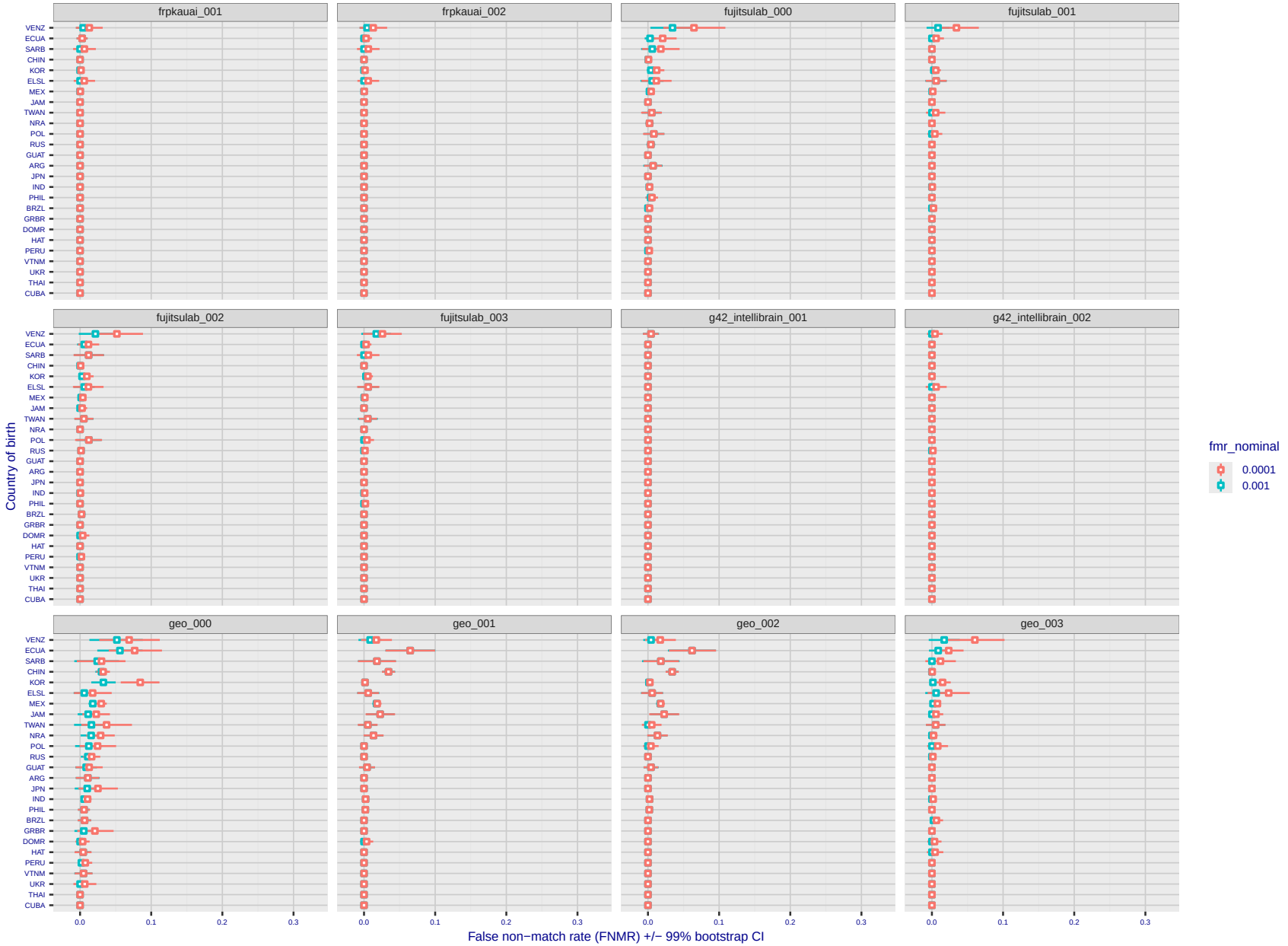

Figure 624: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 625: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

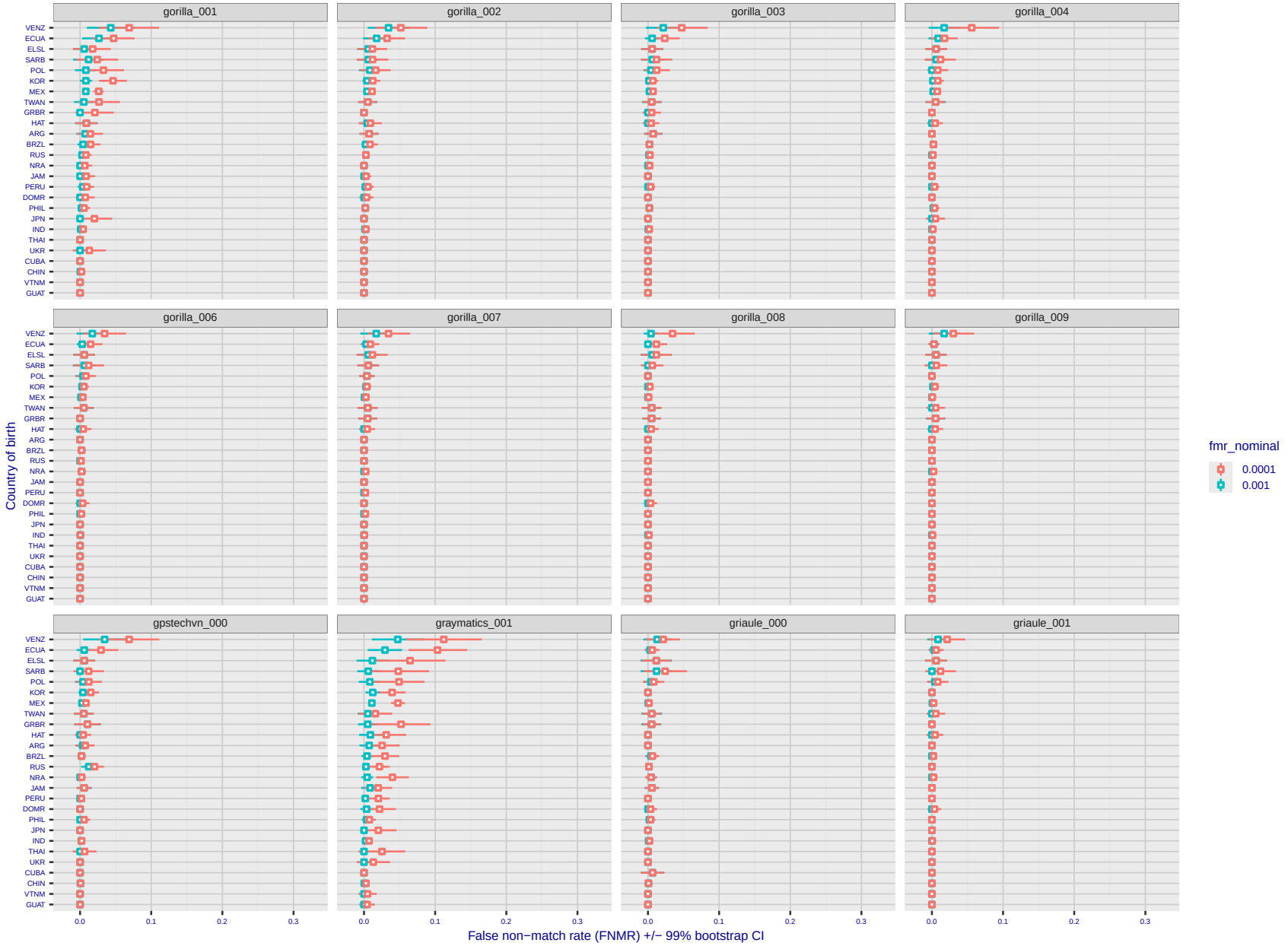

Figure 626: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 627: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 628: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

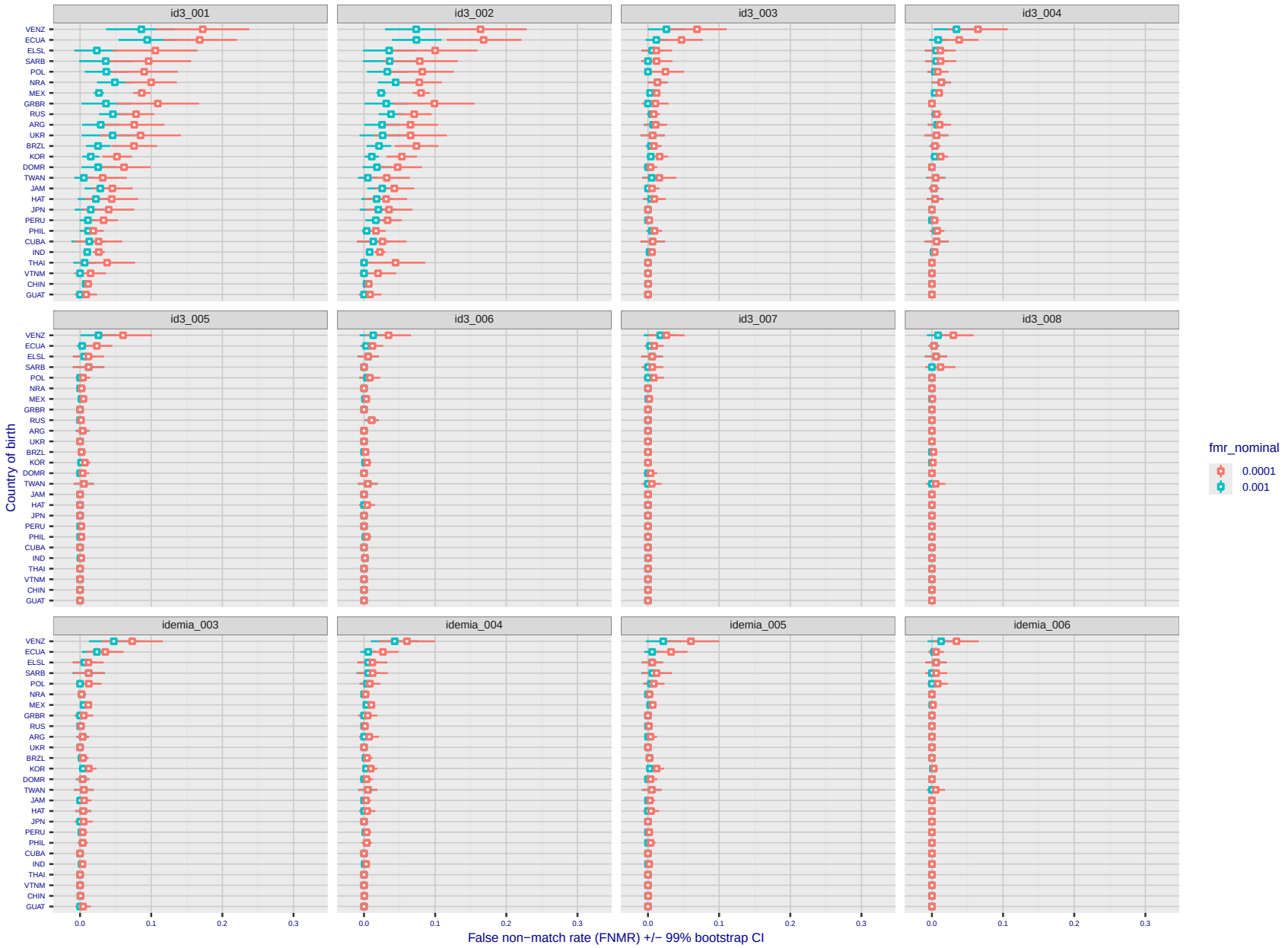

Figure 629: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

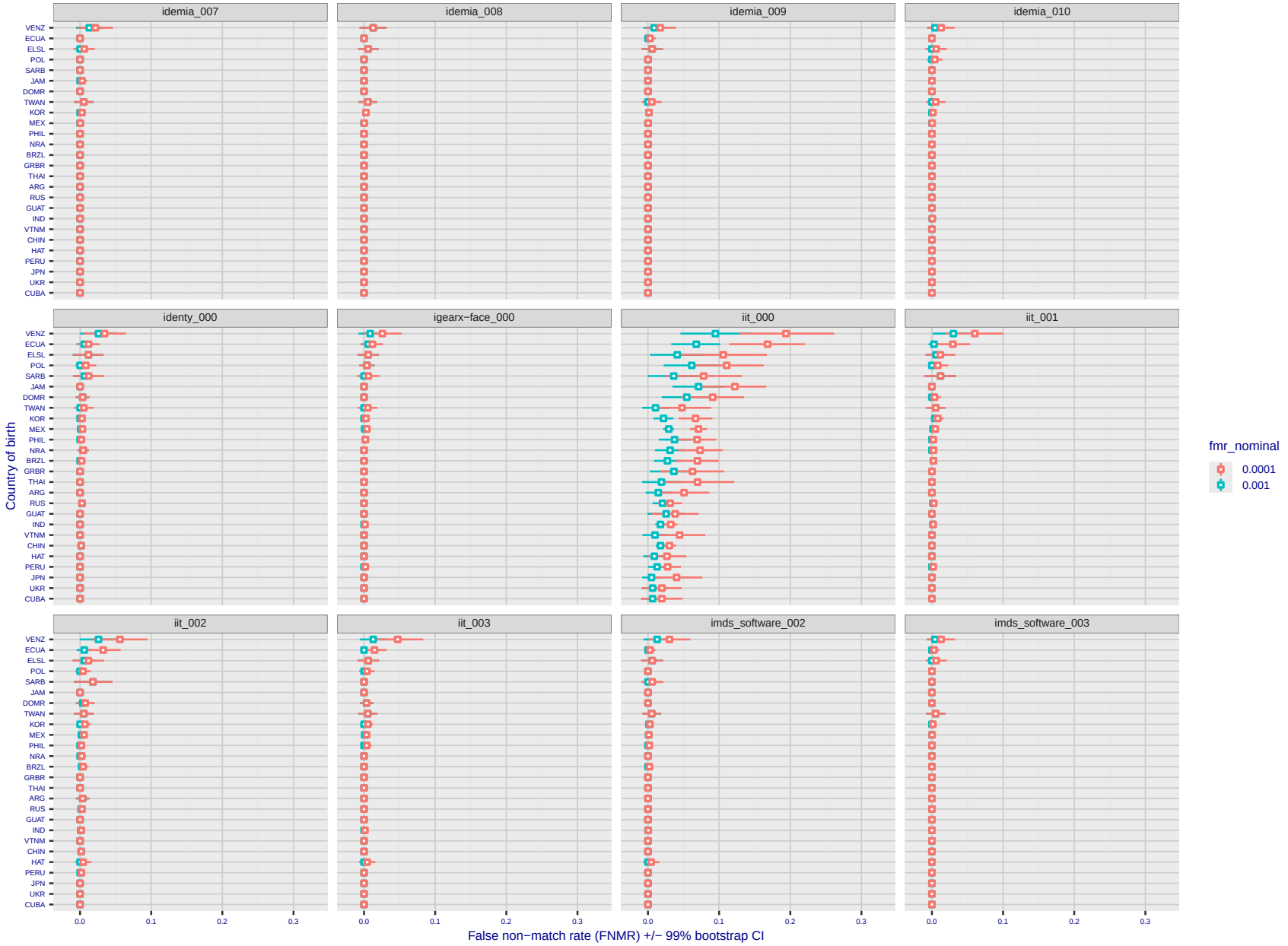

Figure 630: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

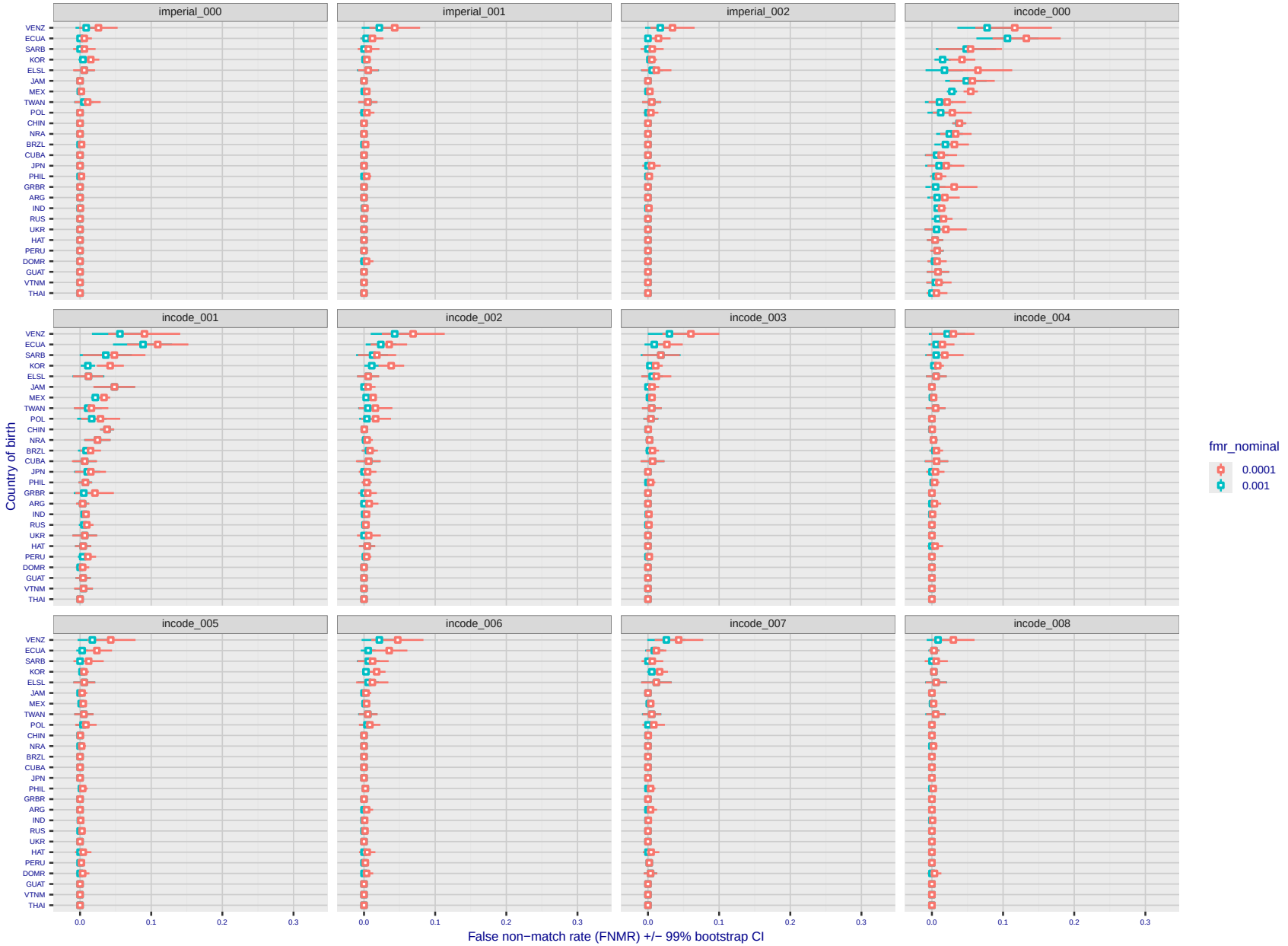

Figure 631: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

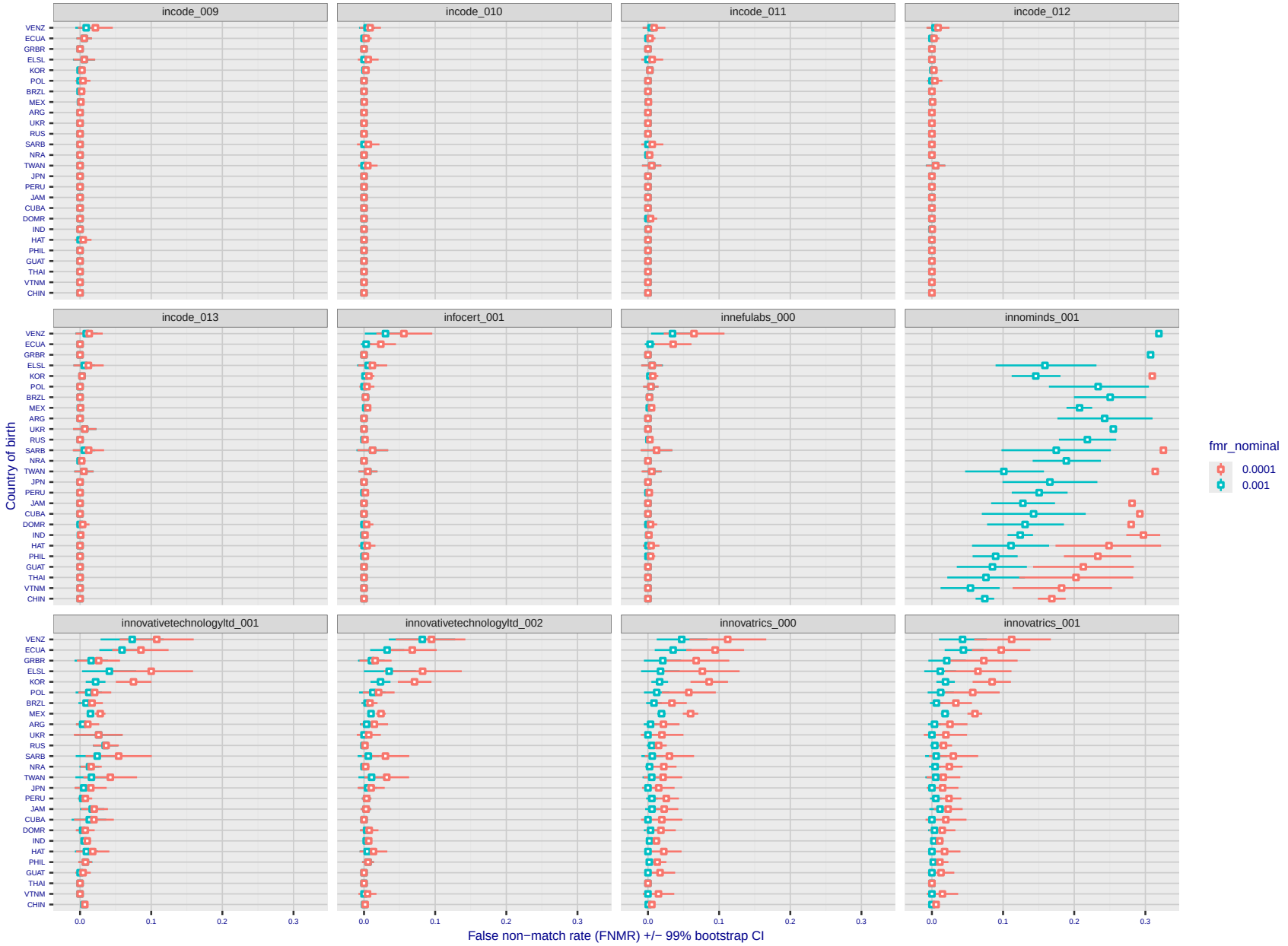

Figure 632: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

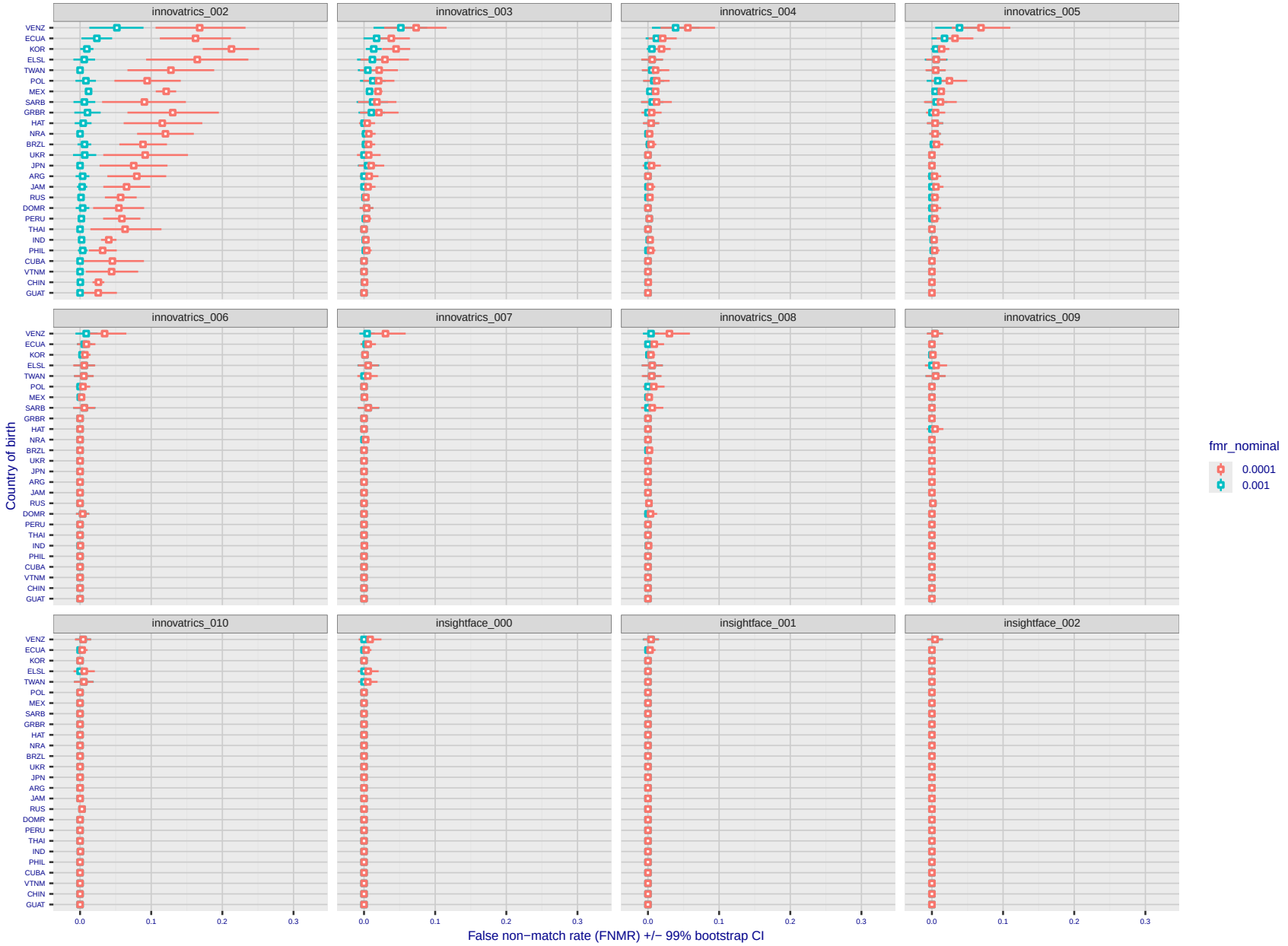

Figure 633: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

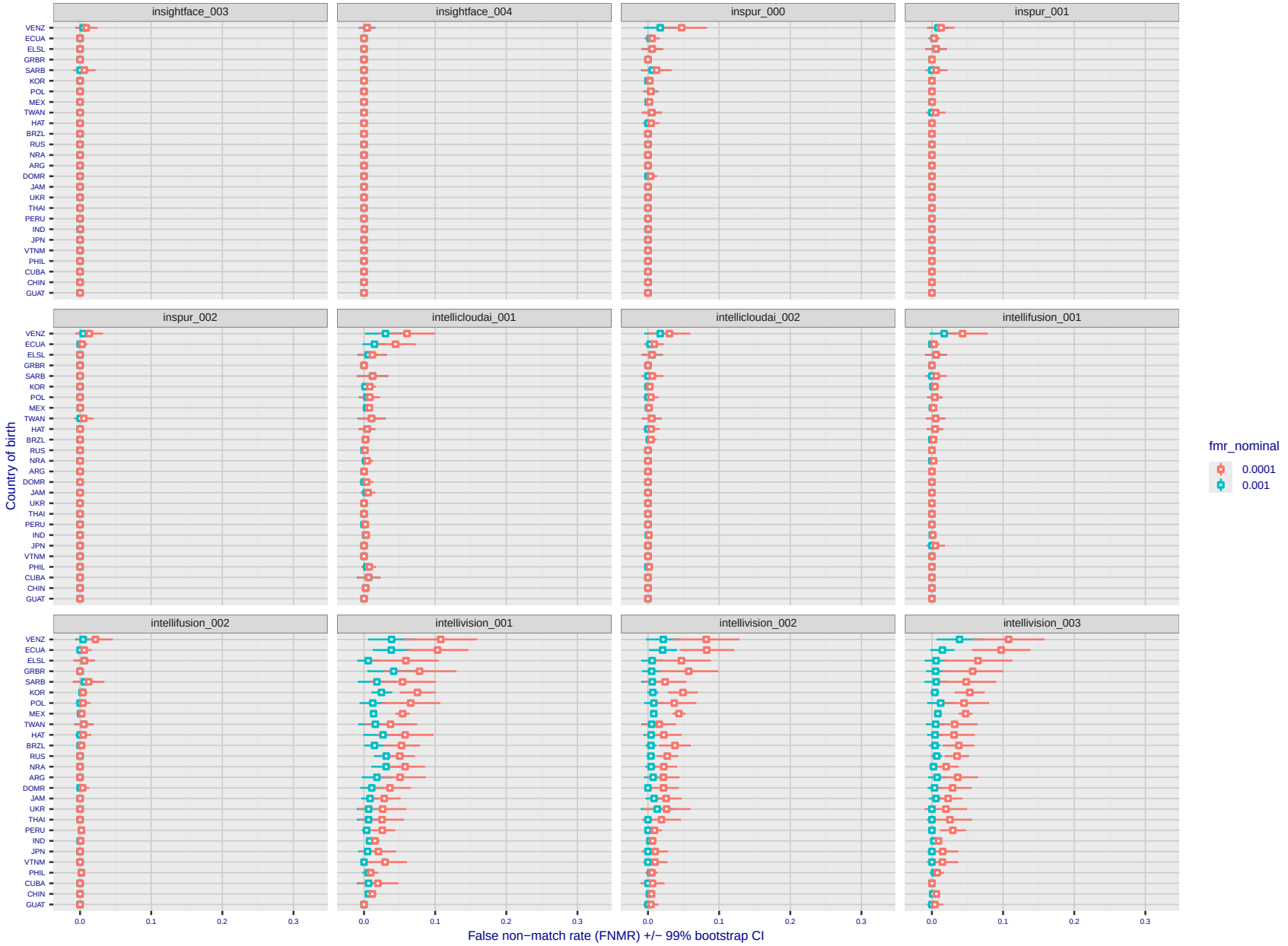

Figure 634: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

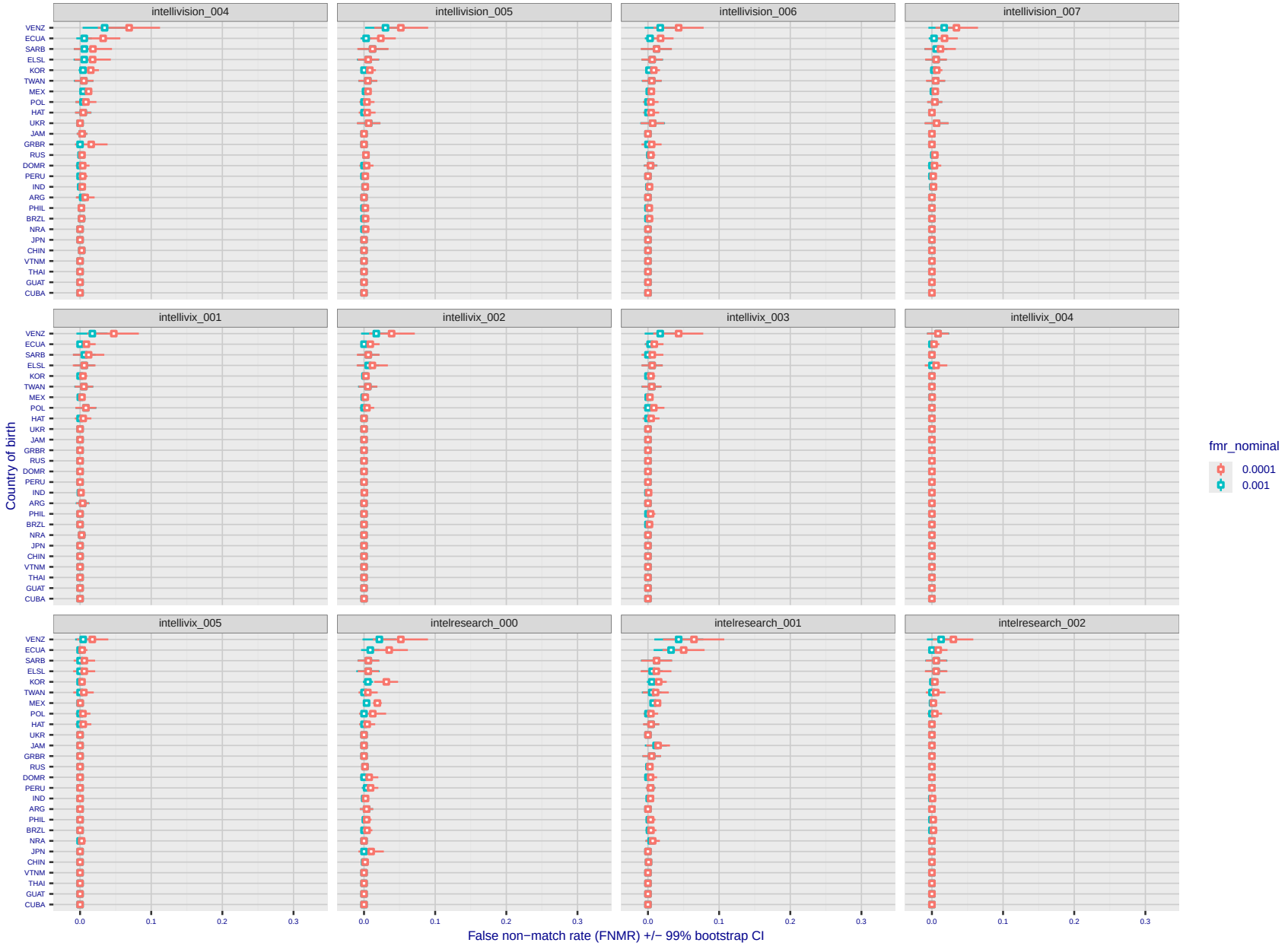

Figure 635: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 636: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

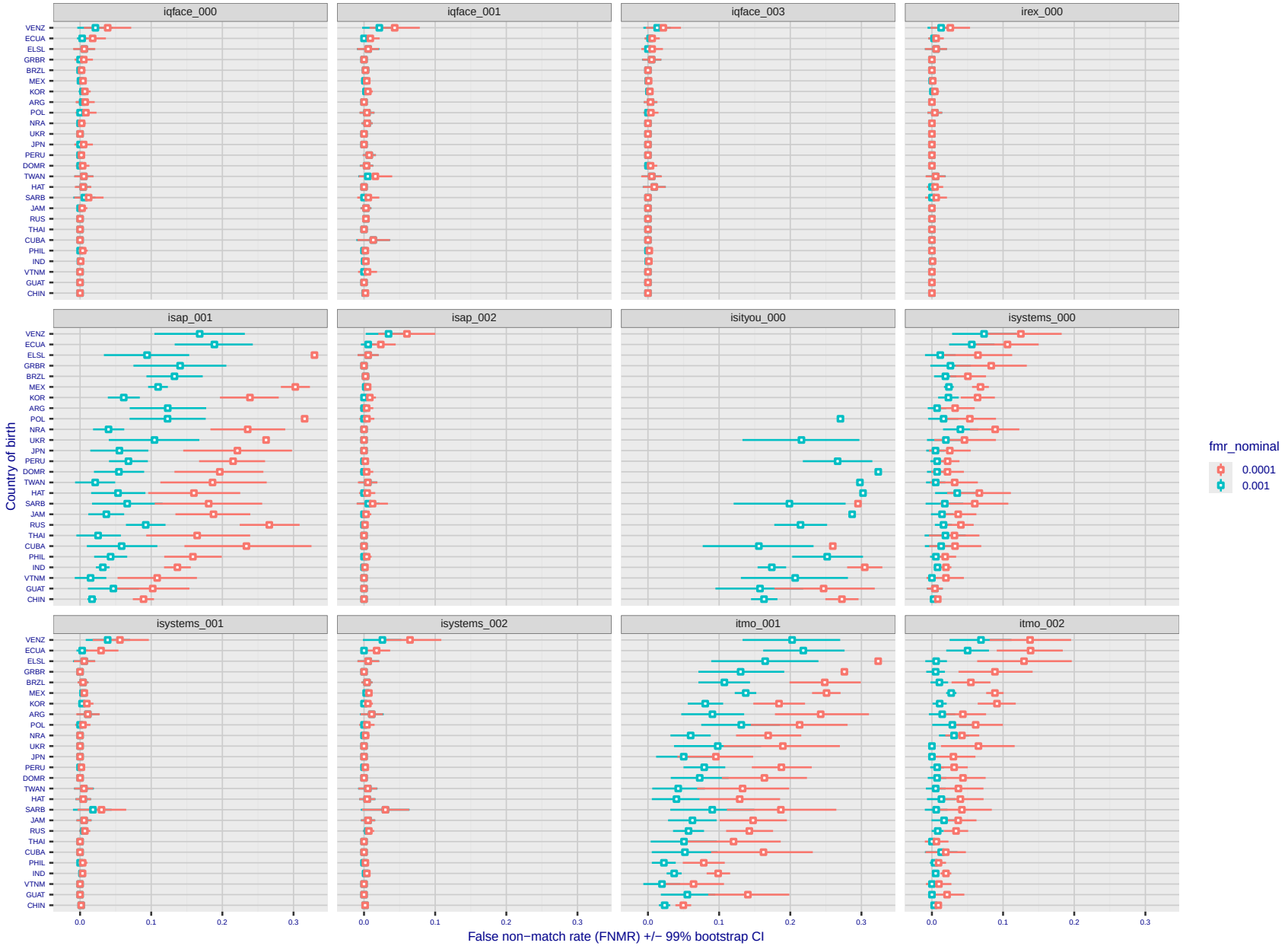

Figure 637: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

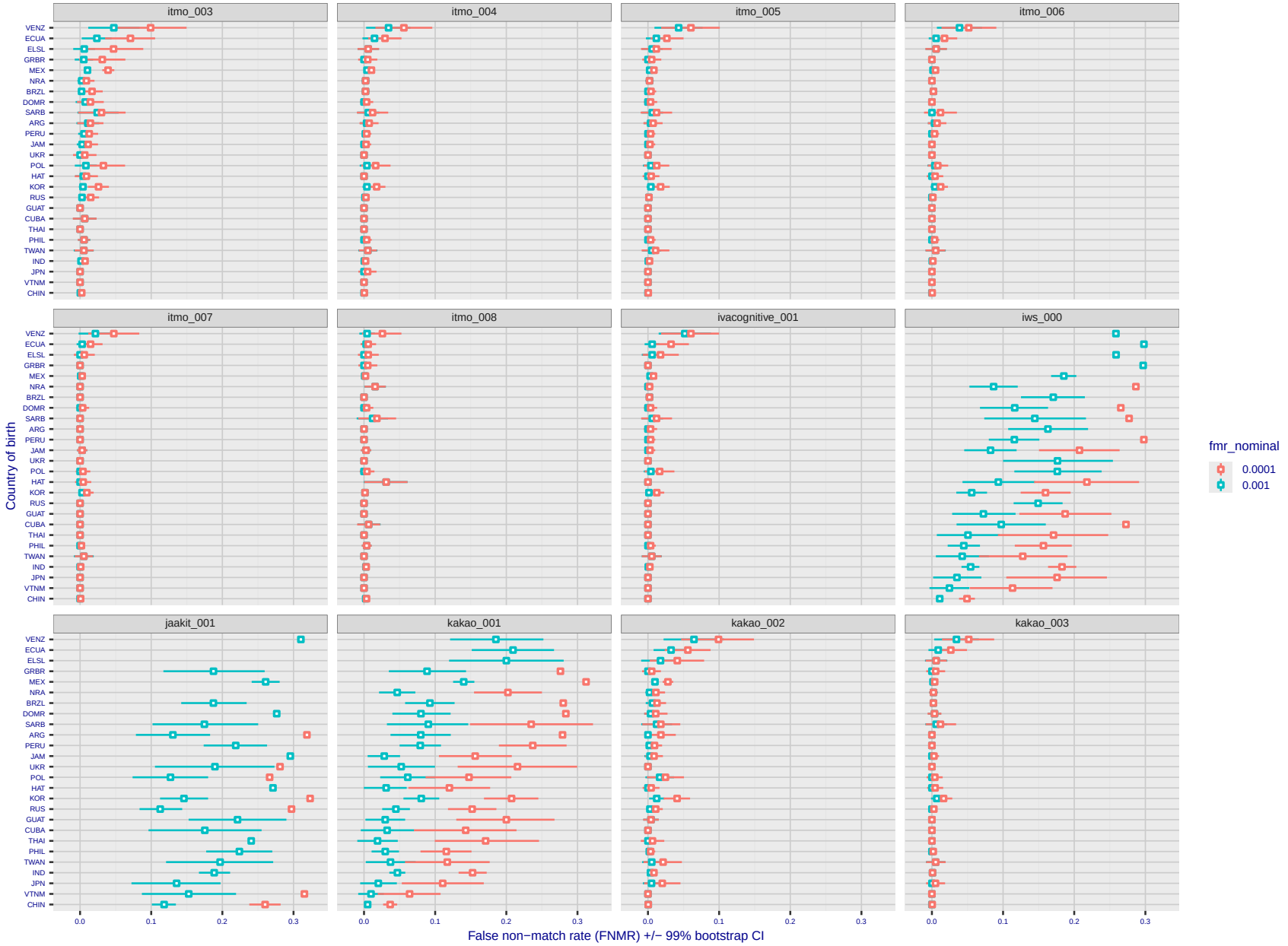

Figure 638: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

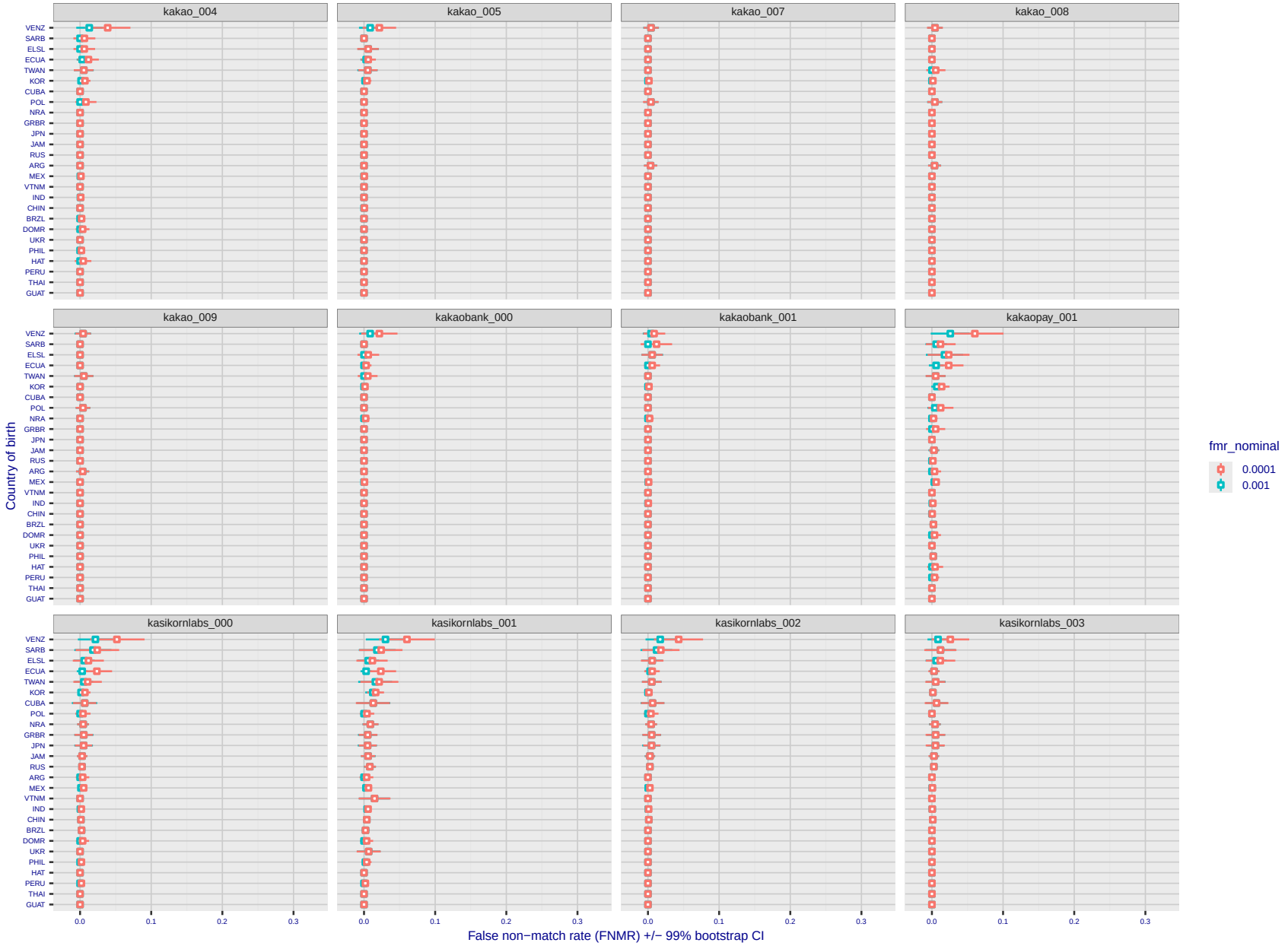

Figure 639: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

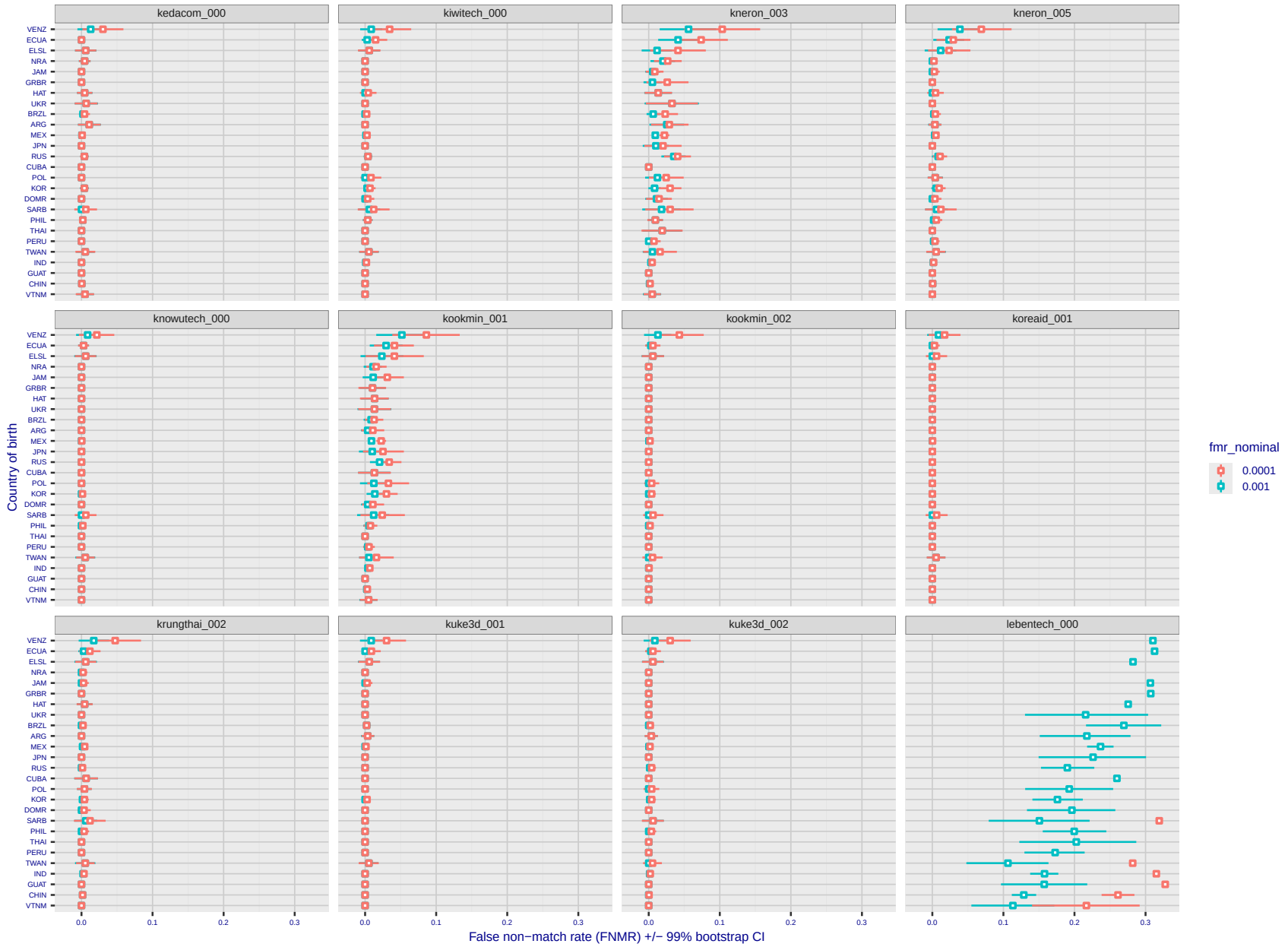

Figure 640: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

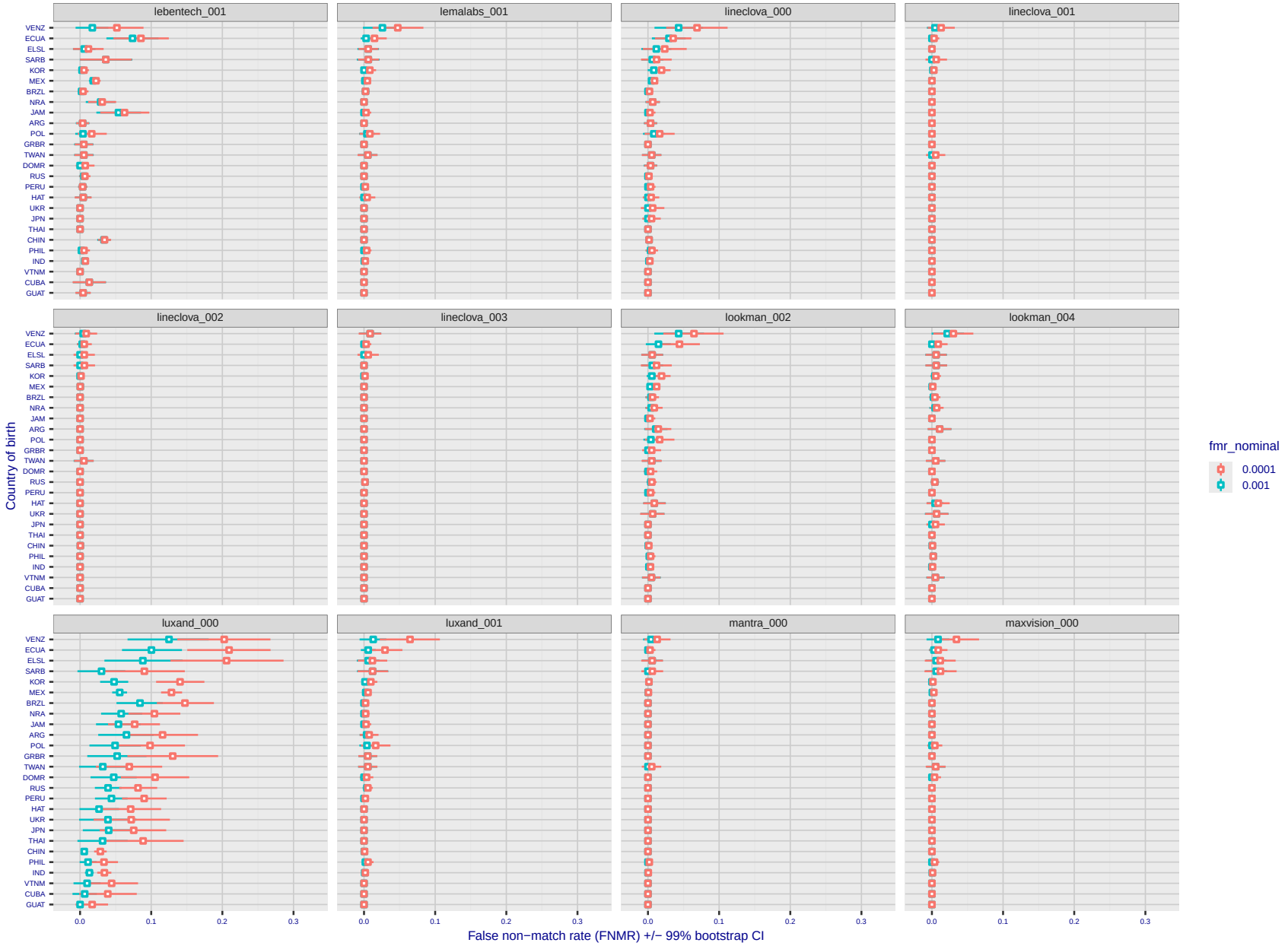

Figure 641: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

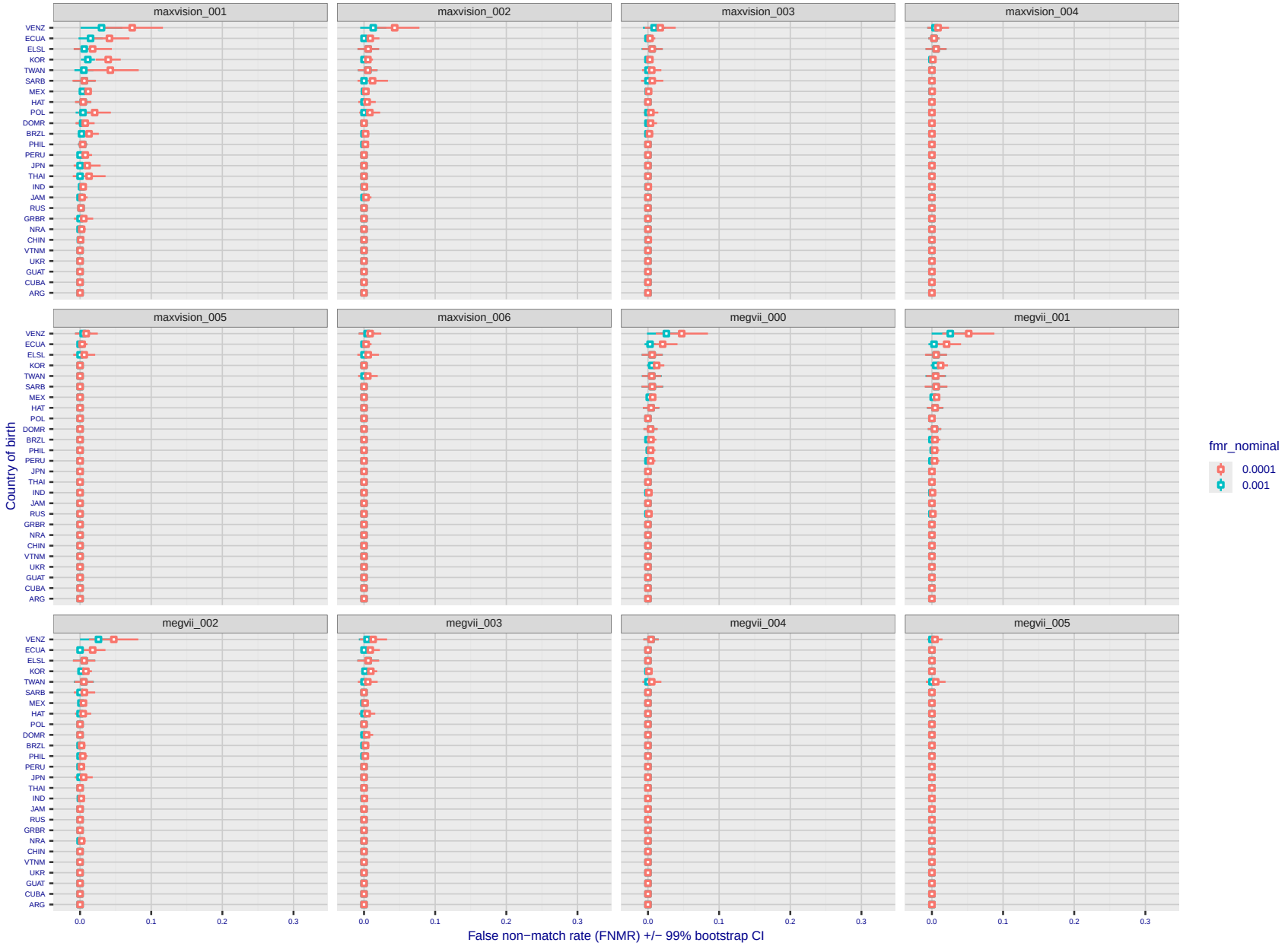

Figure 642: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 643: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 644: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 645: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

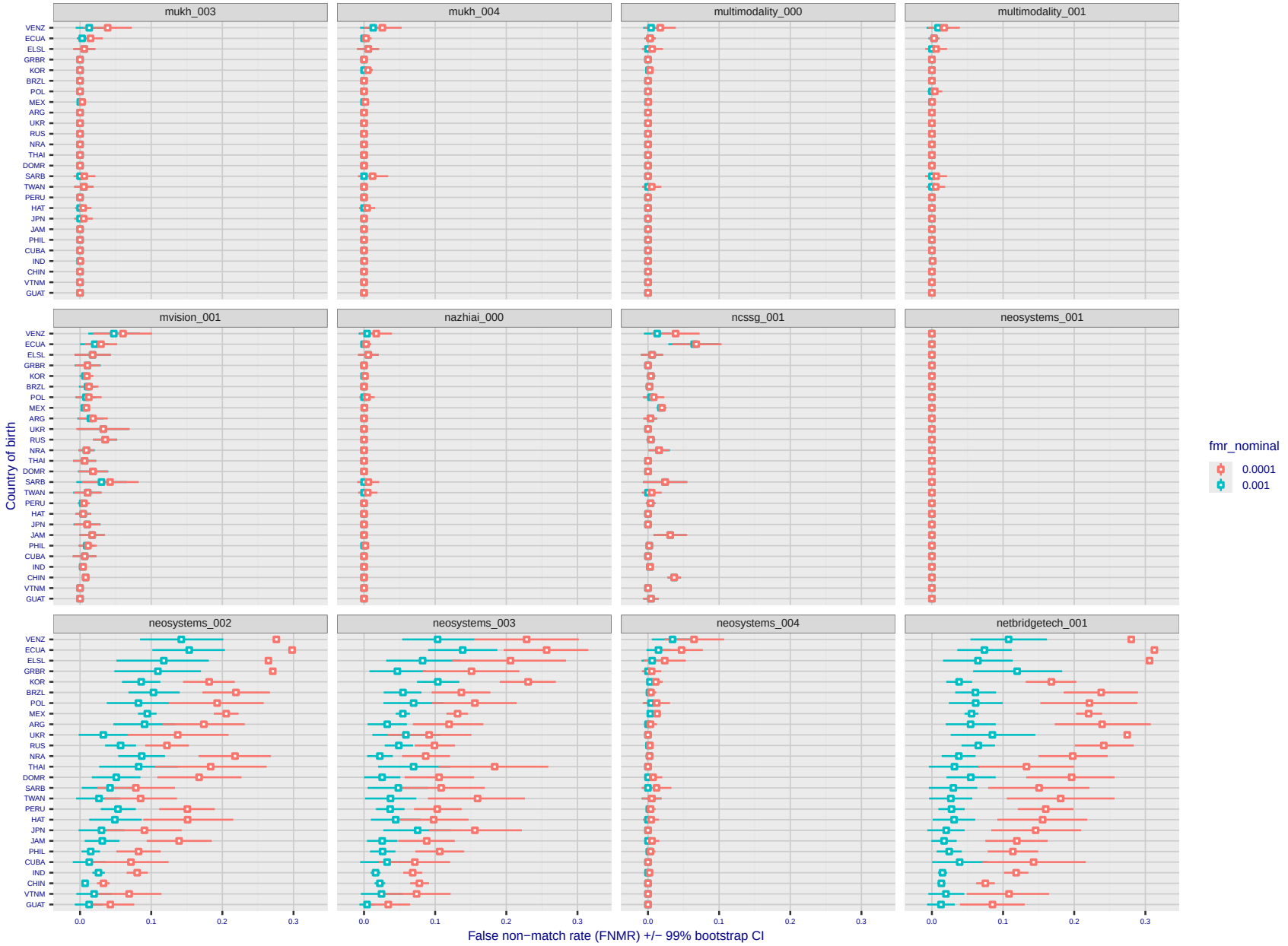

Figure 646: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

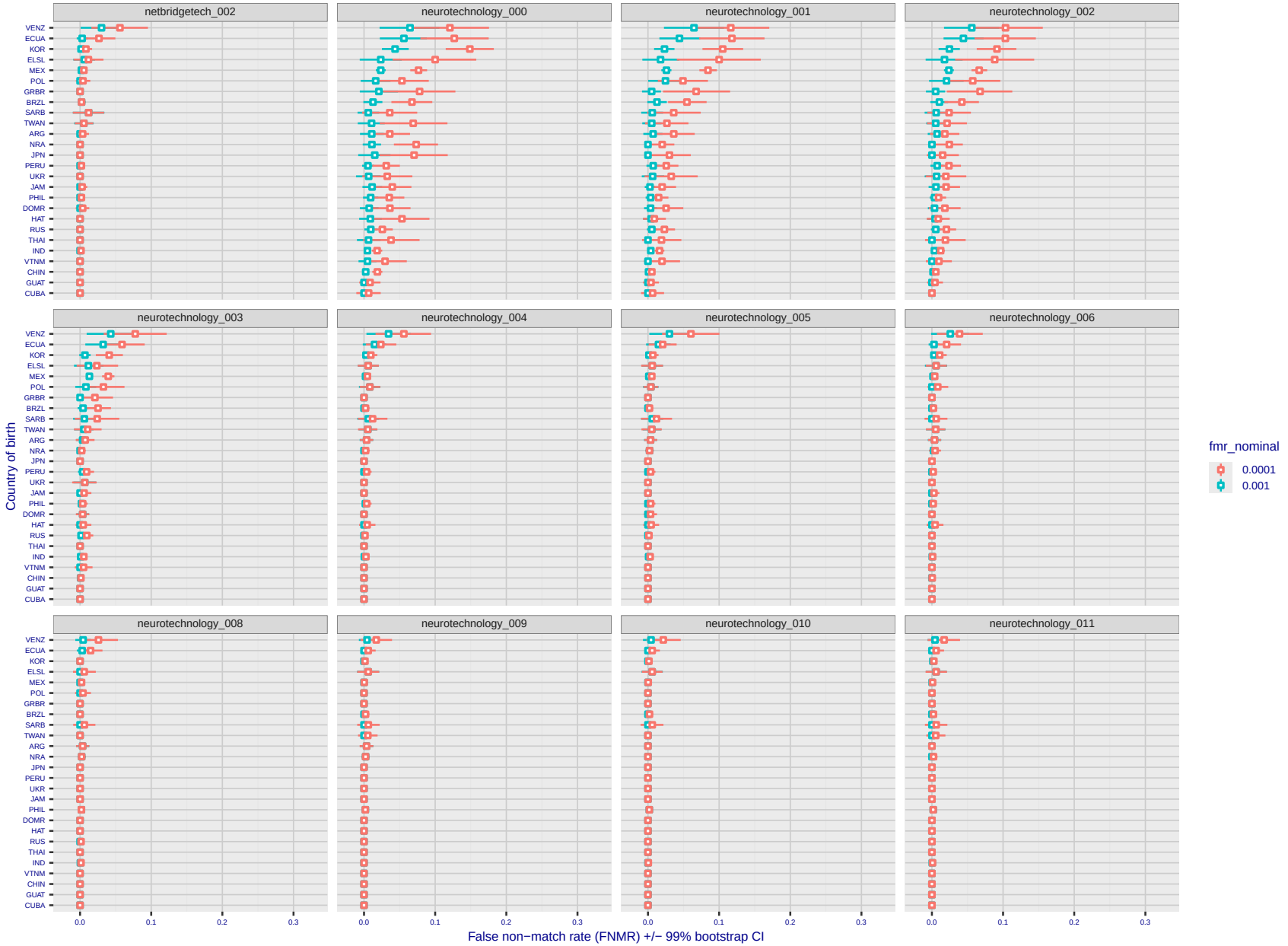

Figure 647: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

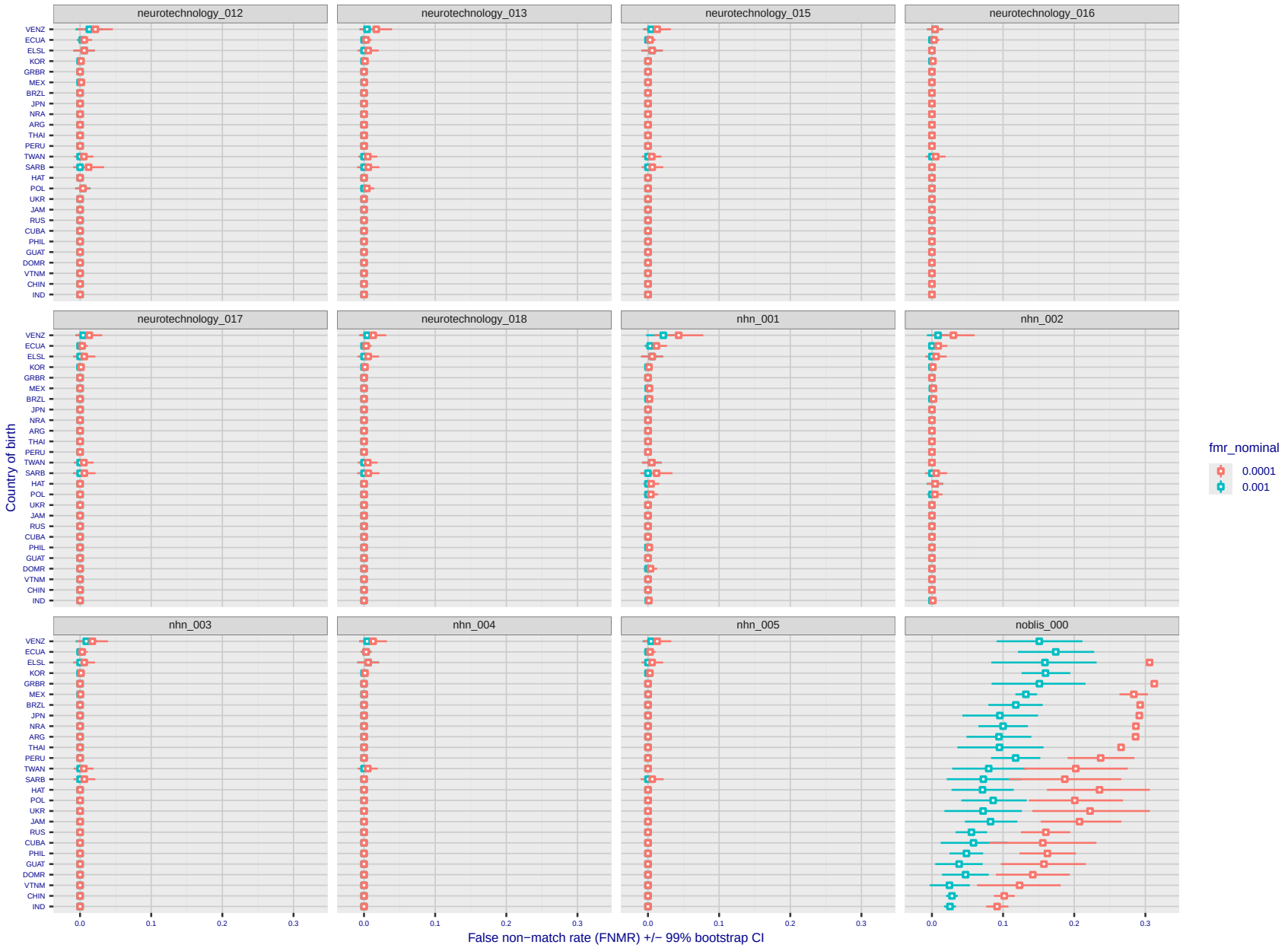

Figure 648: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 649: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

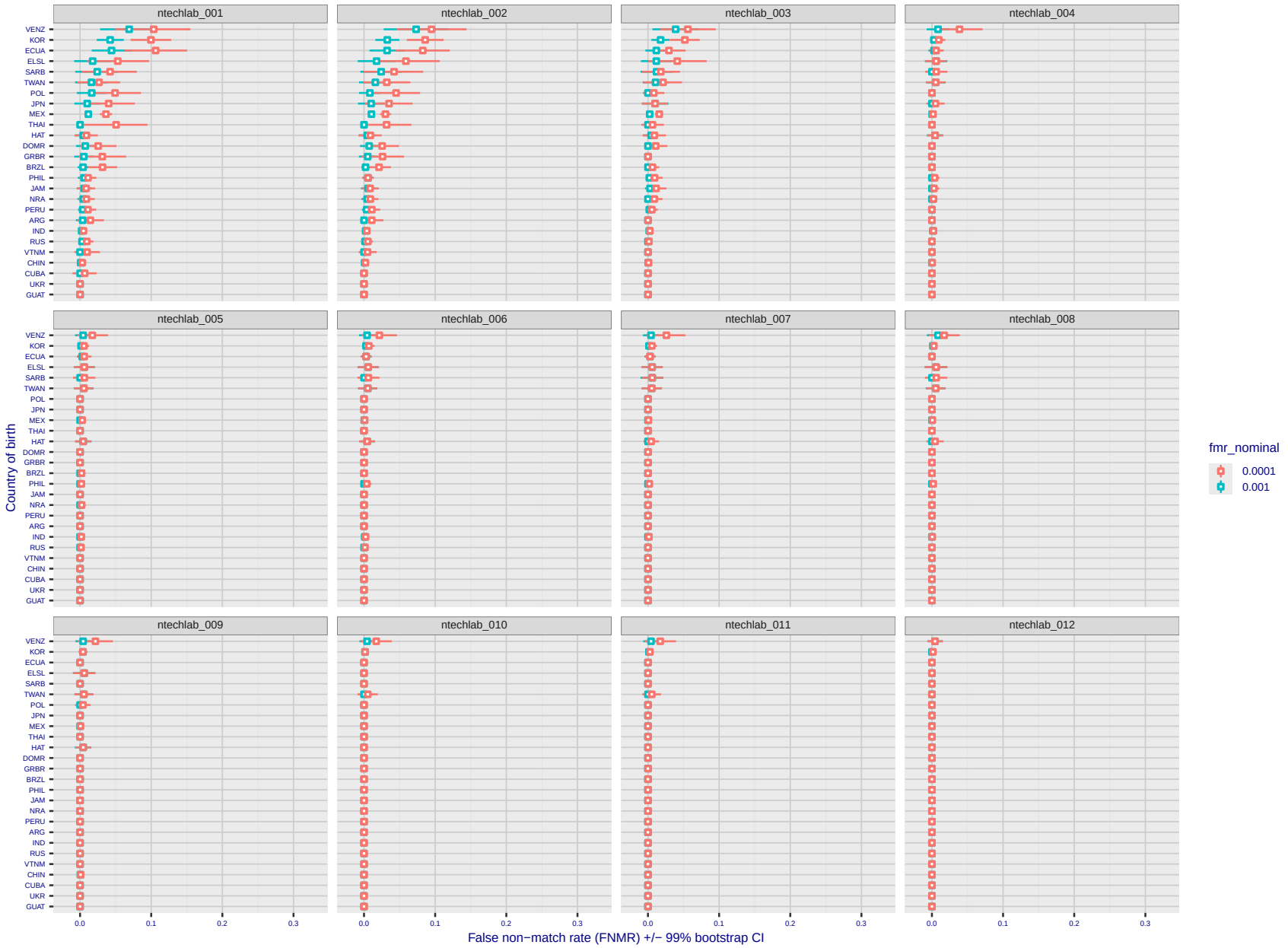

Figure 650: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

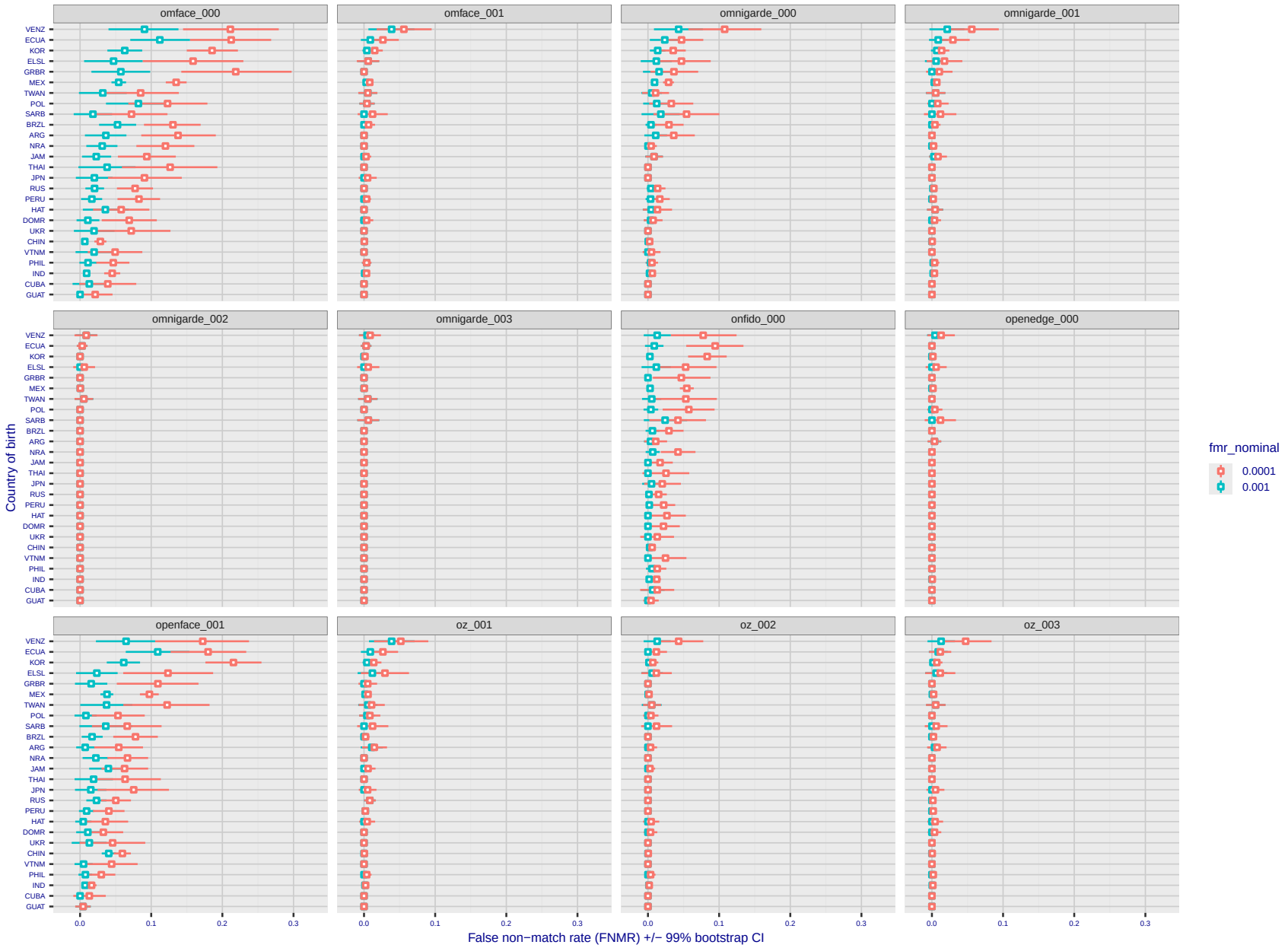

Figure 651: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 652: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

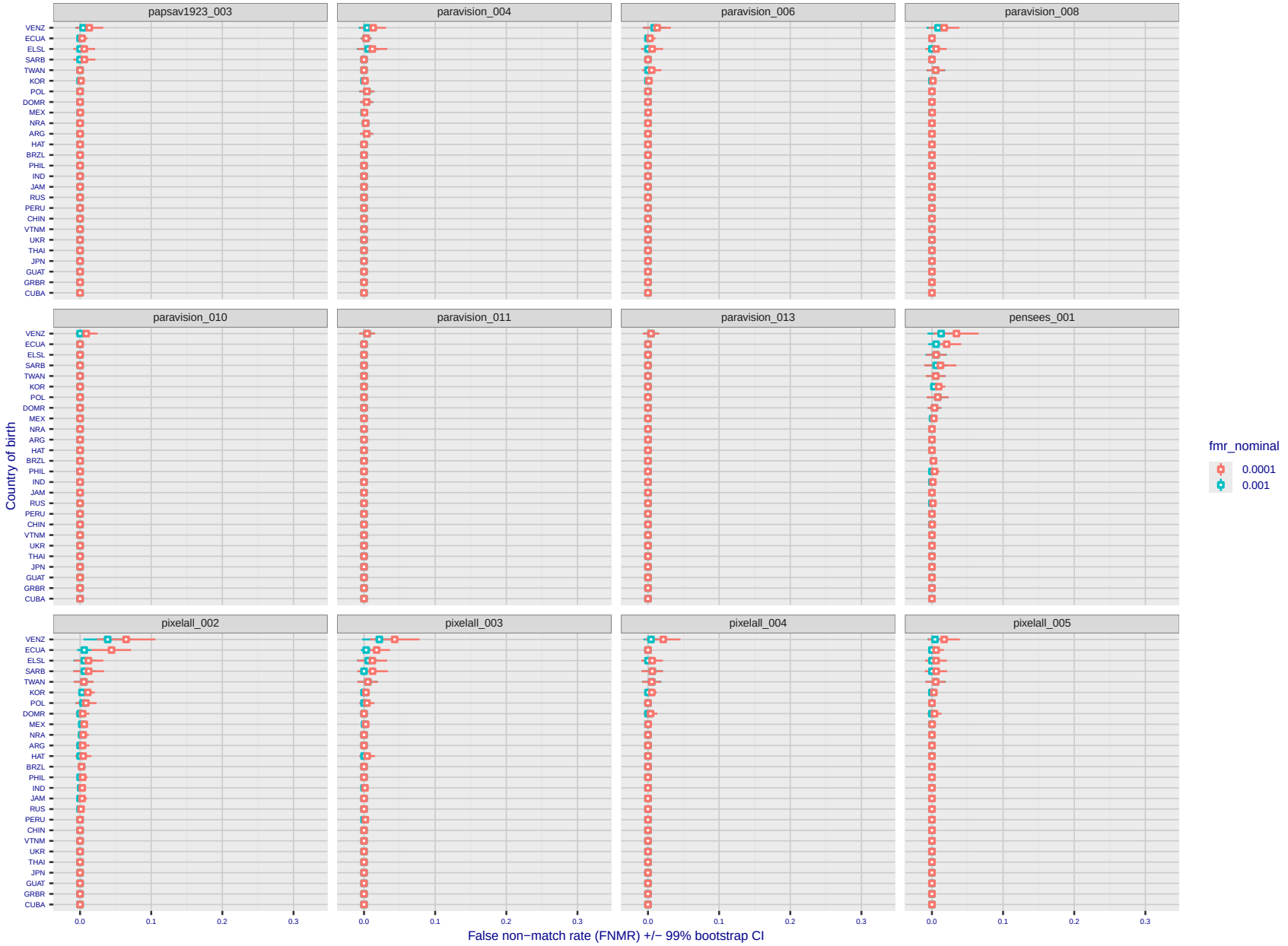

Figure 653: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

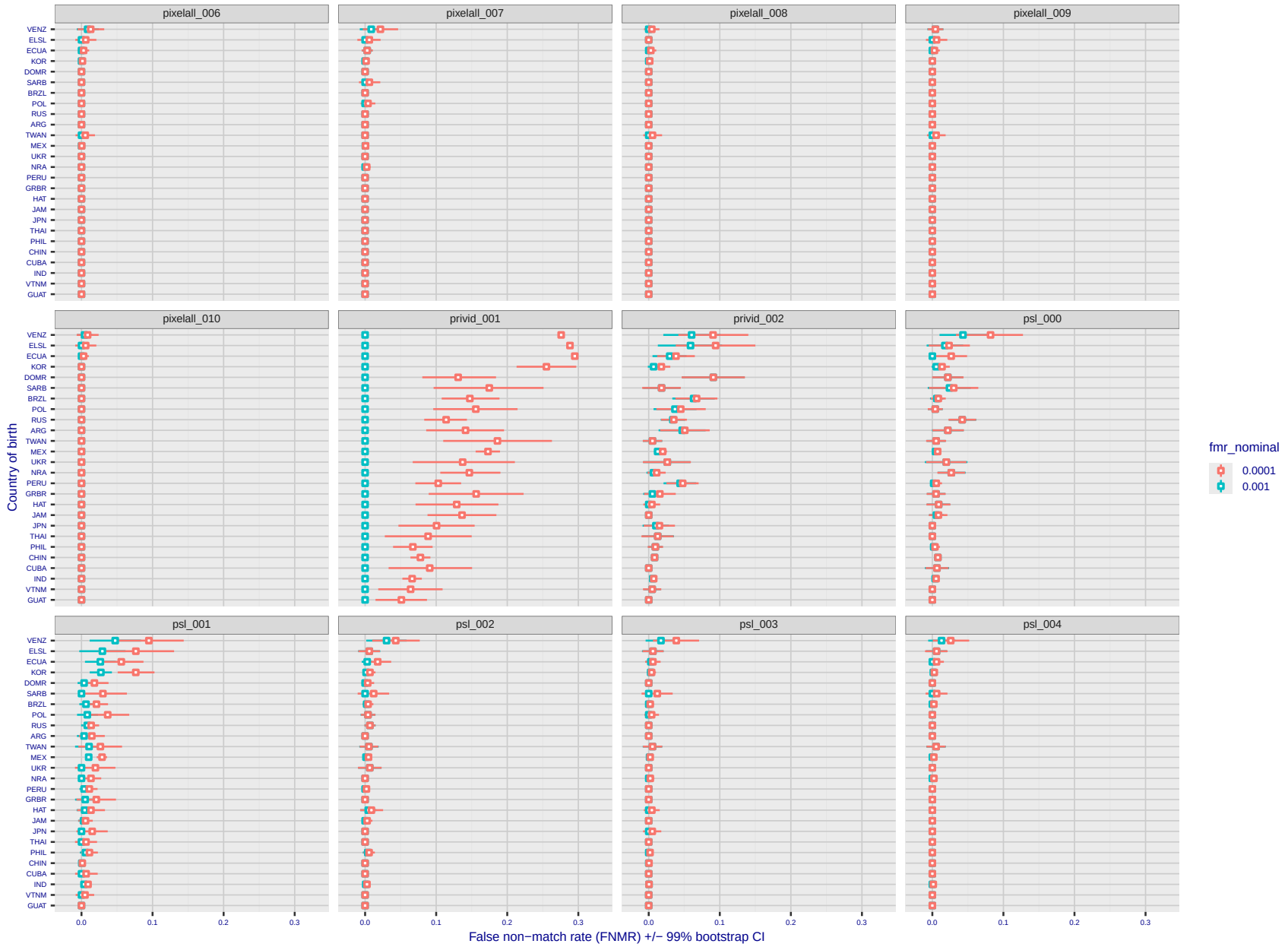

Figure 654: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

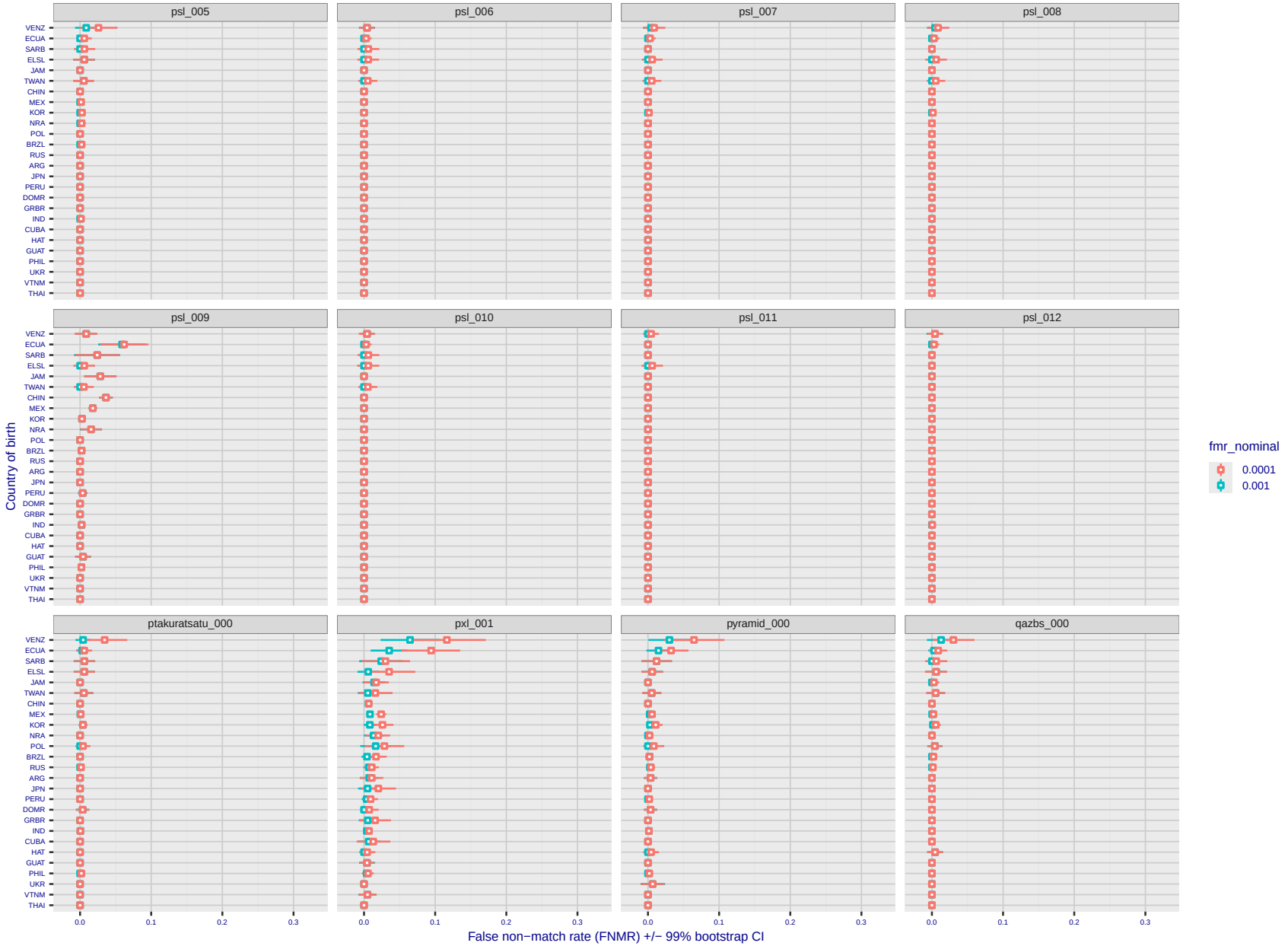

Figure 655: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 656: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

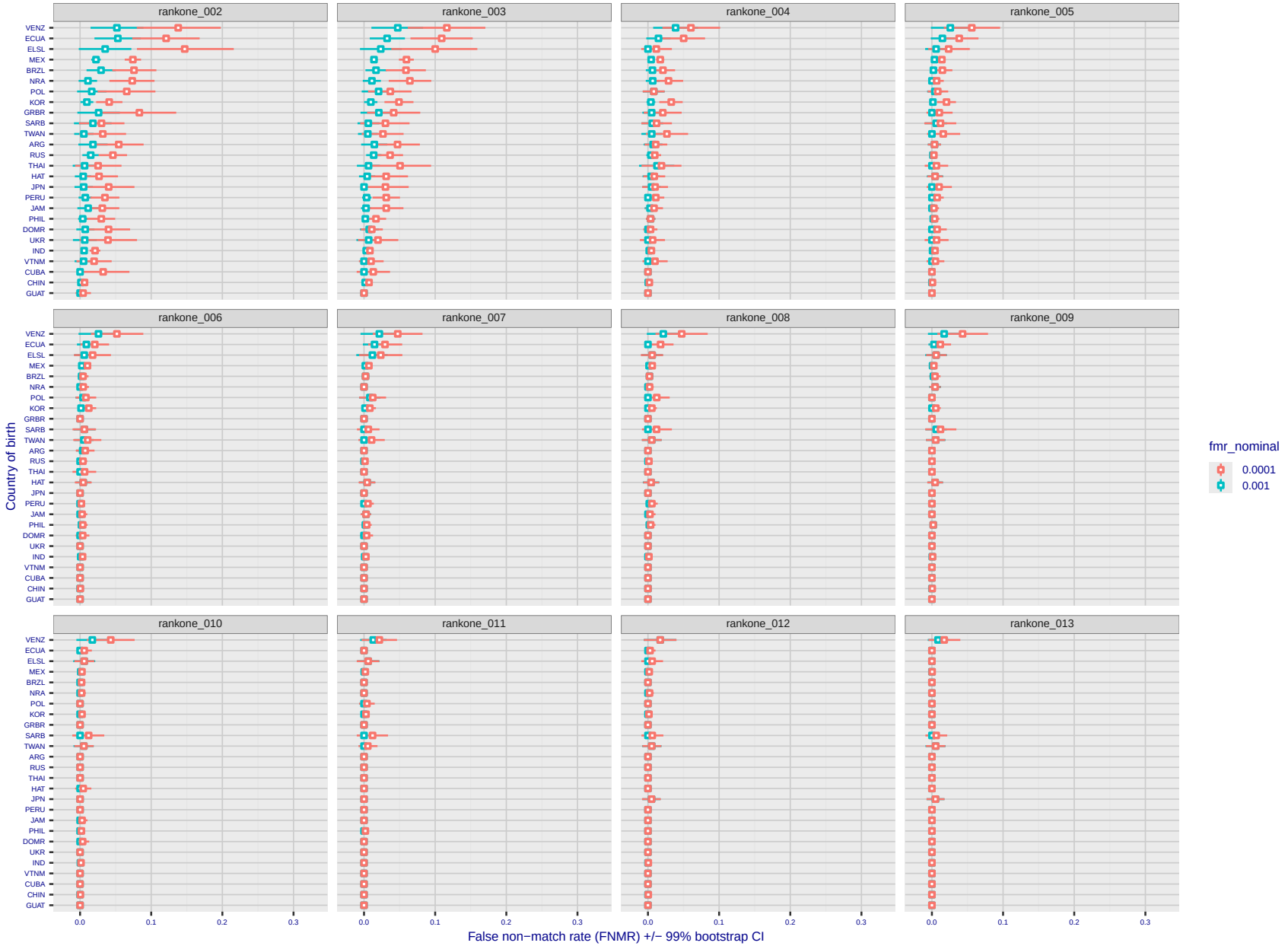

Figure 657: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

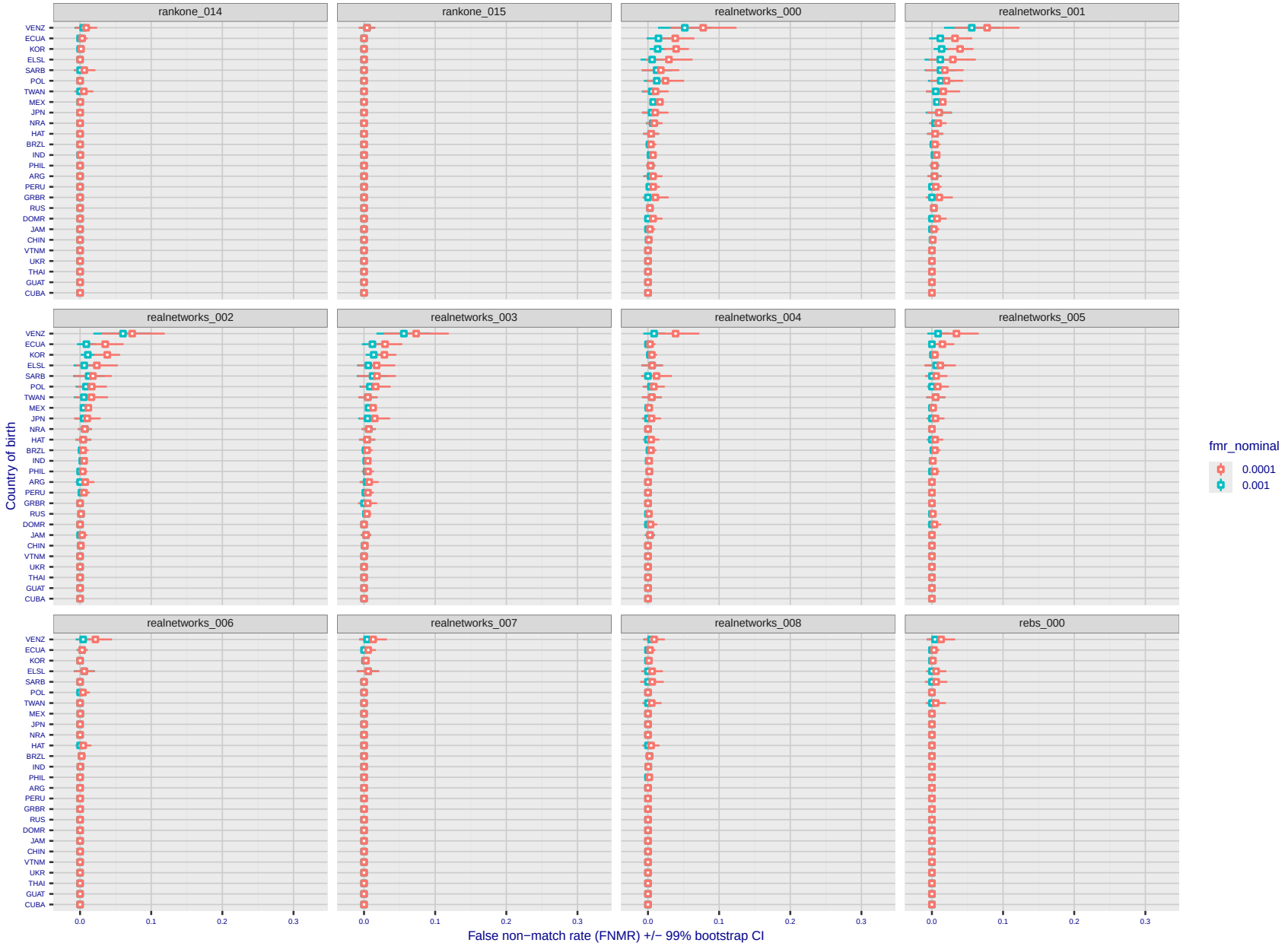

Figure 658: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

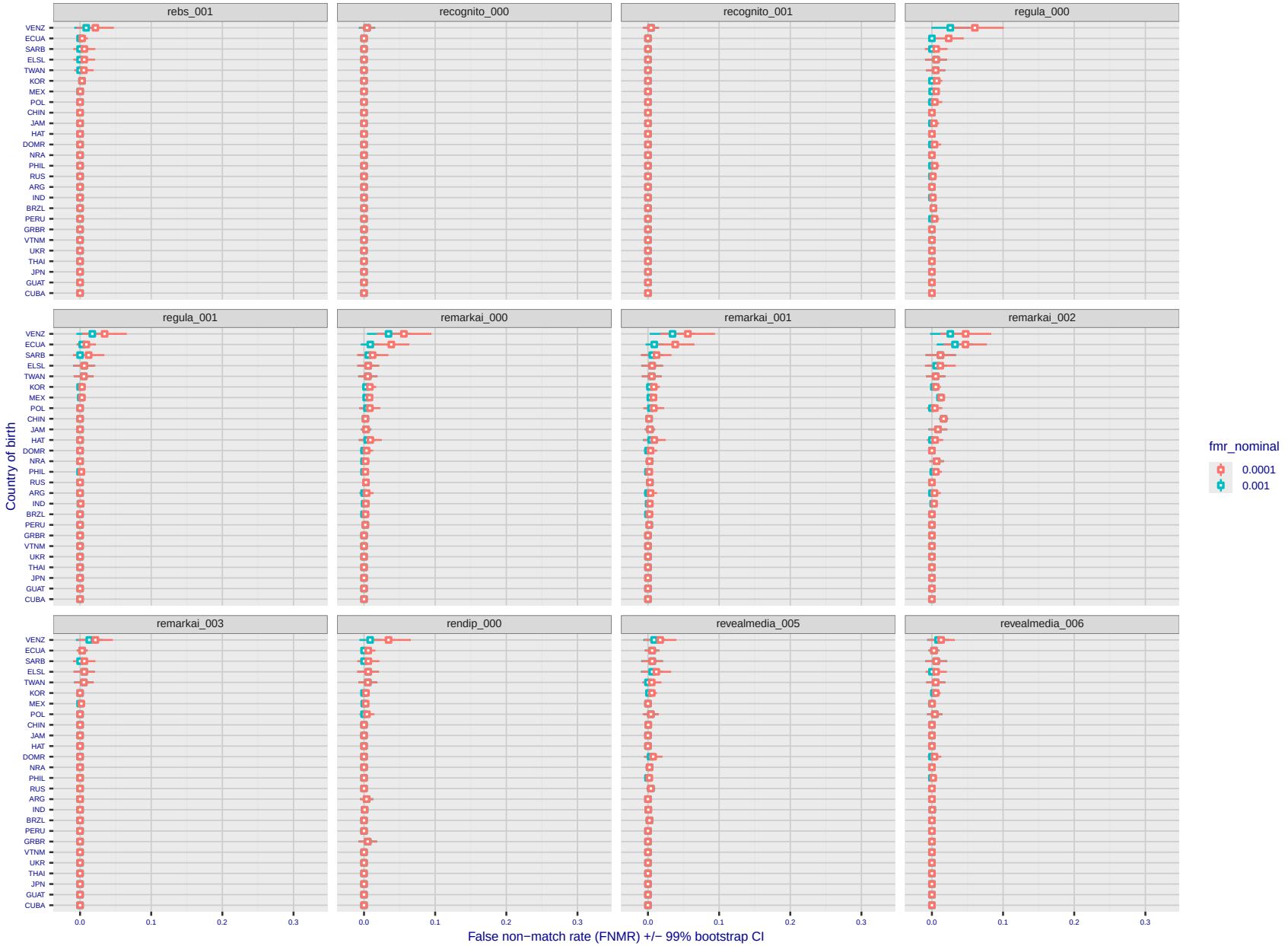

Figure 659: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

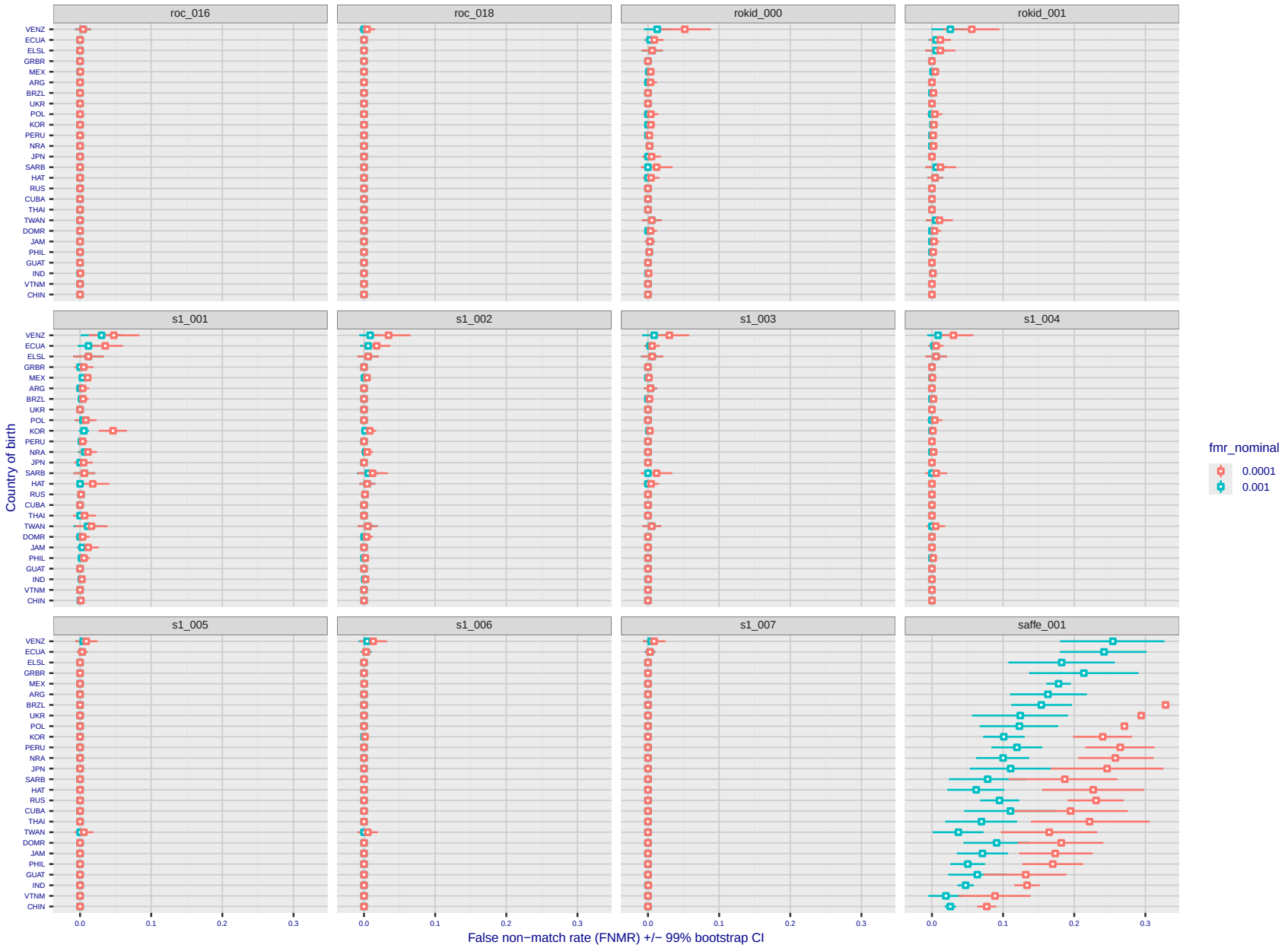

Figure 660: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

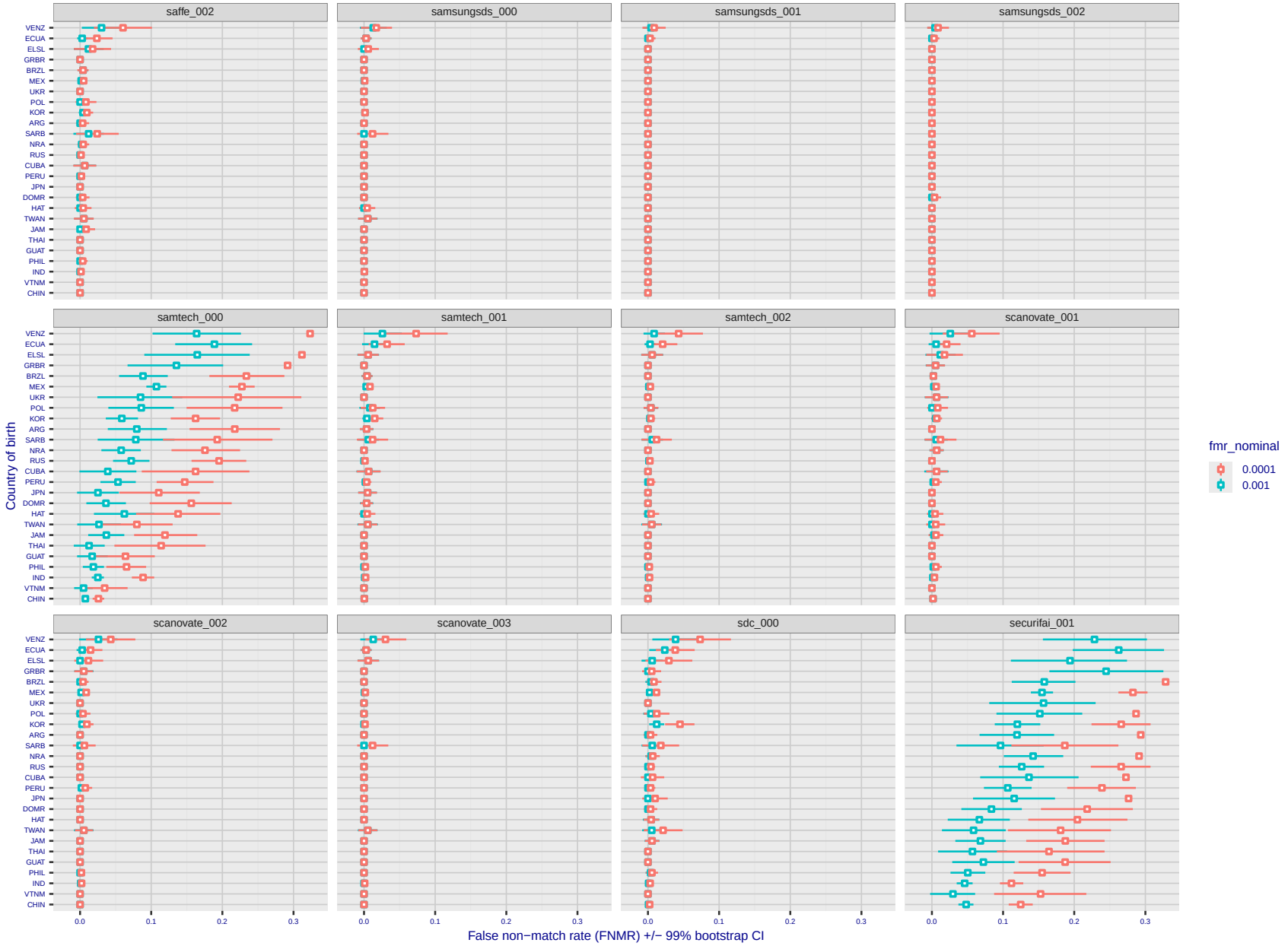

Figure 661: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 662: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

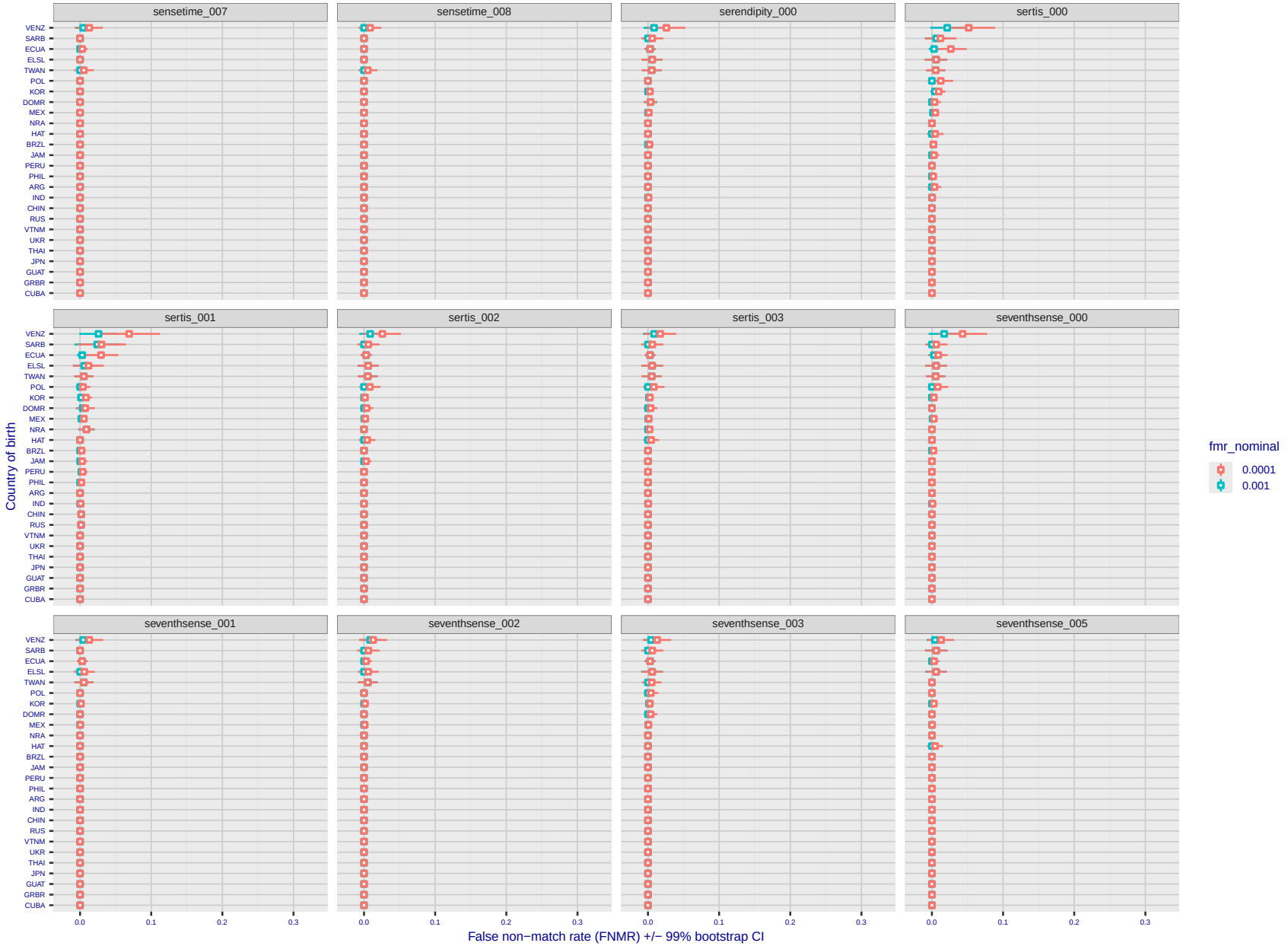

Figure 663: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 664: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 665: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

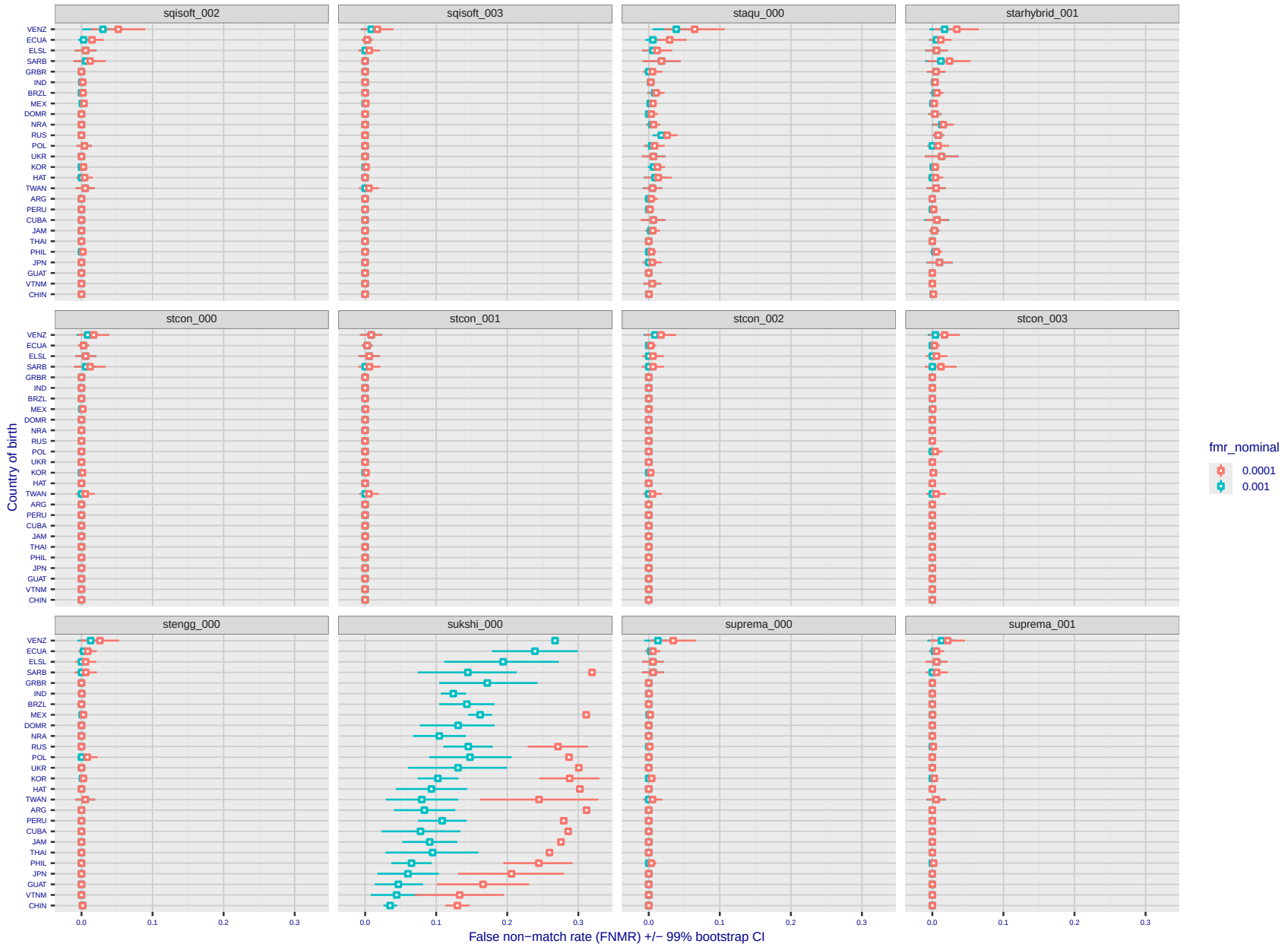

Figure 666: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

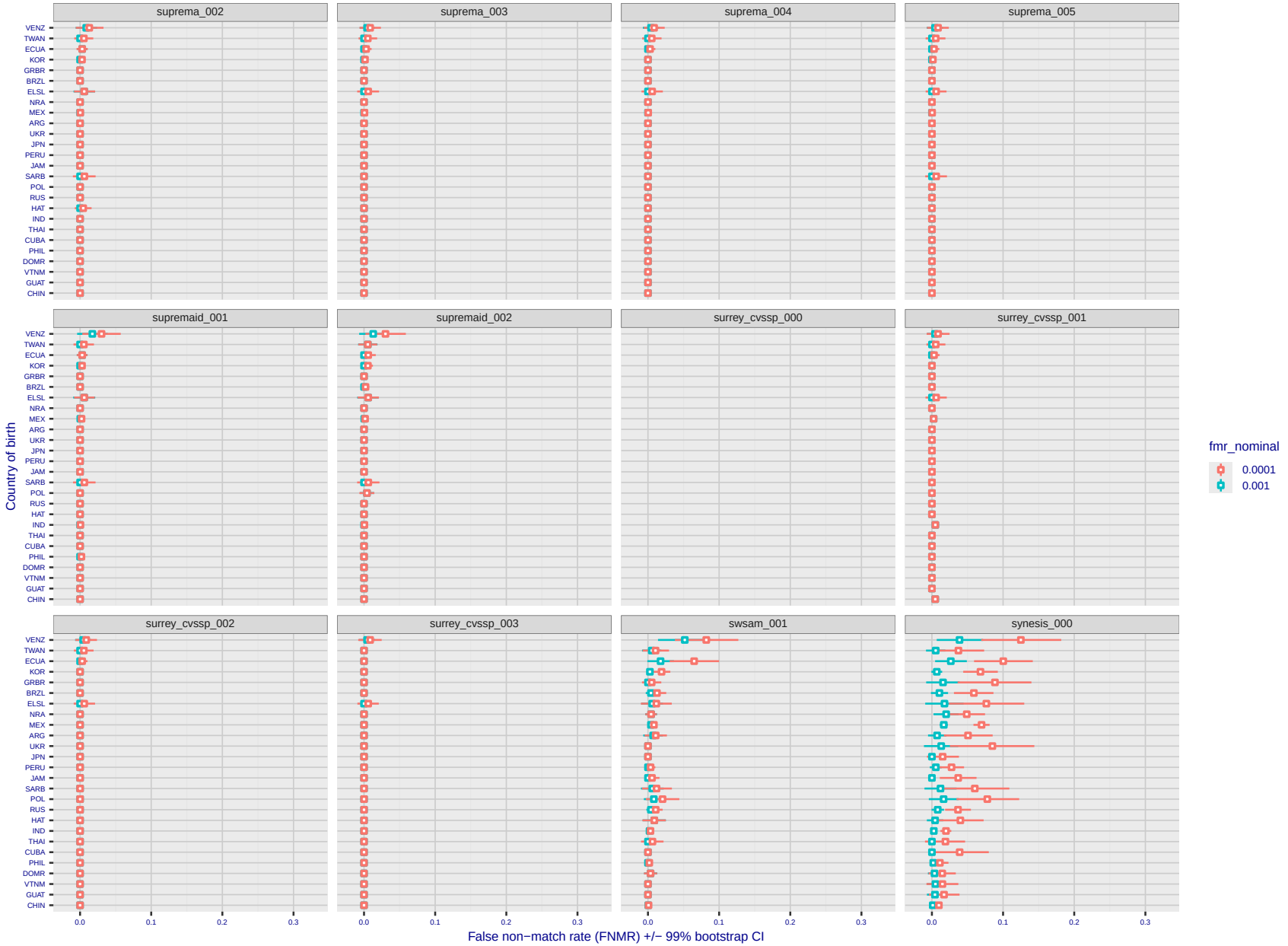

Figure 667: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

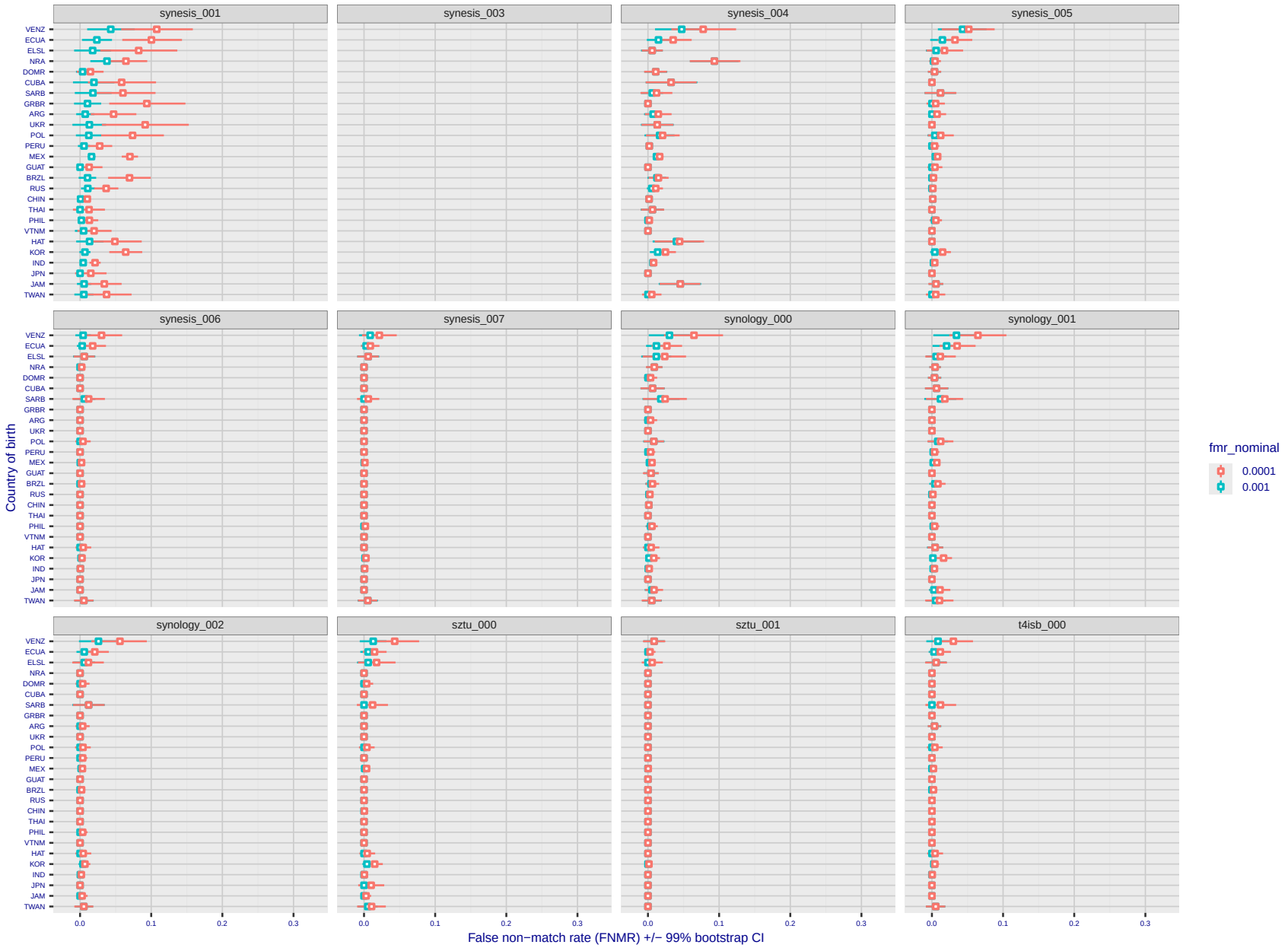

Figure 668: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

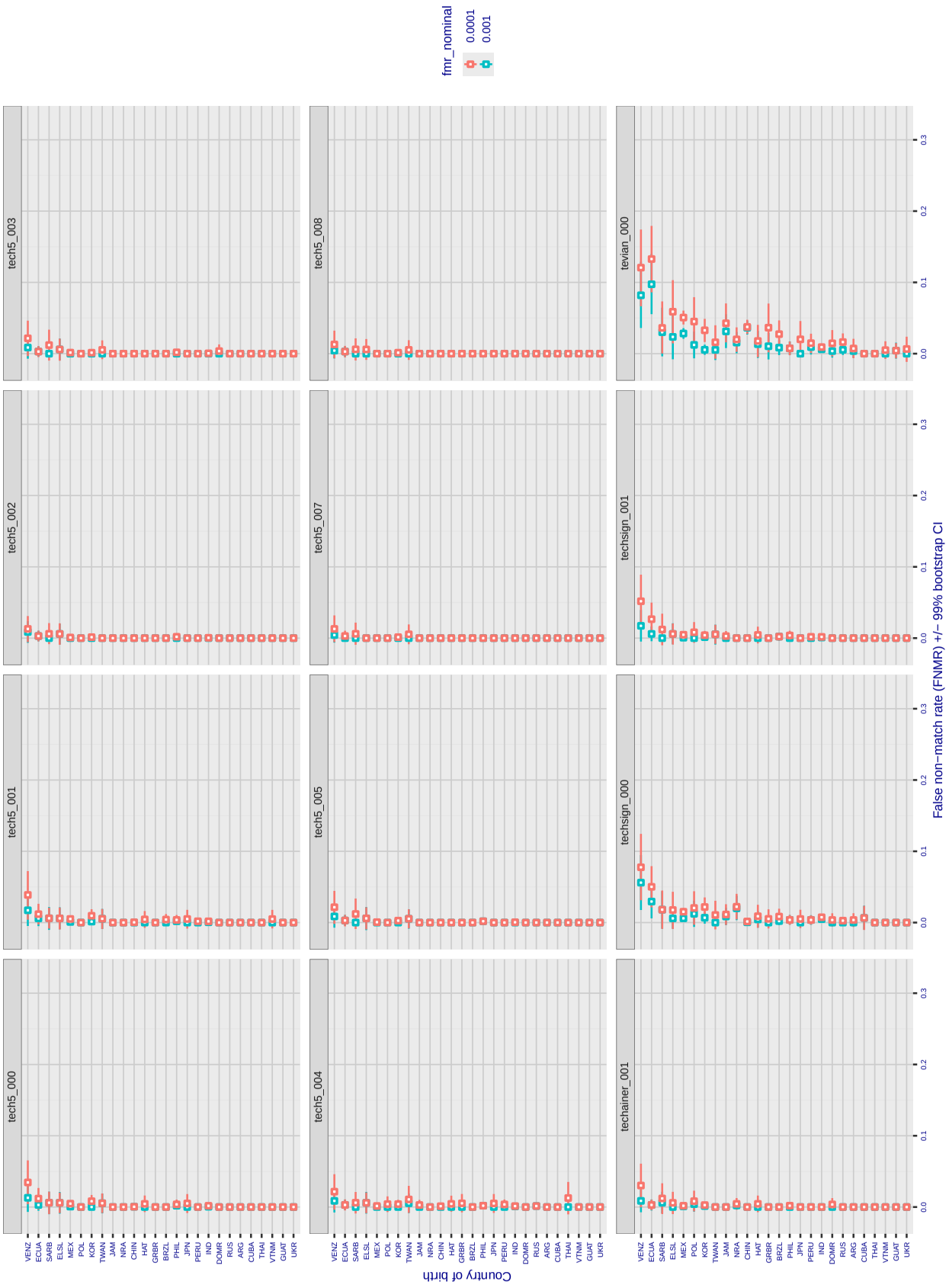

Figure 669: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = {0.001, 0.0001} computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

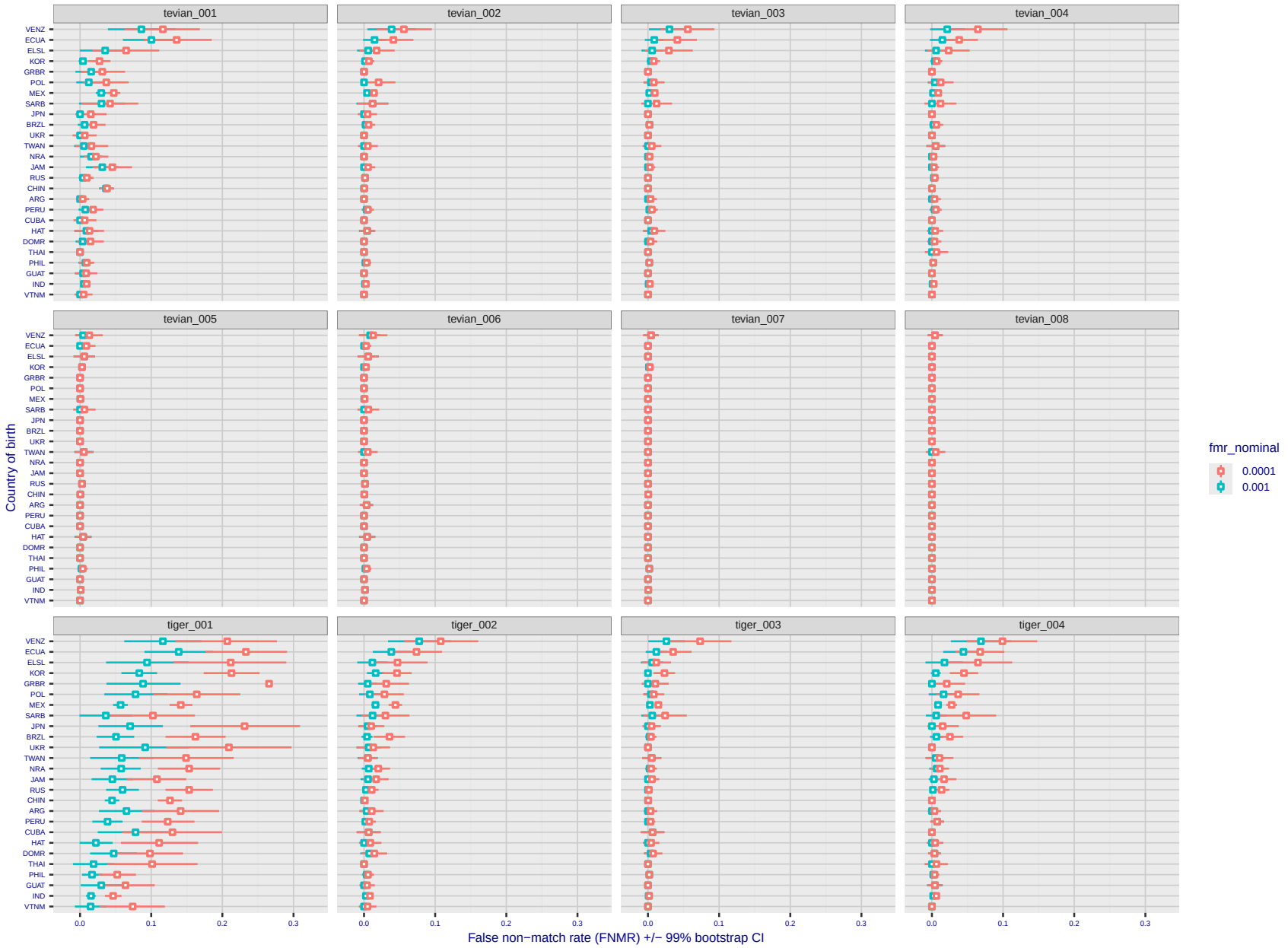

Figure 670: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

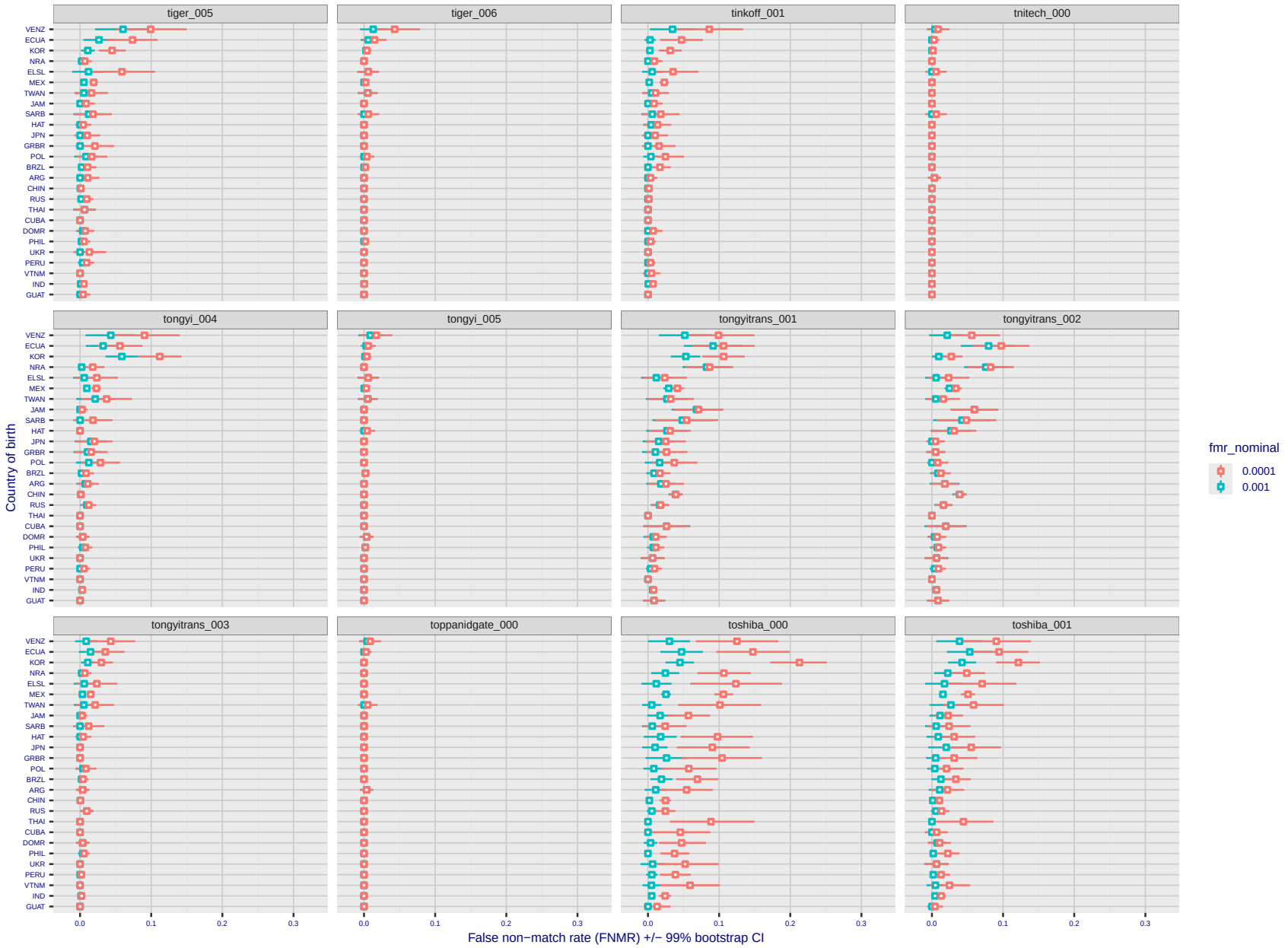

Figure 671: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

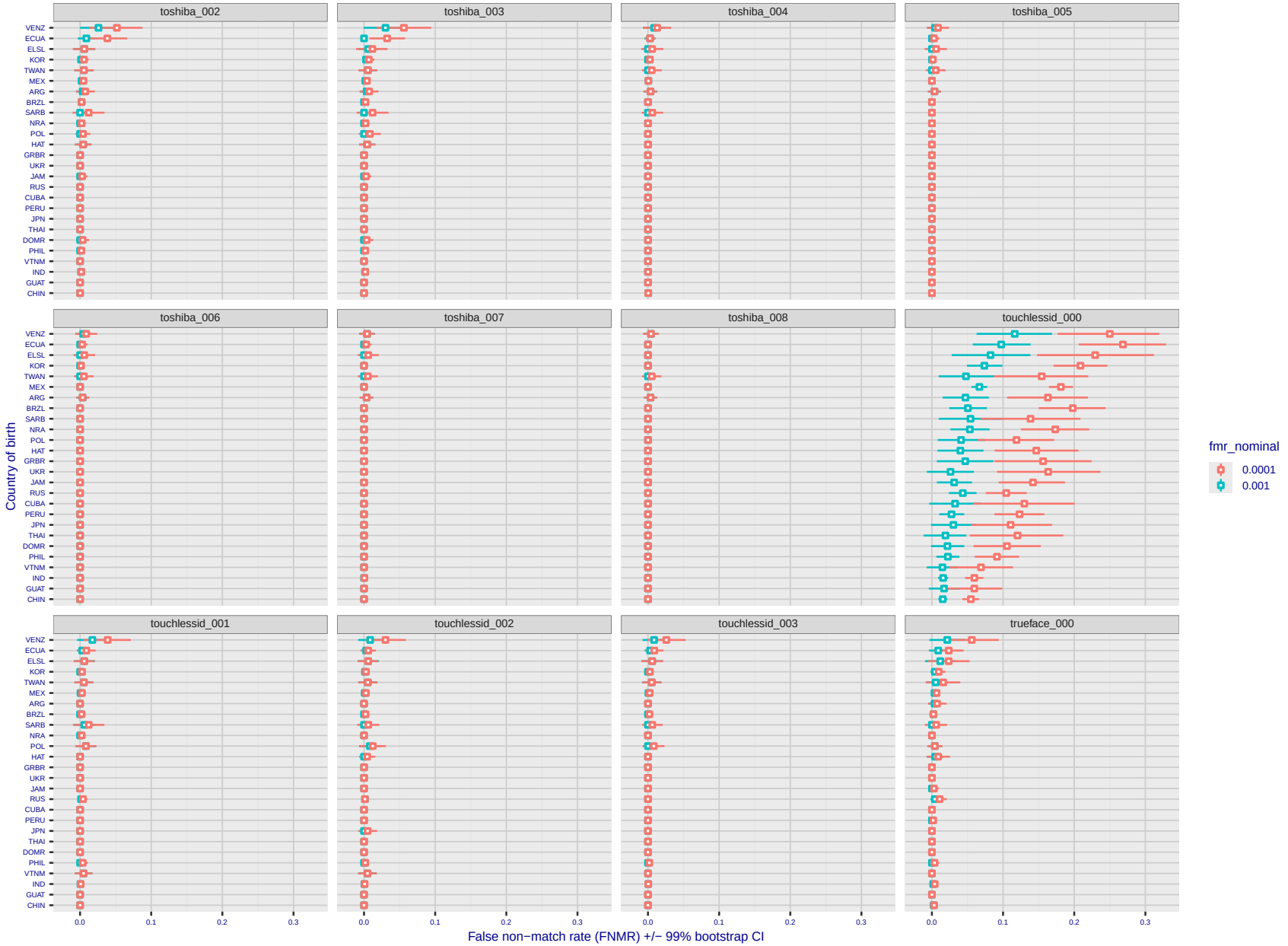

Figure 672: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 673: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 674: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 675: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

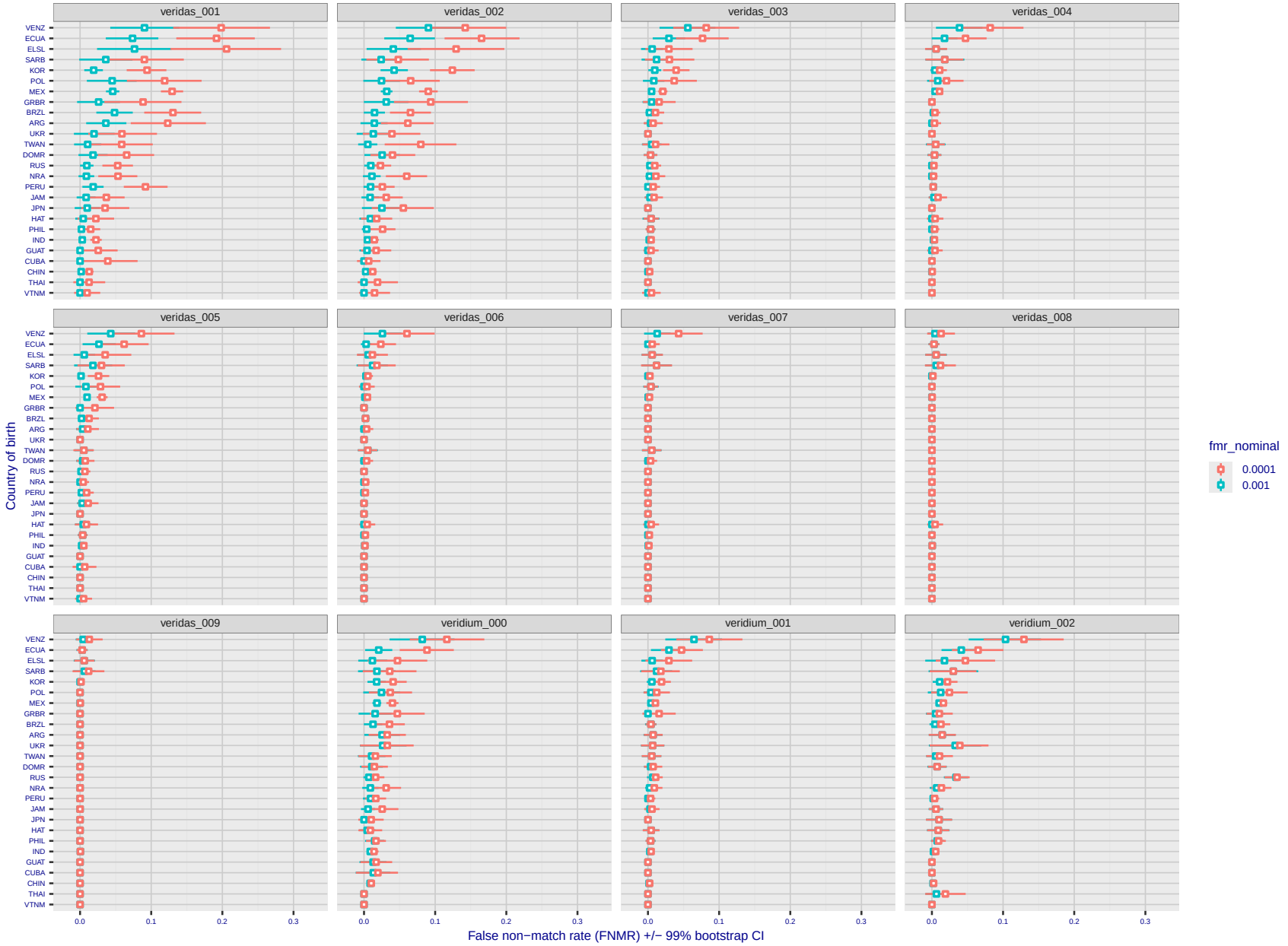

Figure 676: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 677: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

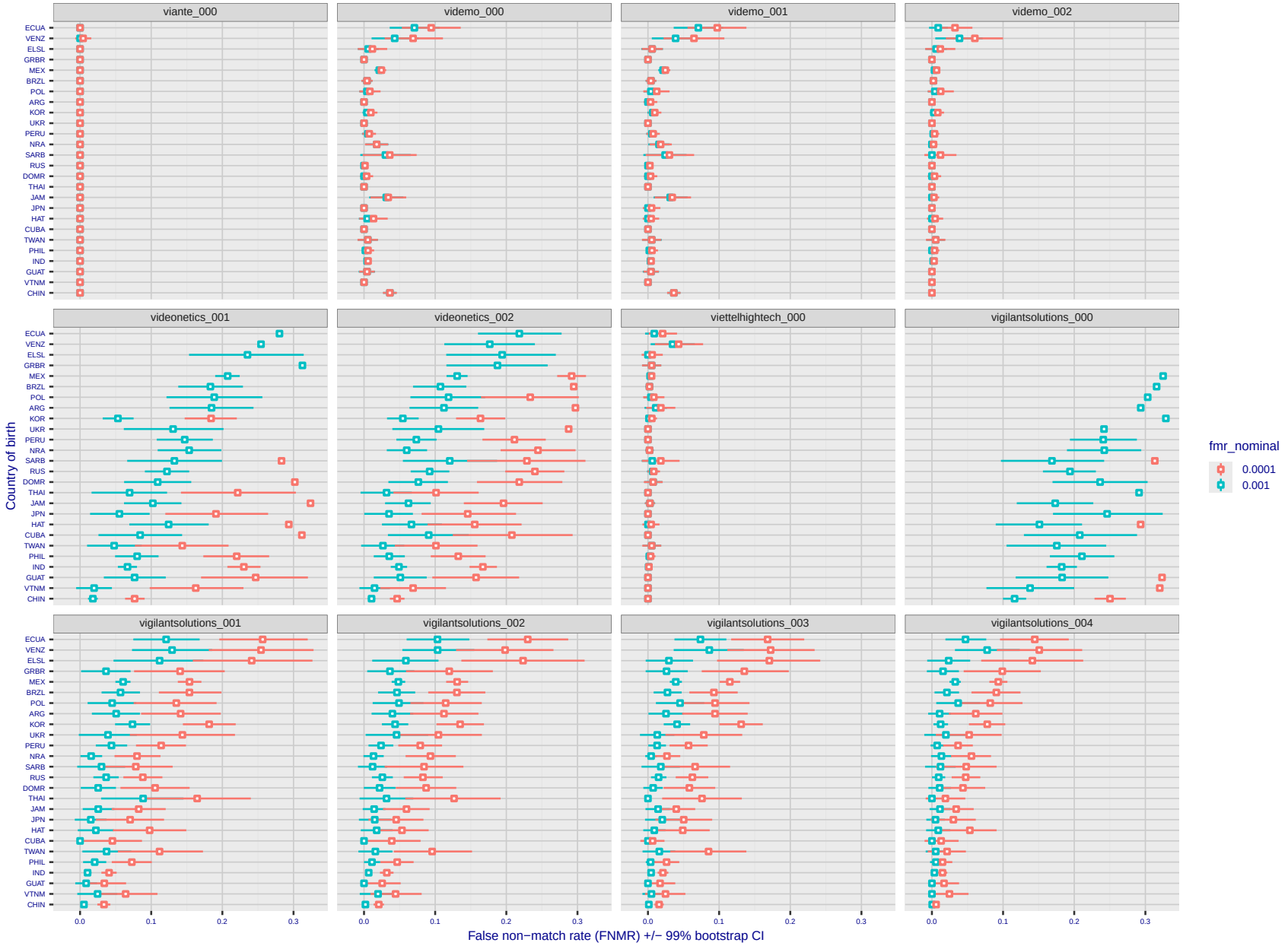

Figure 678: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

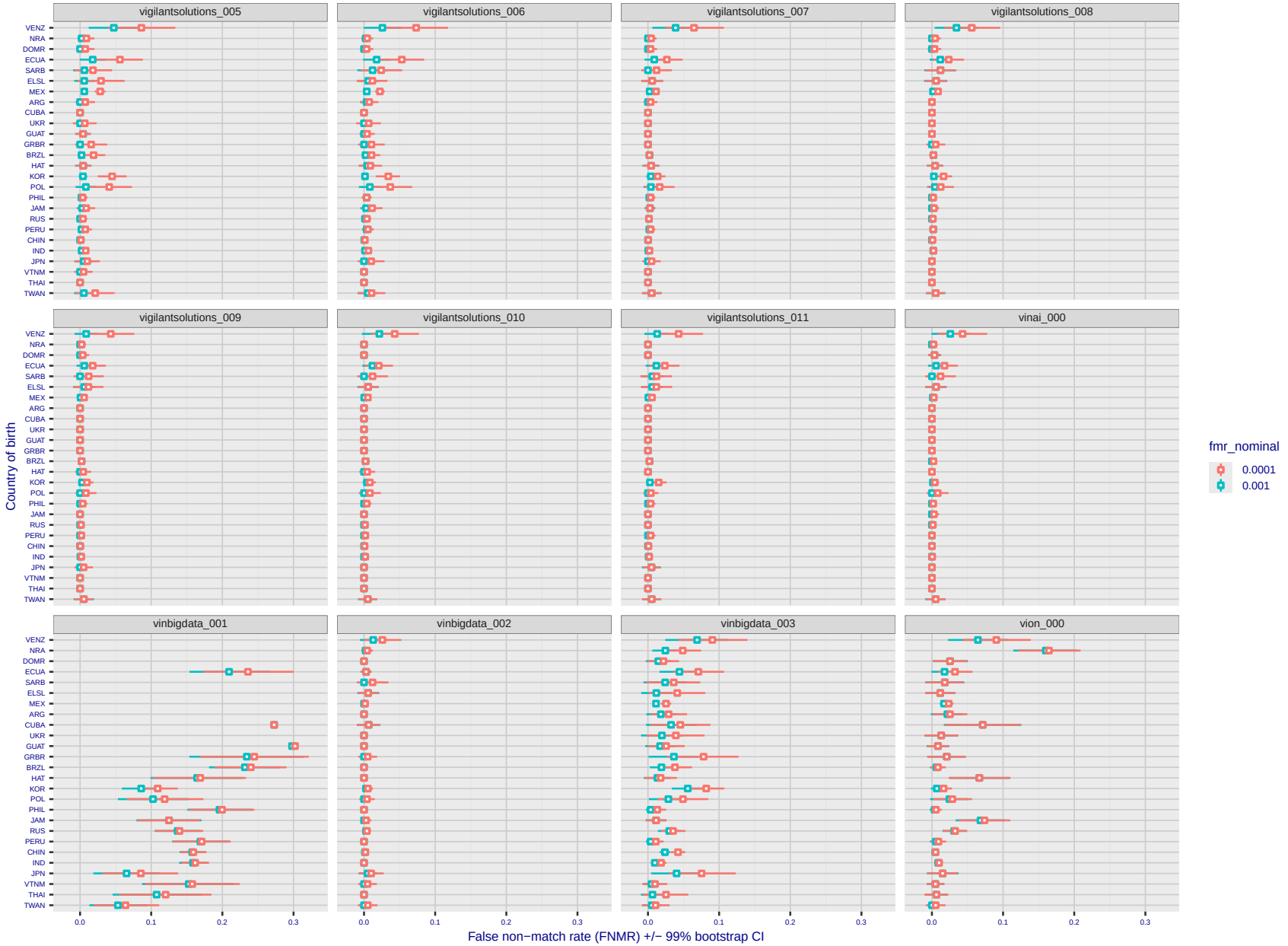

Figure 679: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

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FNMR(T) "False non-match rate"
FMR(T) "False match rate"

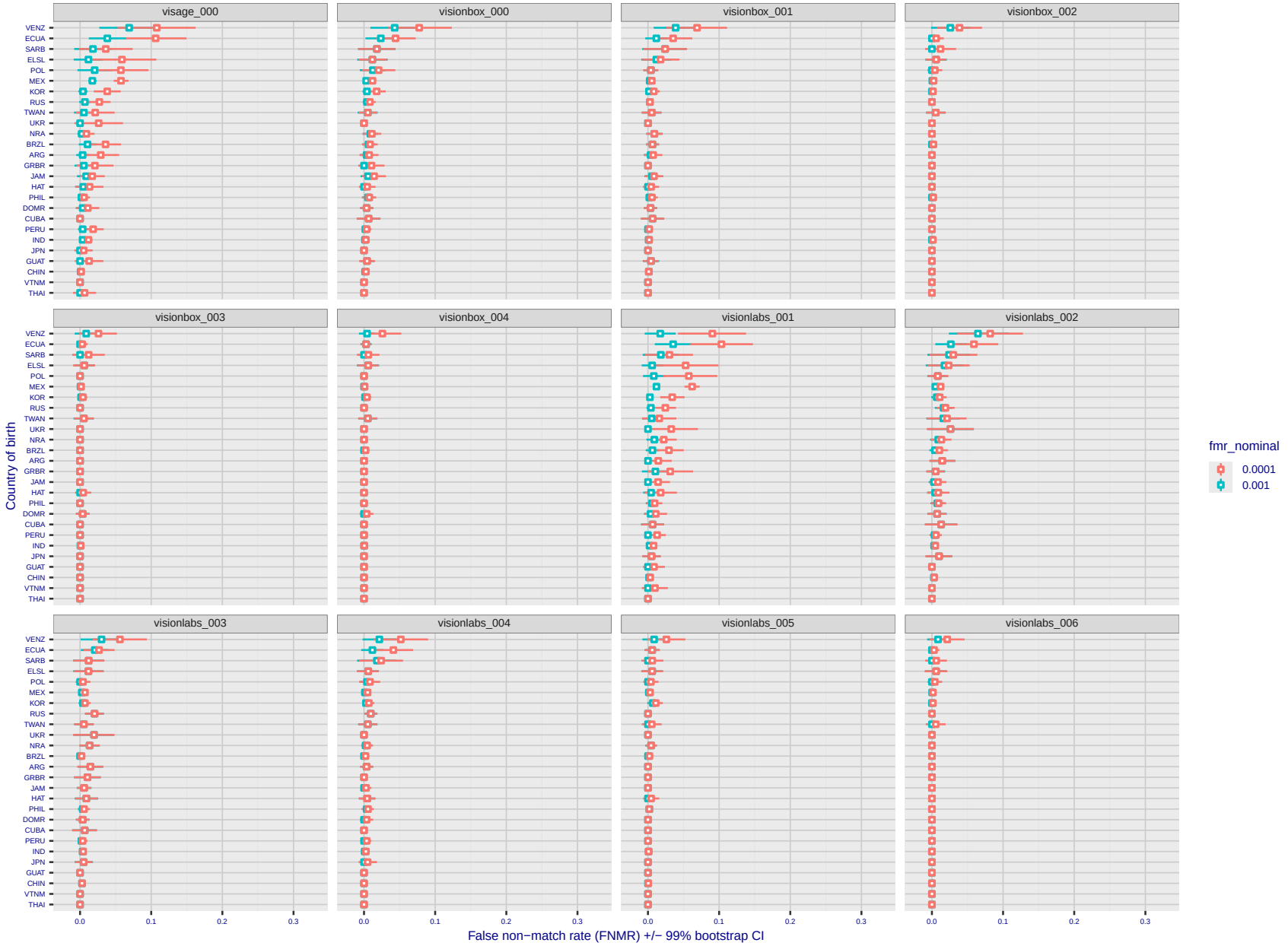

Figure 680: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

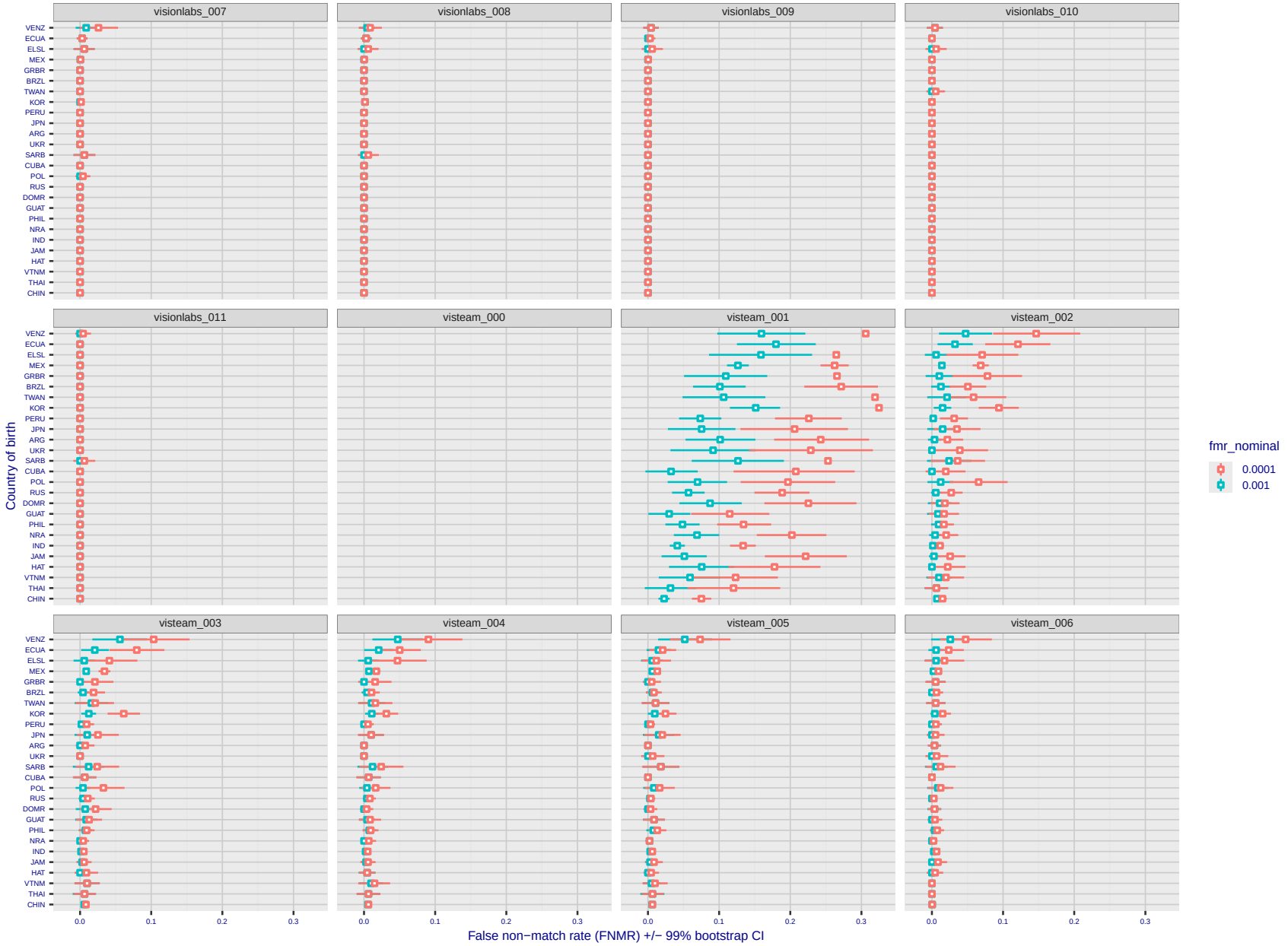

Figure 681: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 682: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

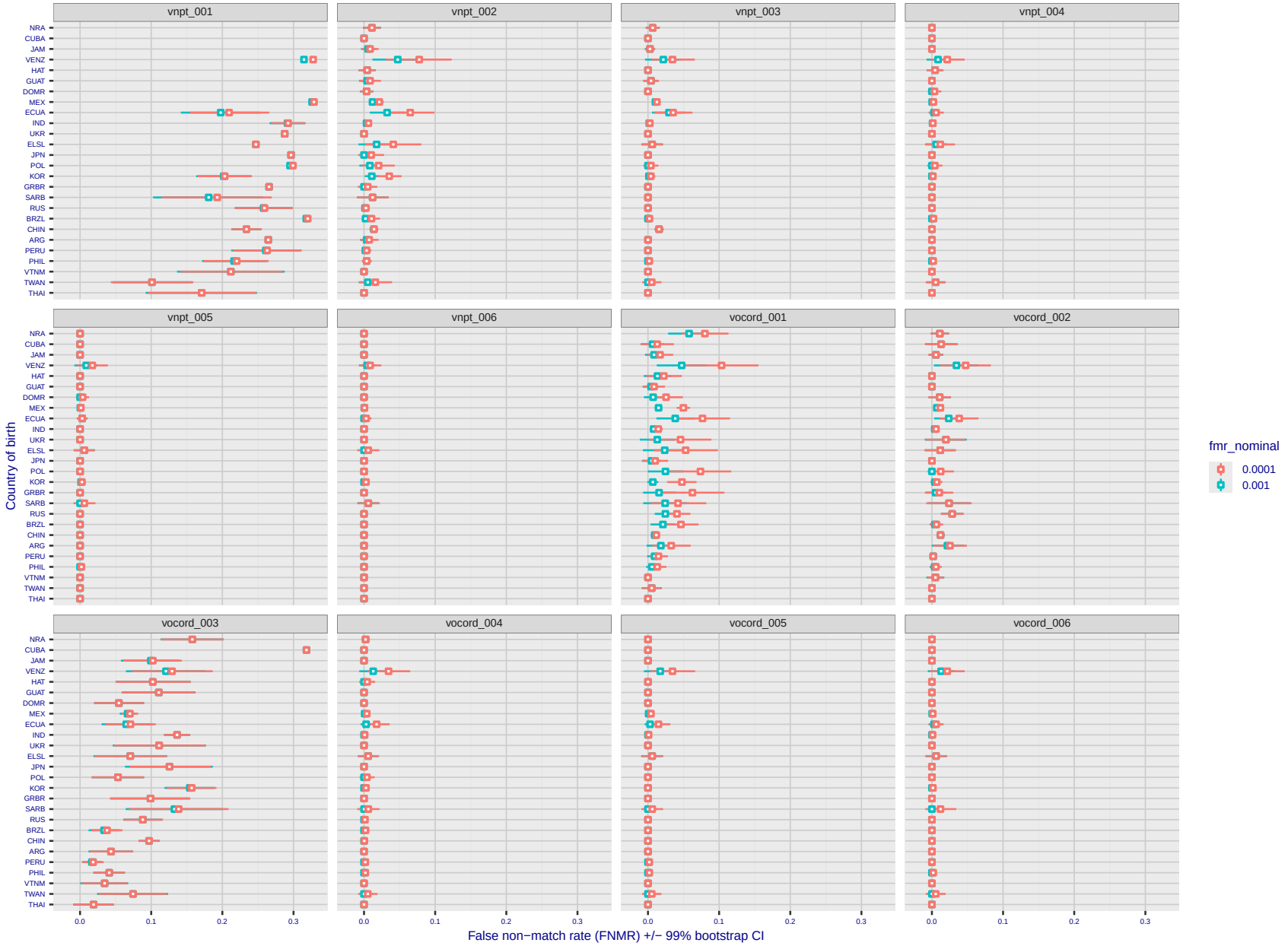

Figure 683: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

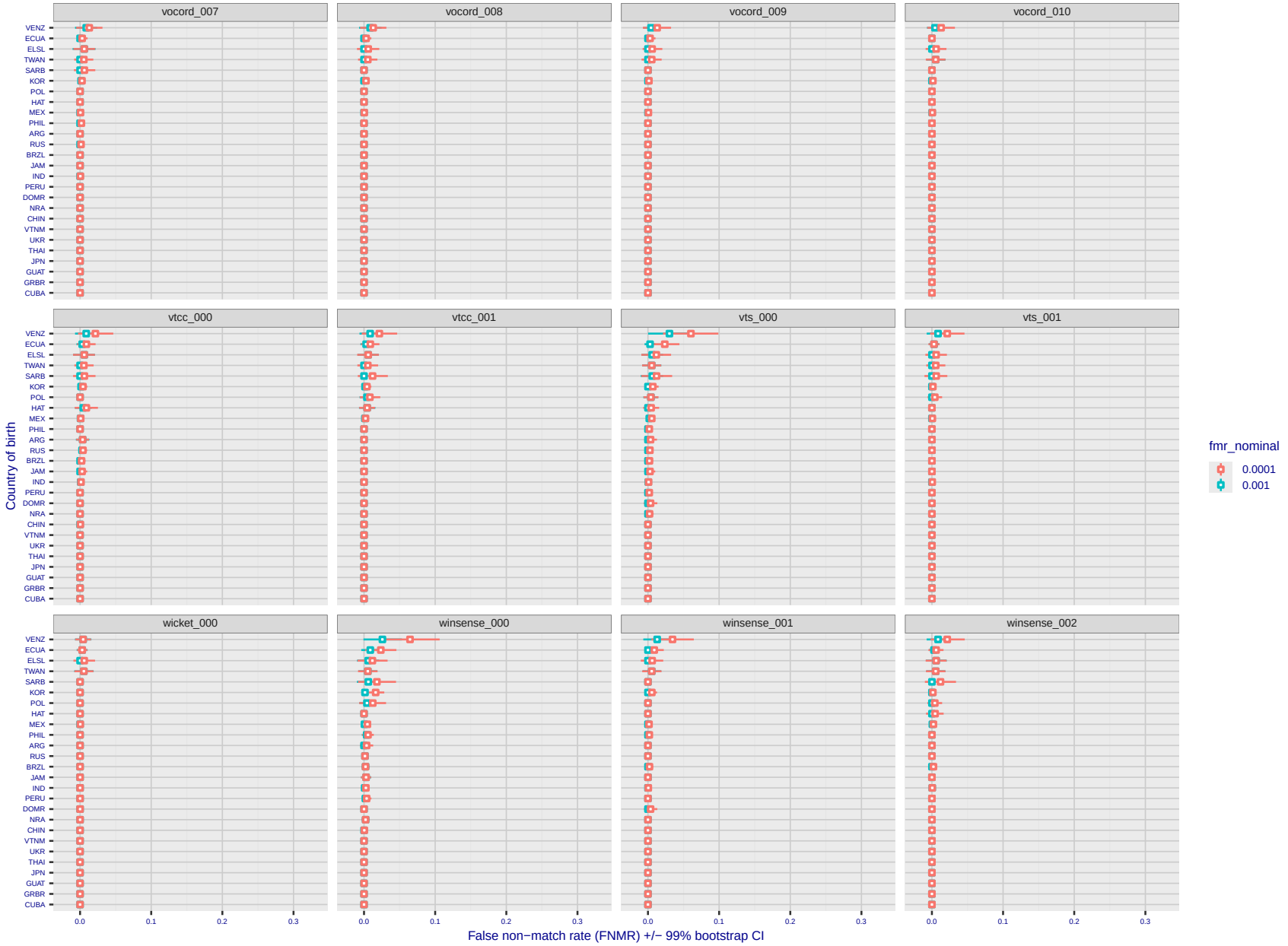

Figure 684: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

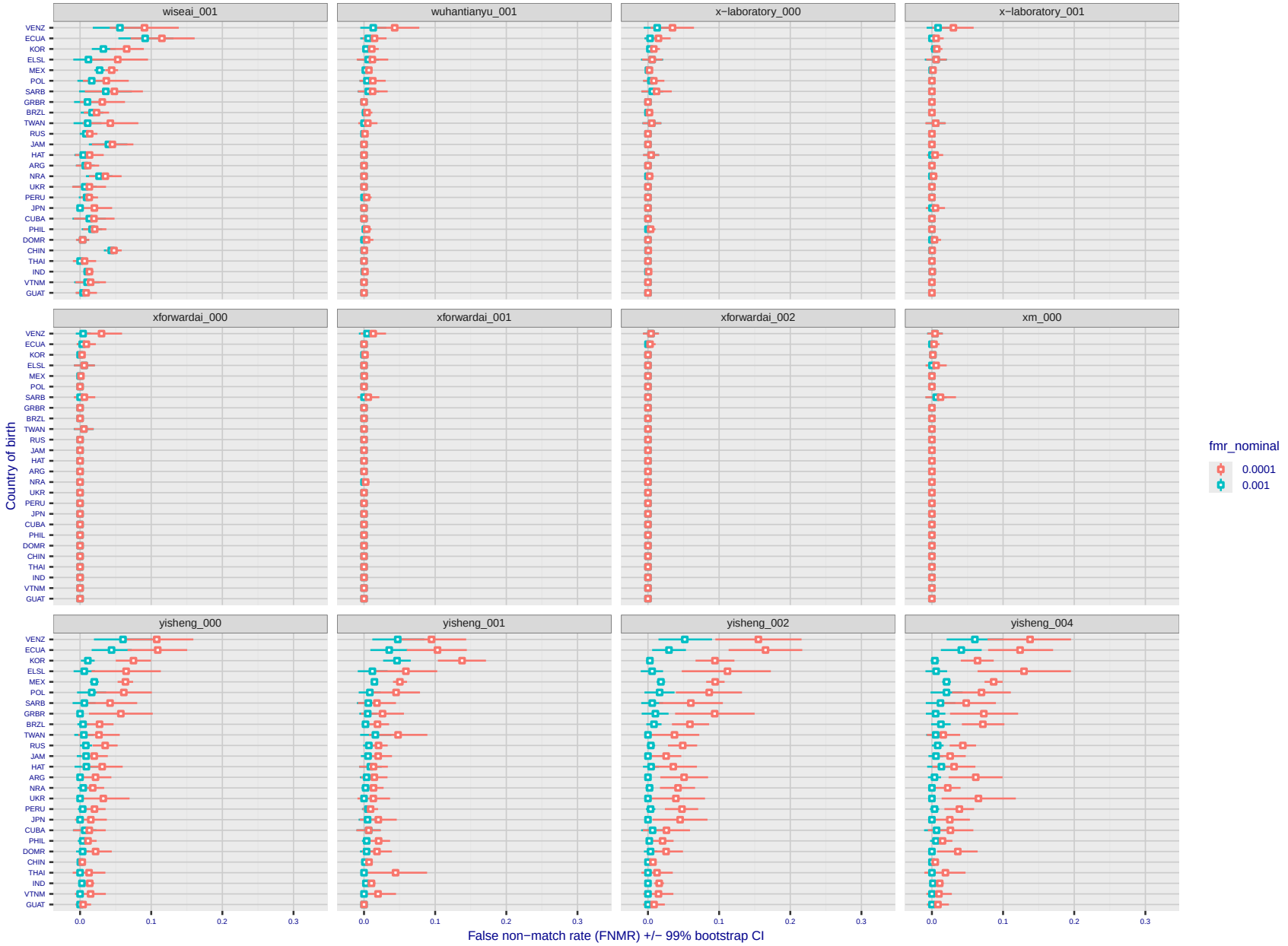

Figure 685: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

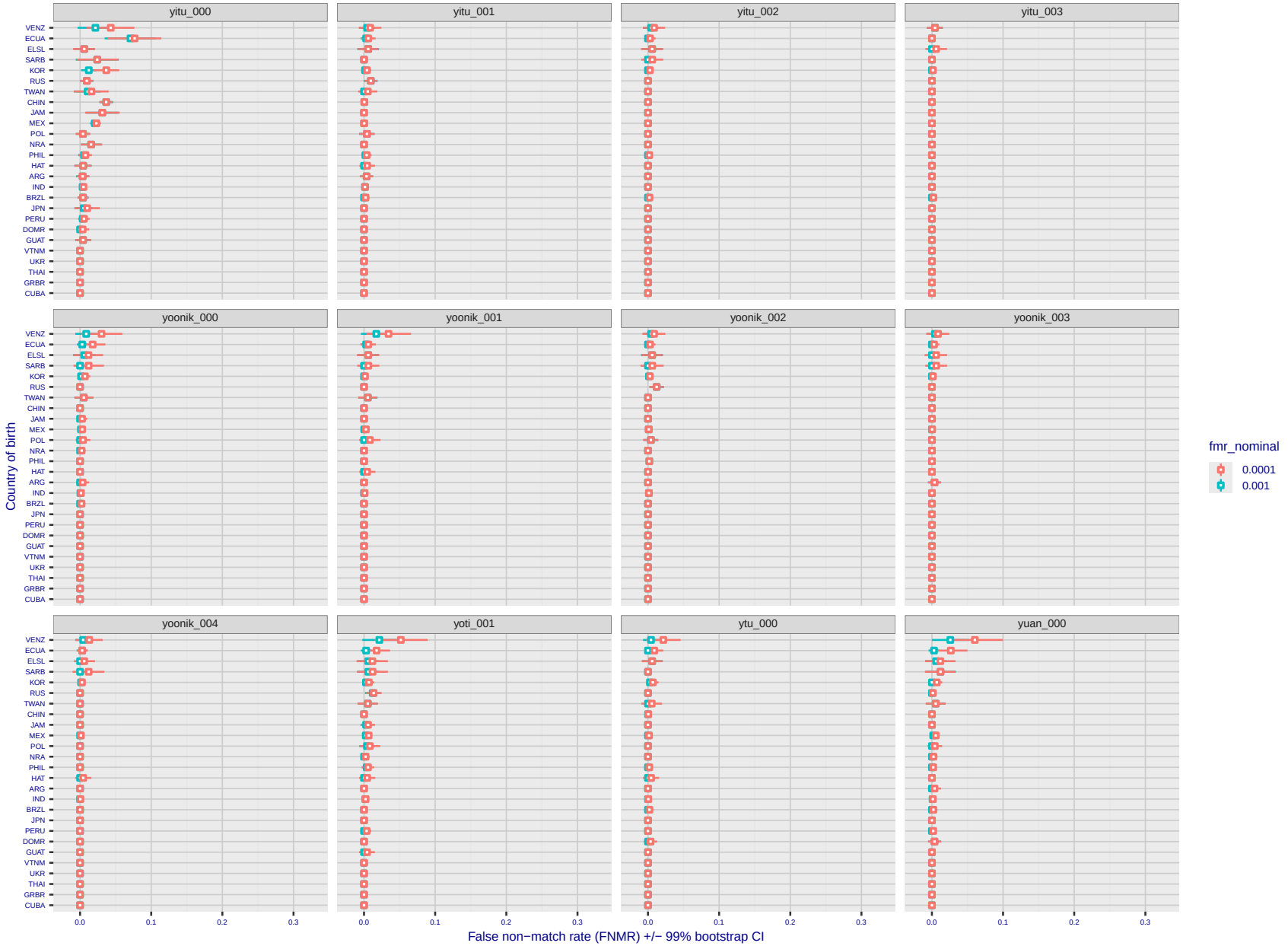

Figure 686: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

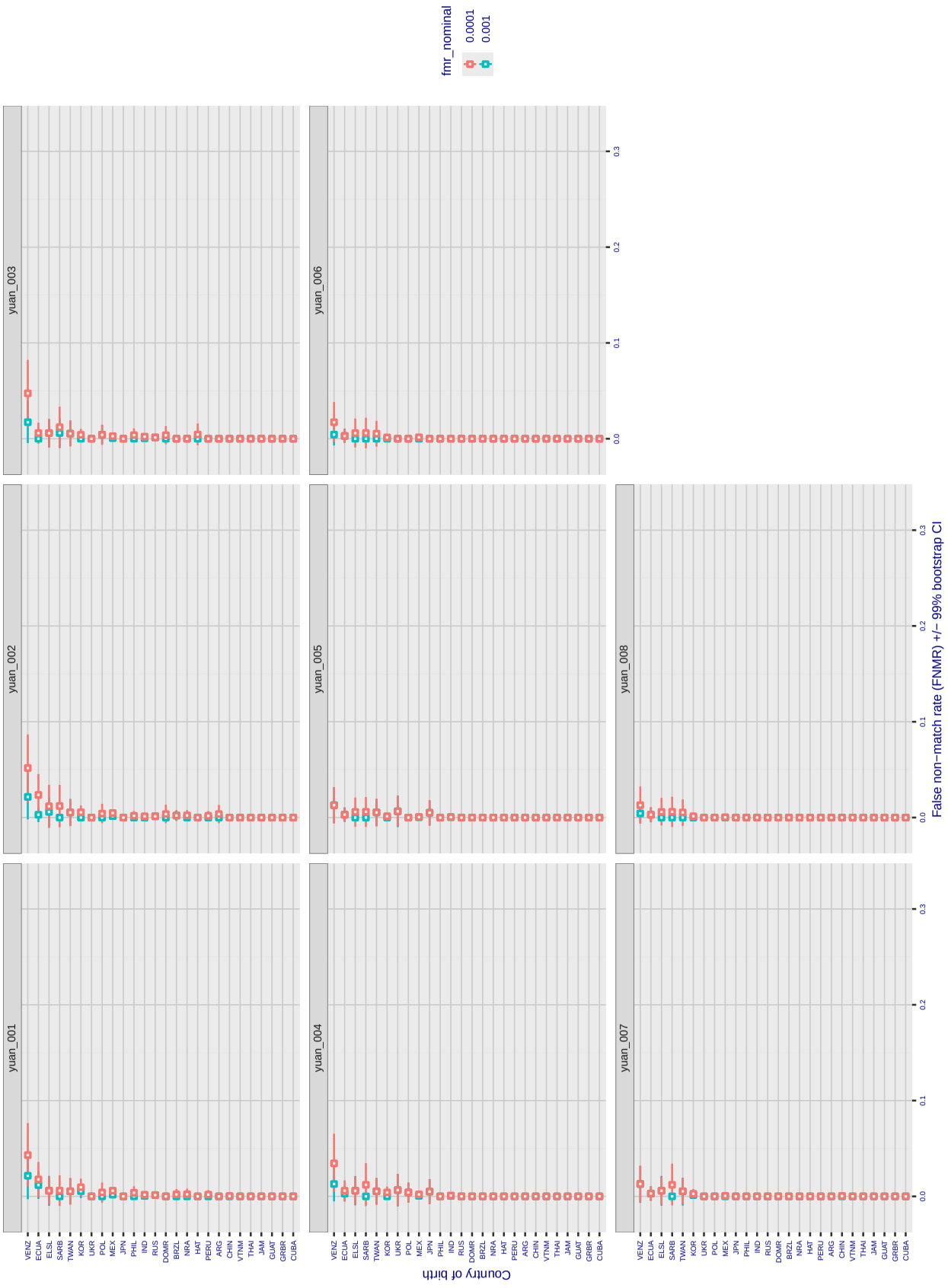

Figure 687: For the visa images, the dots show FNMR by country of birth for two globally set operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.1. The figures shows an order of magnitude variation in FNMR across country of birth; these effects are likely due quality variations, then demographics like age and race. The error rates in some cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Caveats: The results may not relate to subject-specific properties. Instead they could reflect image-specific quality differences, which could occur due to collection protocol or software processing variations.

3.5.2 Effect of ageing

Background: Faces change appearance throughout life. This change gradually reduces similarity of a new image to an earlier image. Face recognition algorithms give reduced similarity scores and more frequent false rejections.

Goal: To quantify false non-match rates (FNMR) as a function of elapsed time in an adult population.

Methods: Using the mugshot images, a threshold is set to give FMR = 0.00001 over the entire impostor set. Then FNMR is measured over 1000 bootstrap replications of the genuine scores.

Results: For the visa images, Figure 767 shows how false non-match rates for genuine users, as a function of age group.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

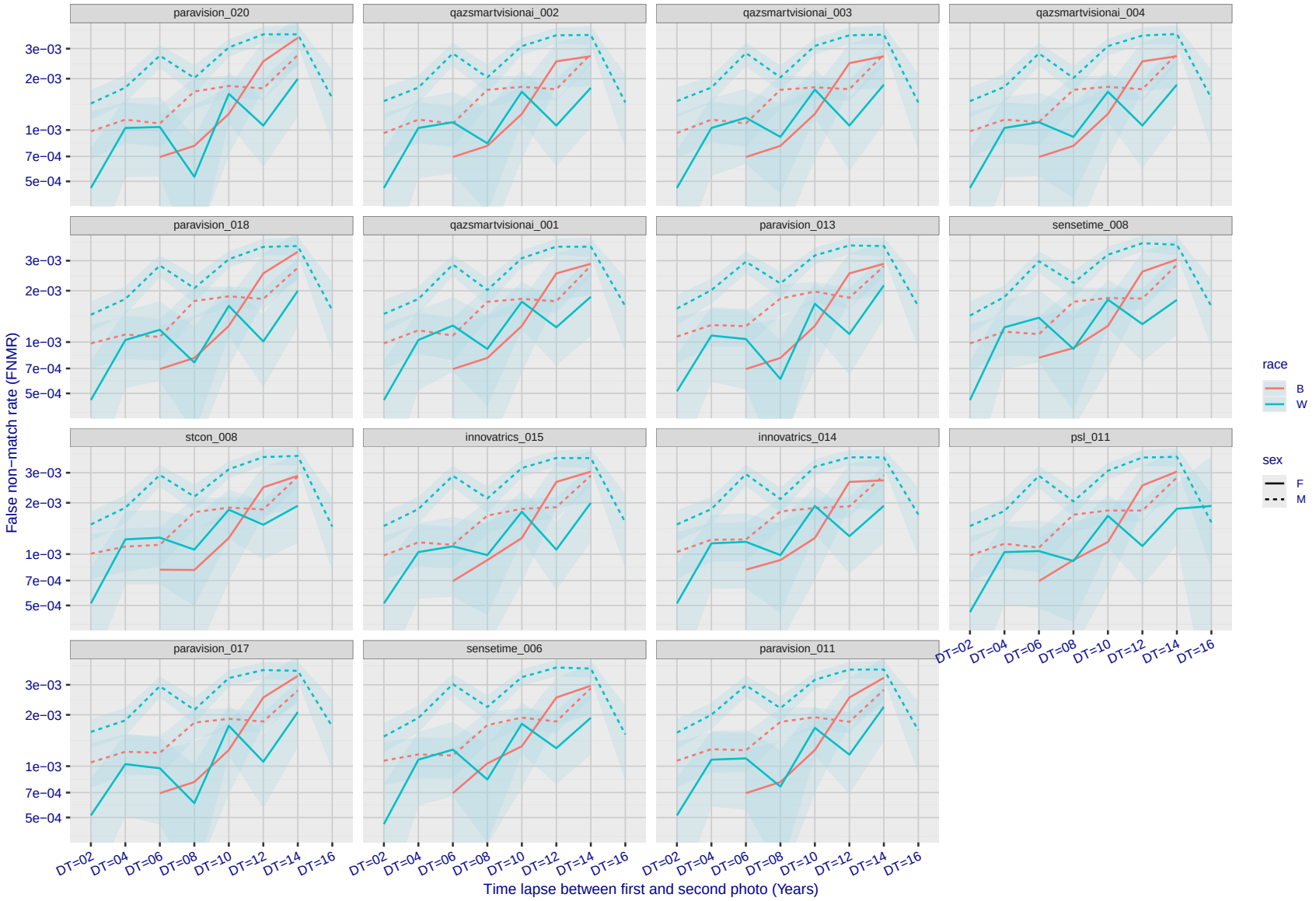

Figure 688: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\bar{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

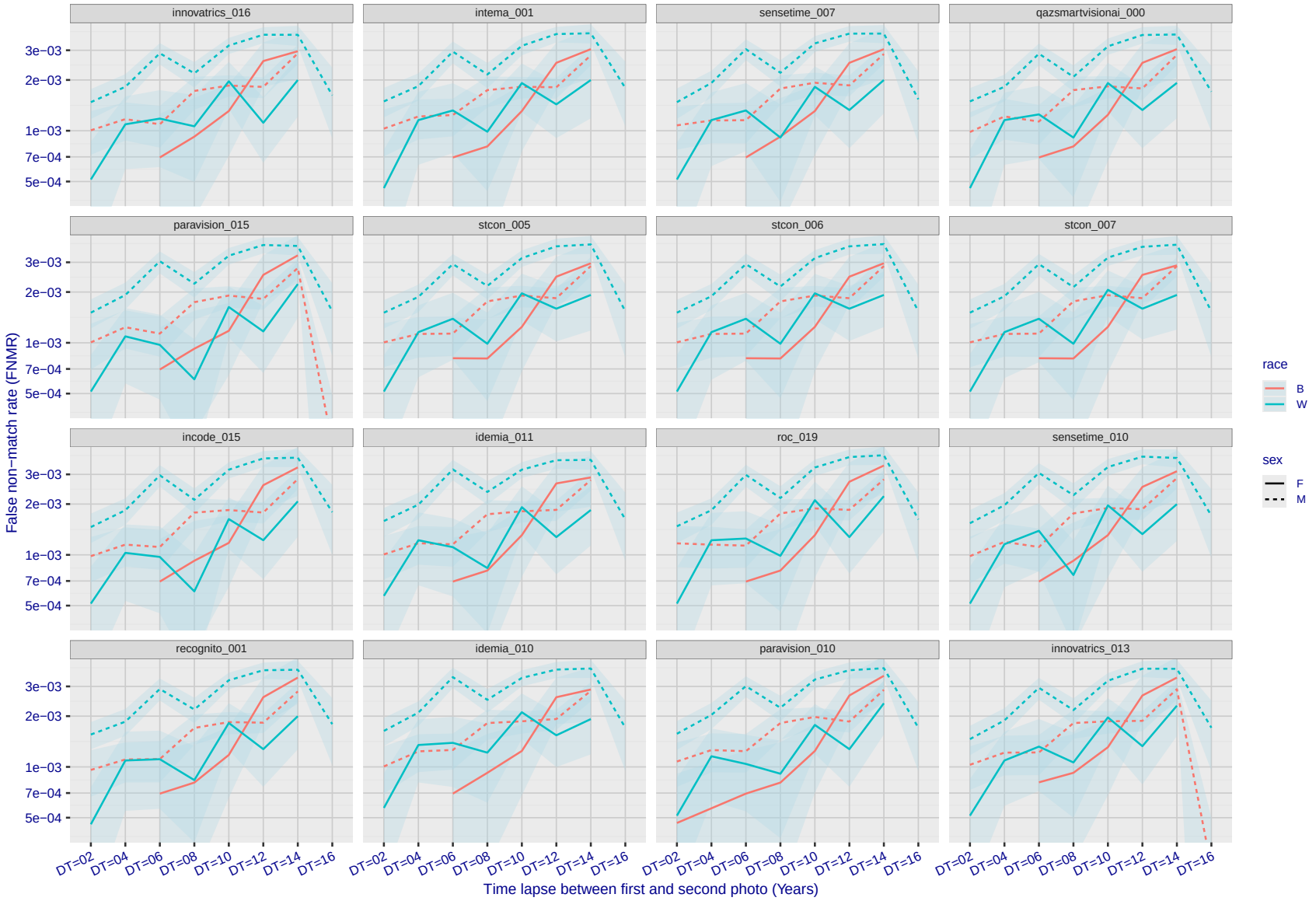

Figure 689: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

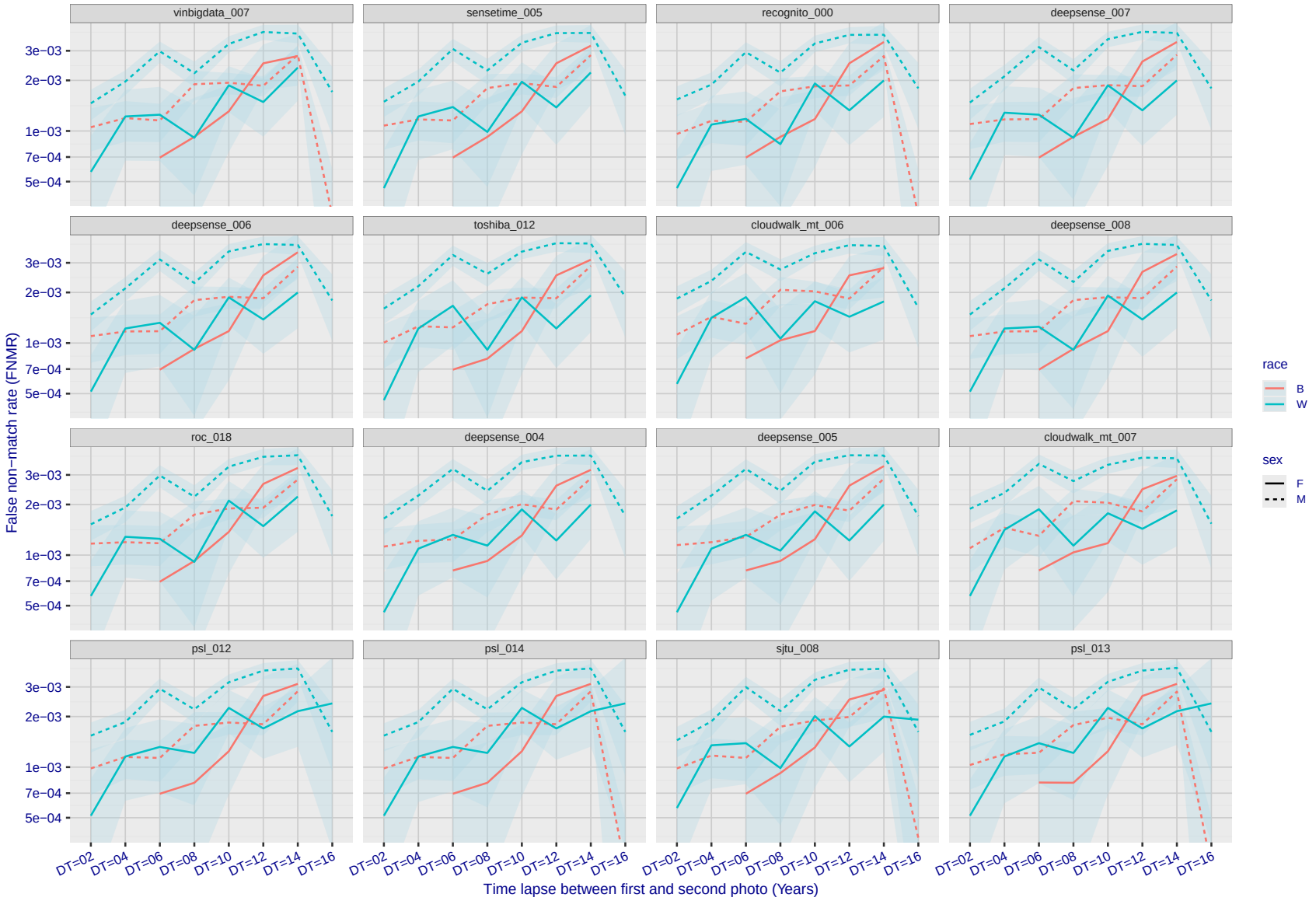

Figure 690: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

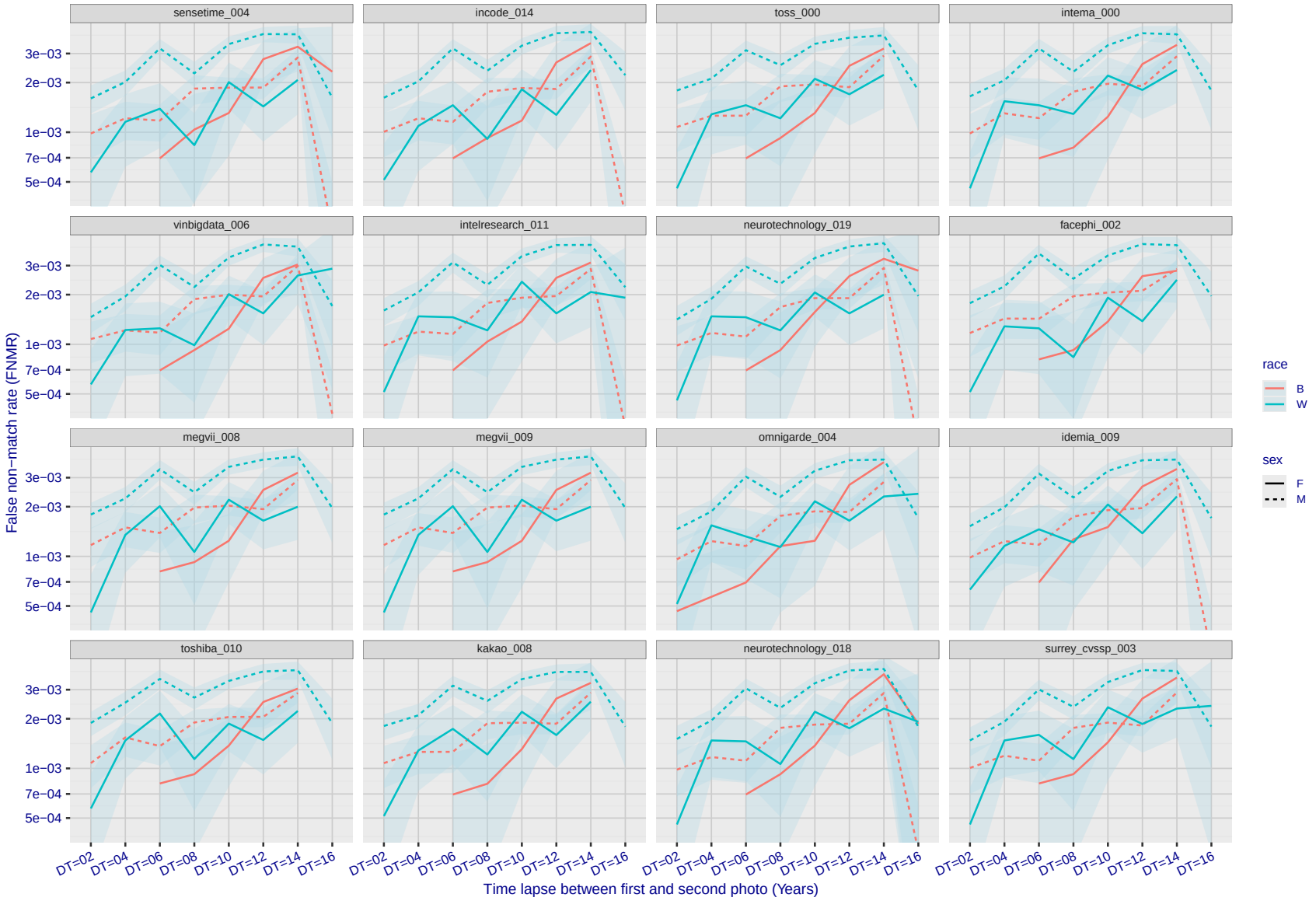

Figure 691: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

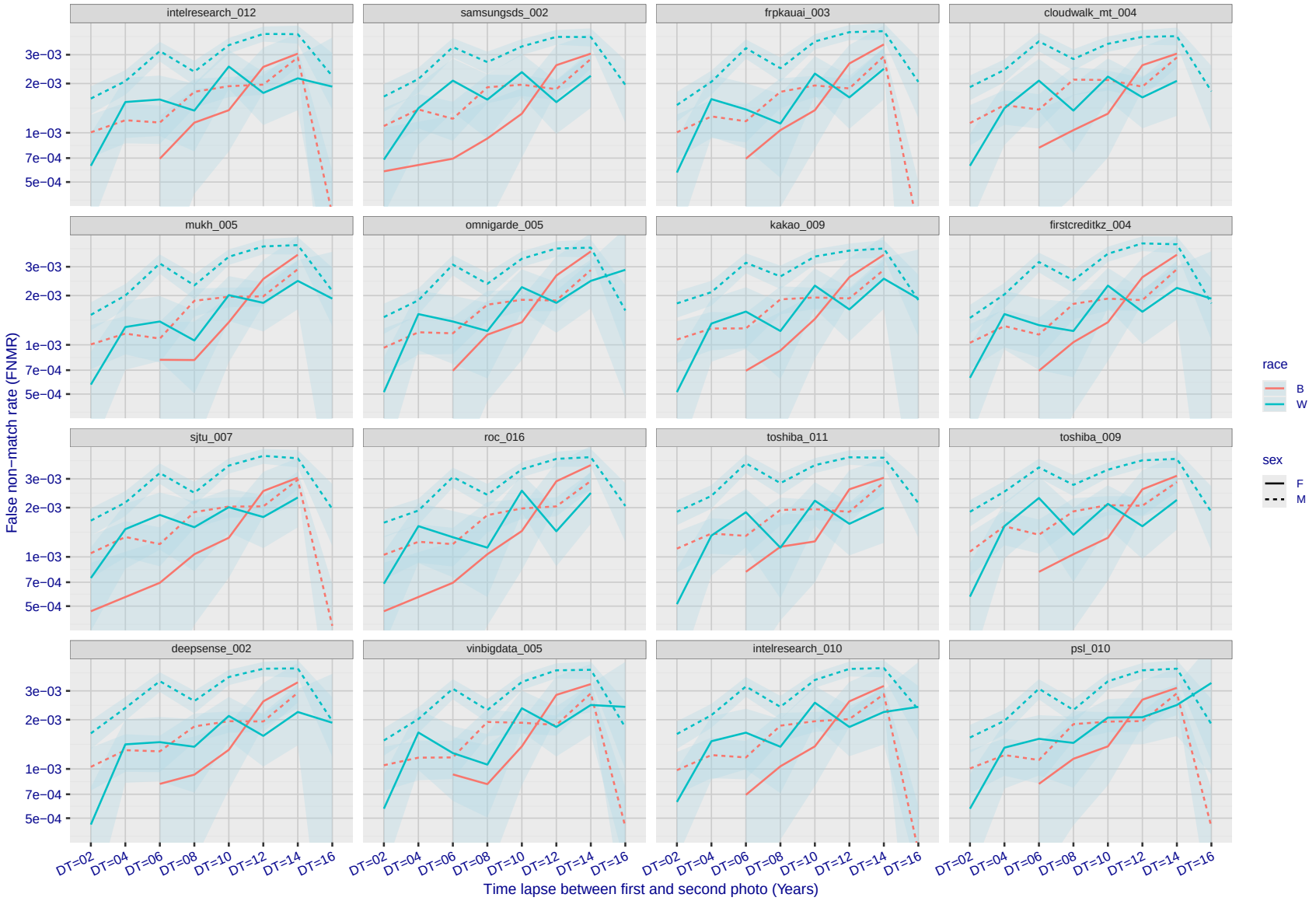

Figure 692: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

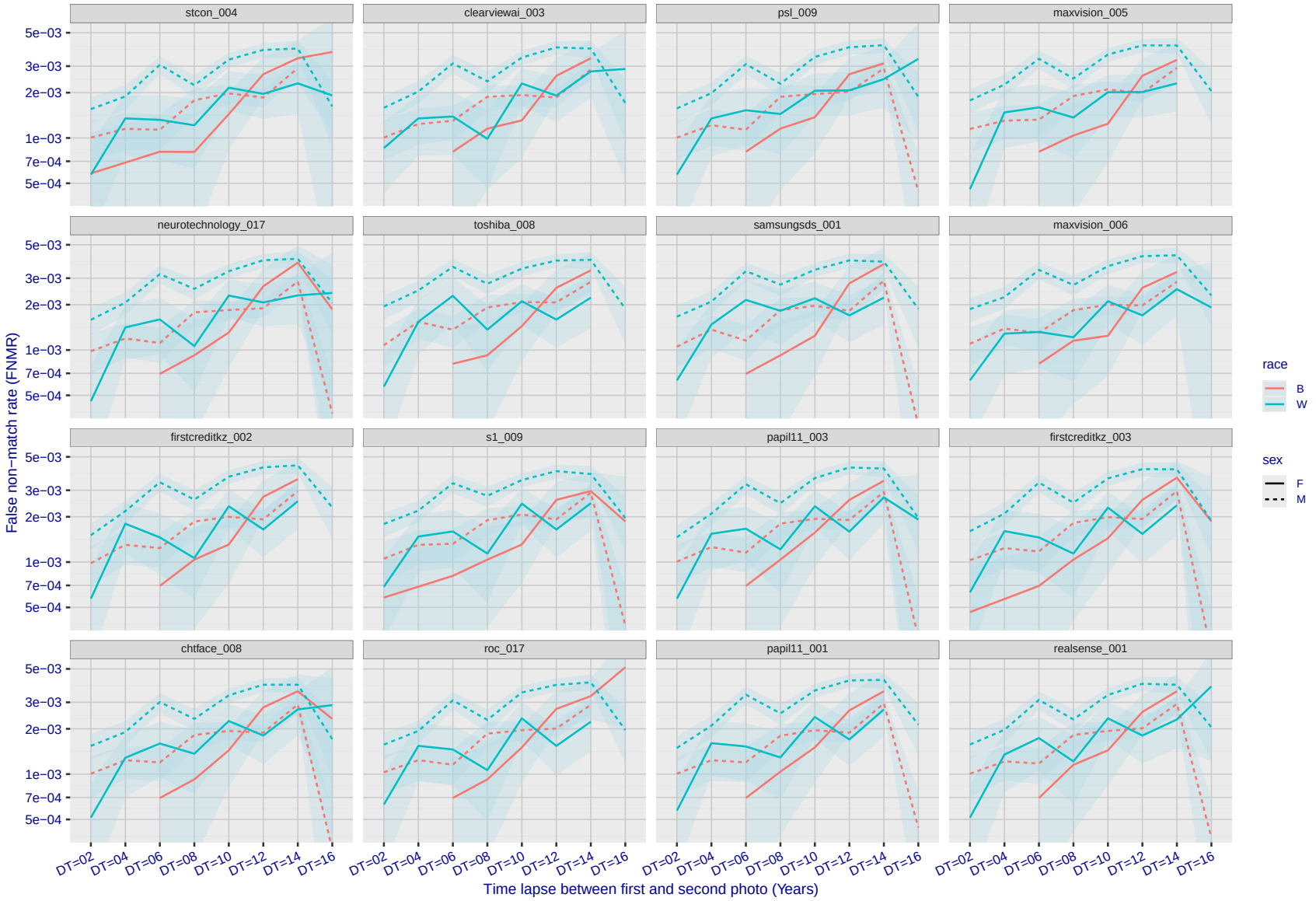

Figure 693: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

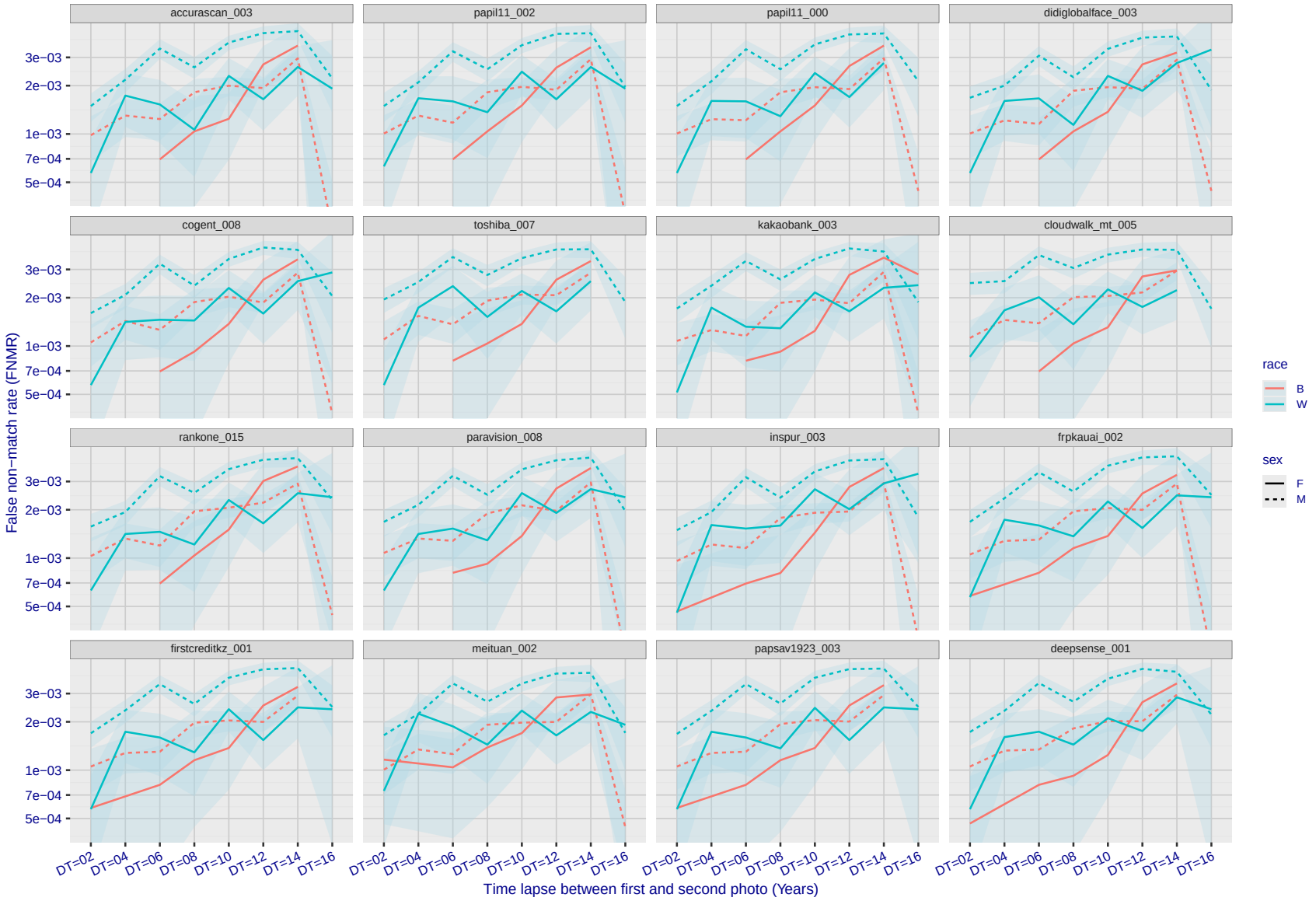

Figure 694: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

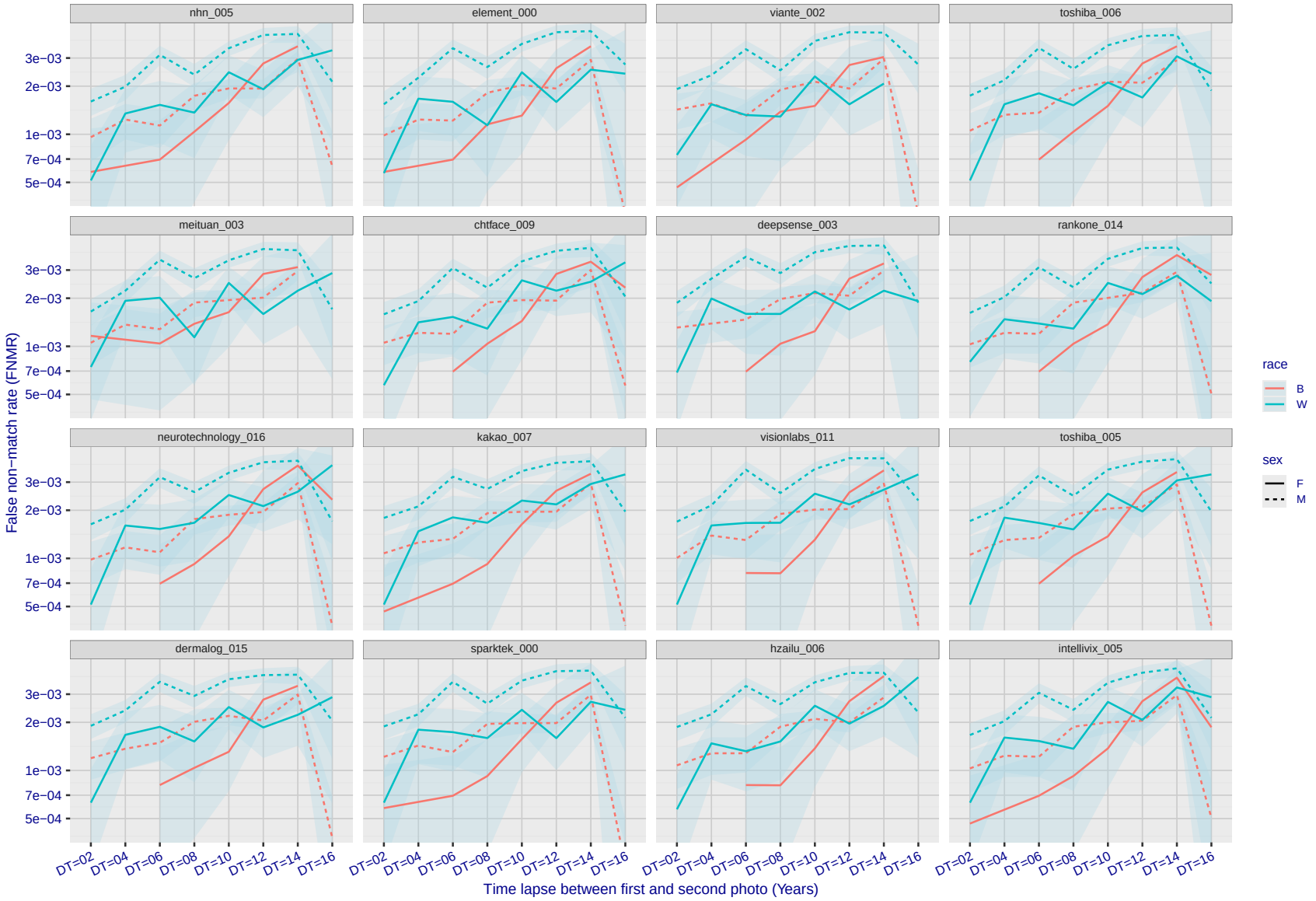

Figure 695: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

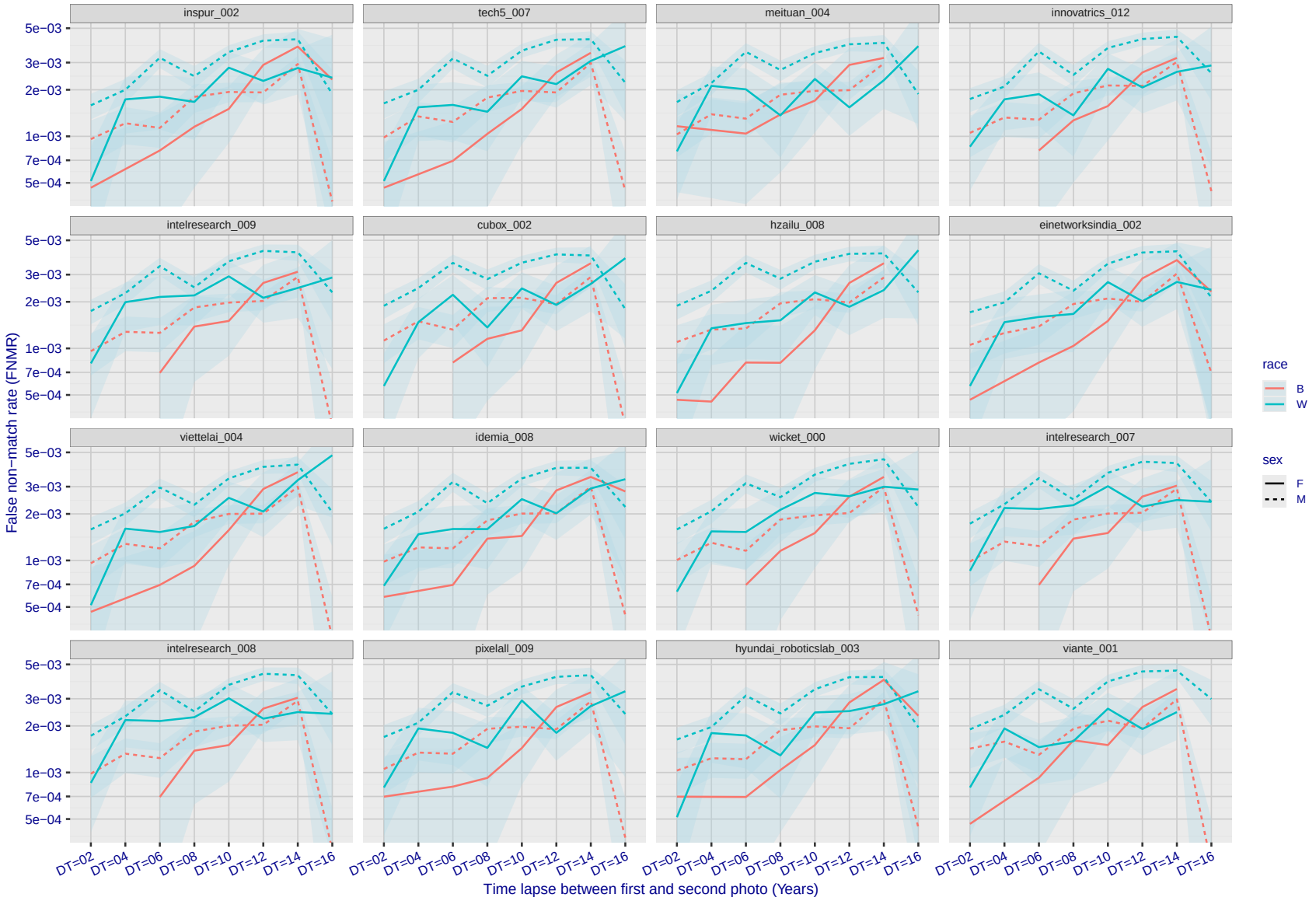

Figure 696: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

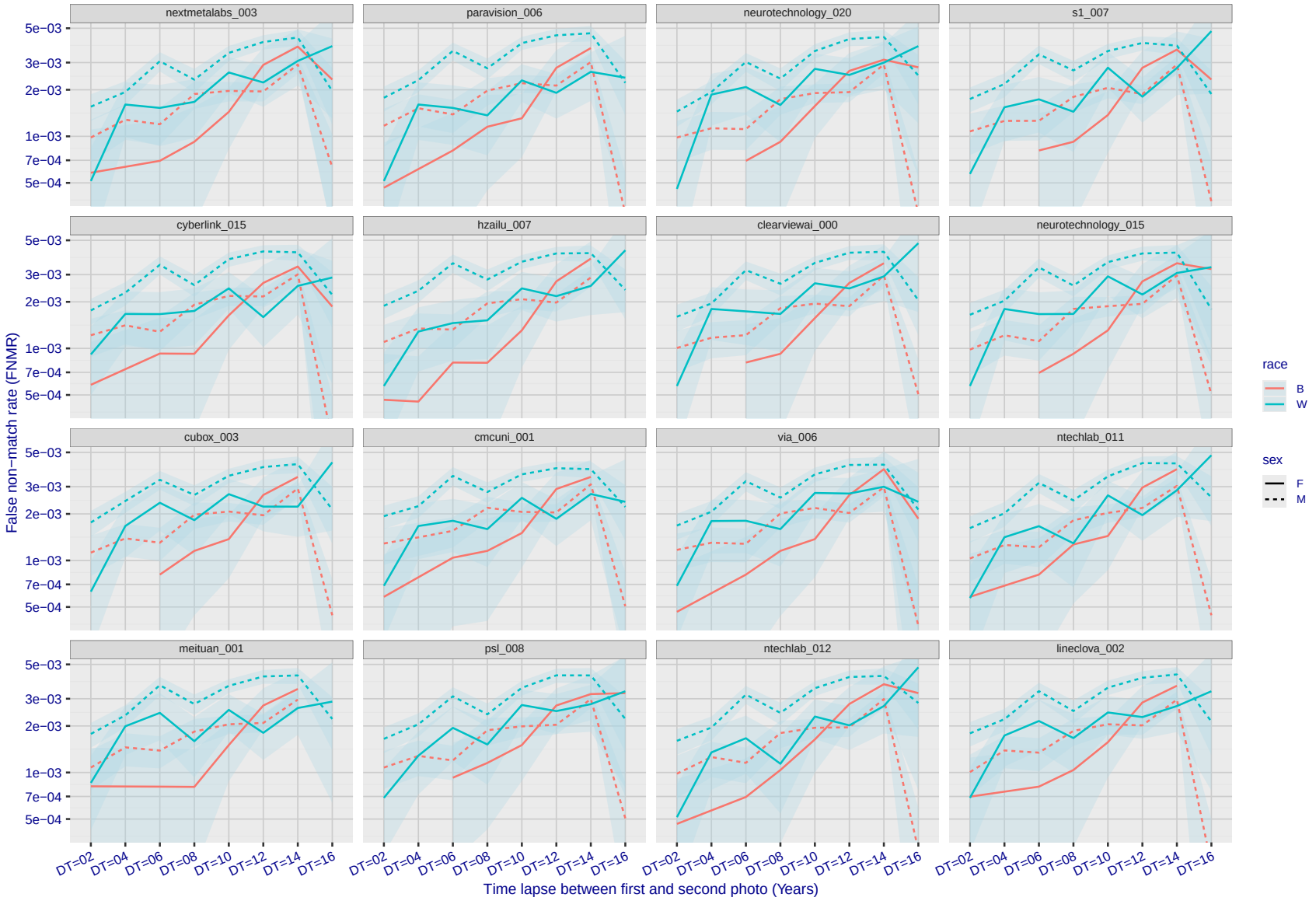

Figure 697: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

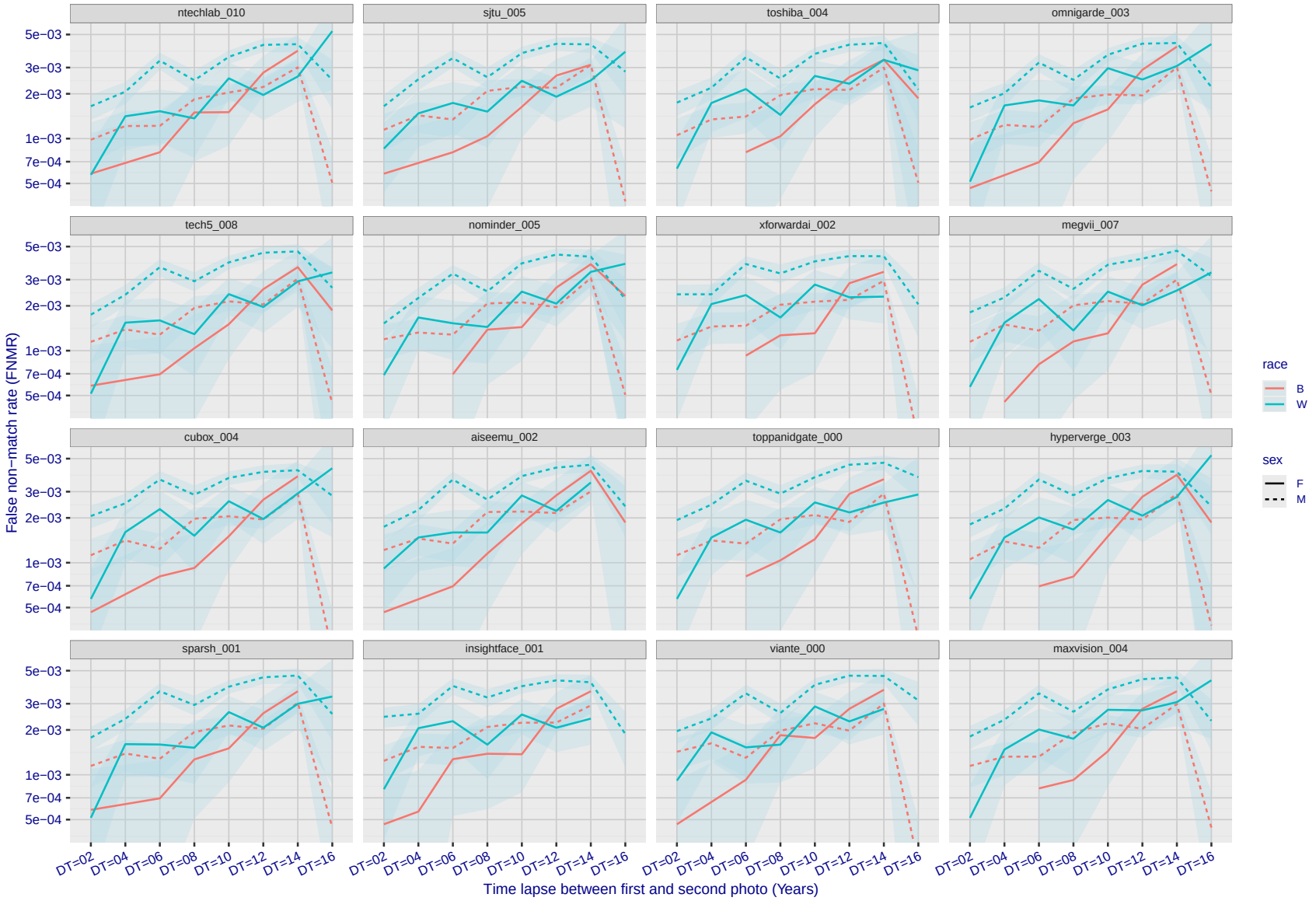

Figure 698: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

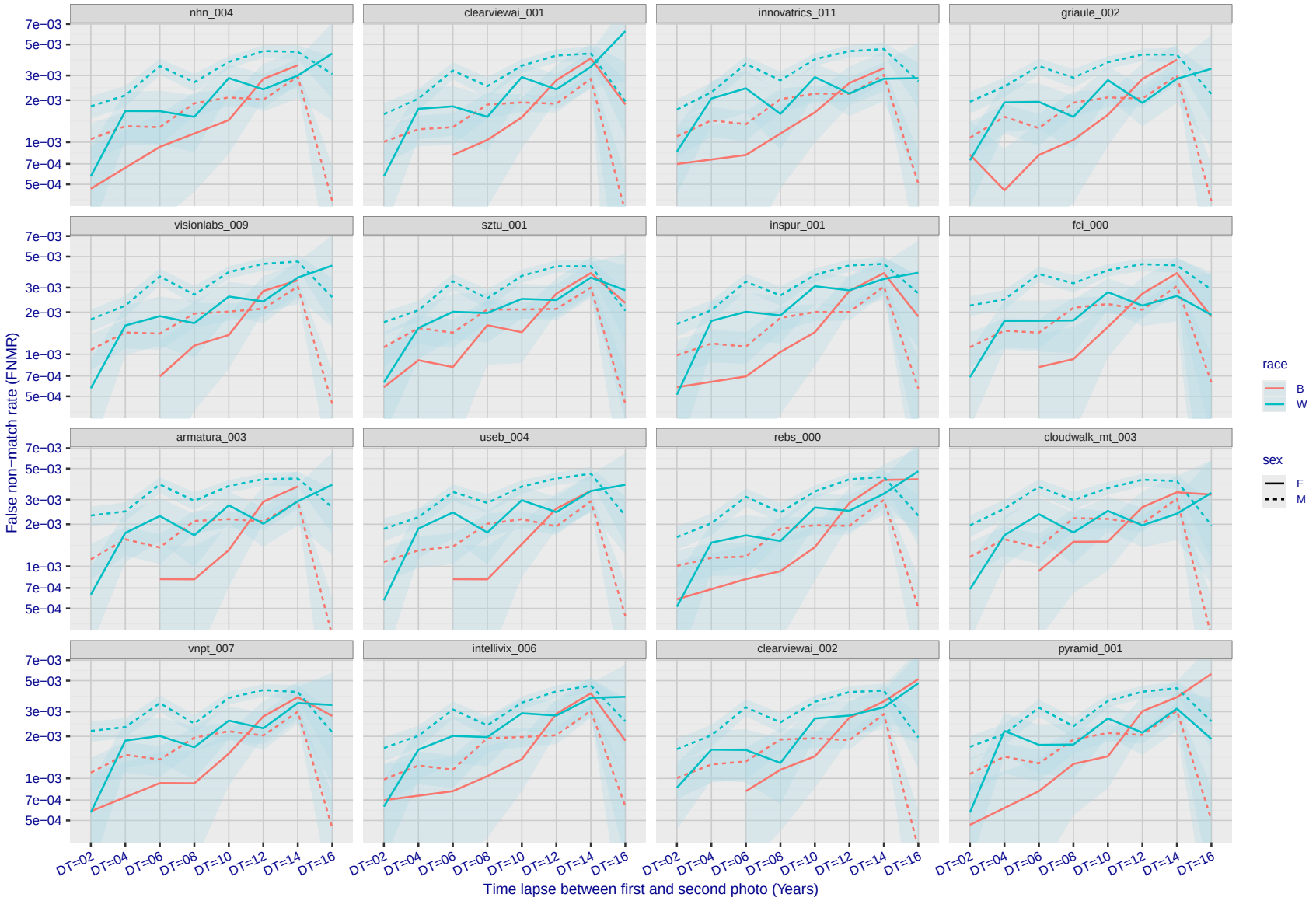

Figure 699: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

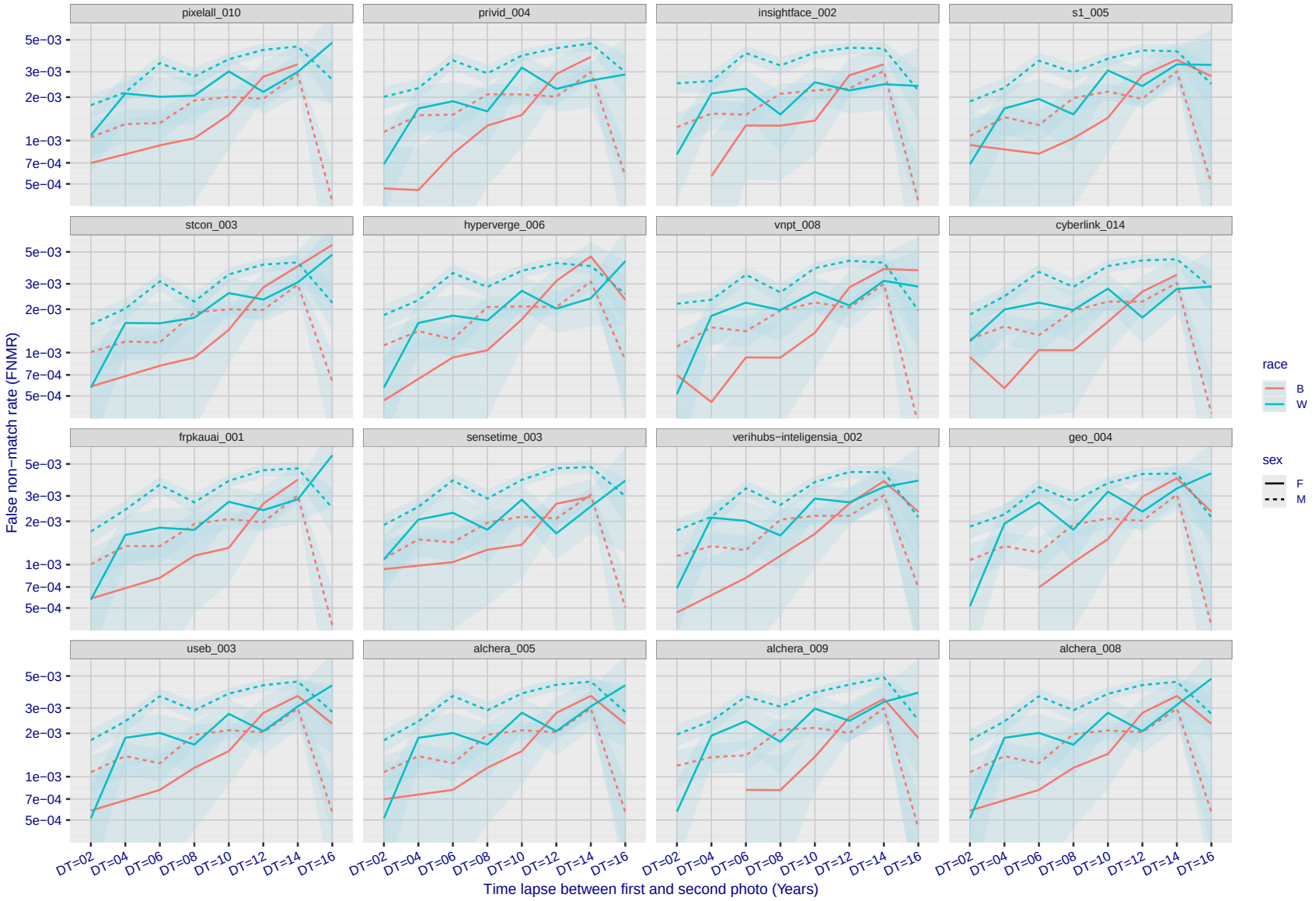

Figure 700: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

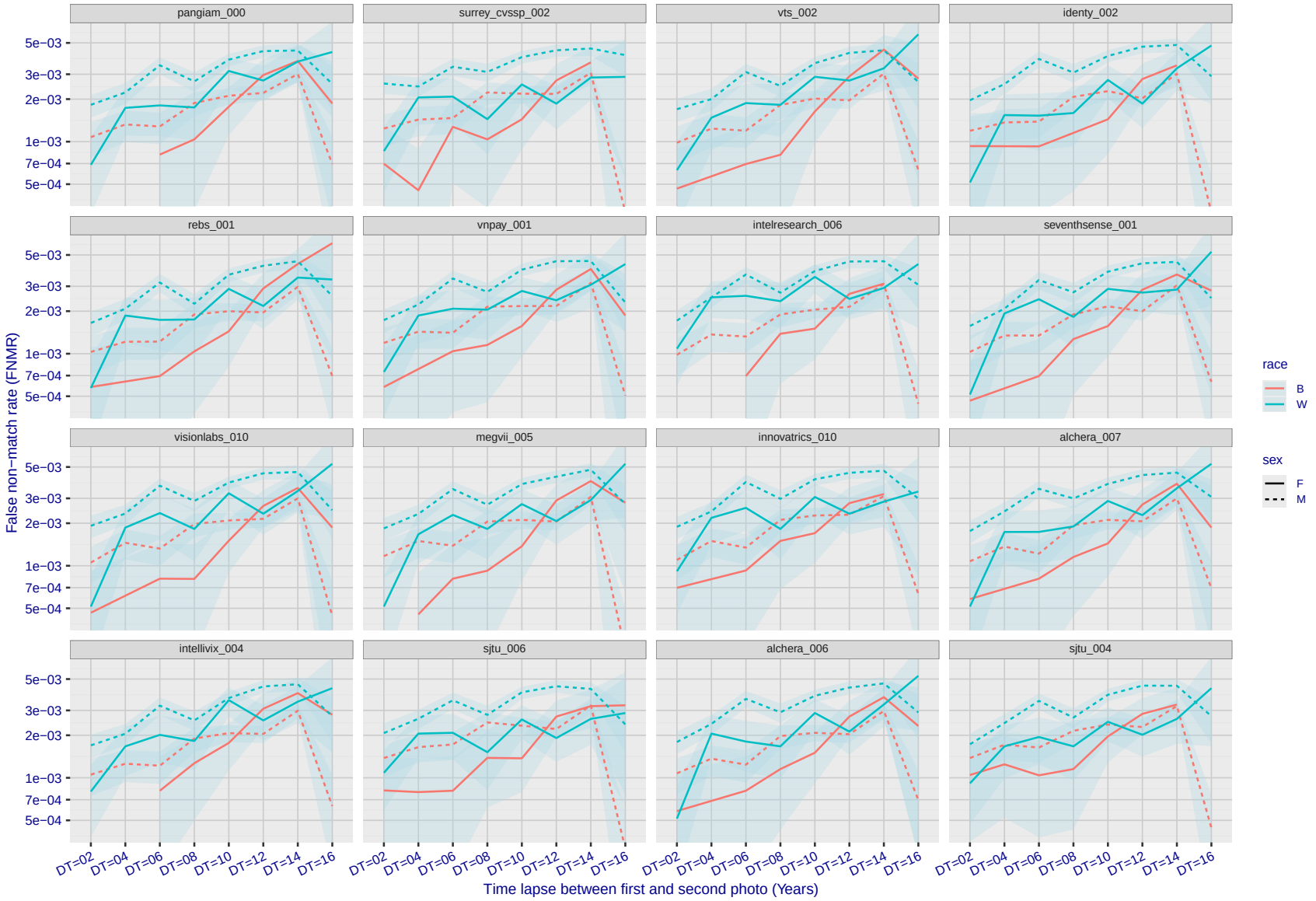

Figure 701: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

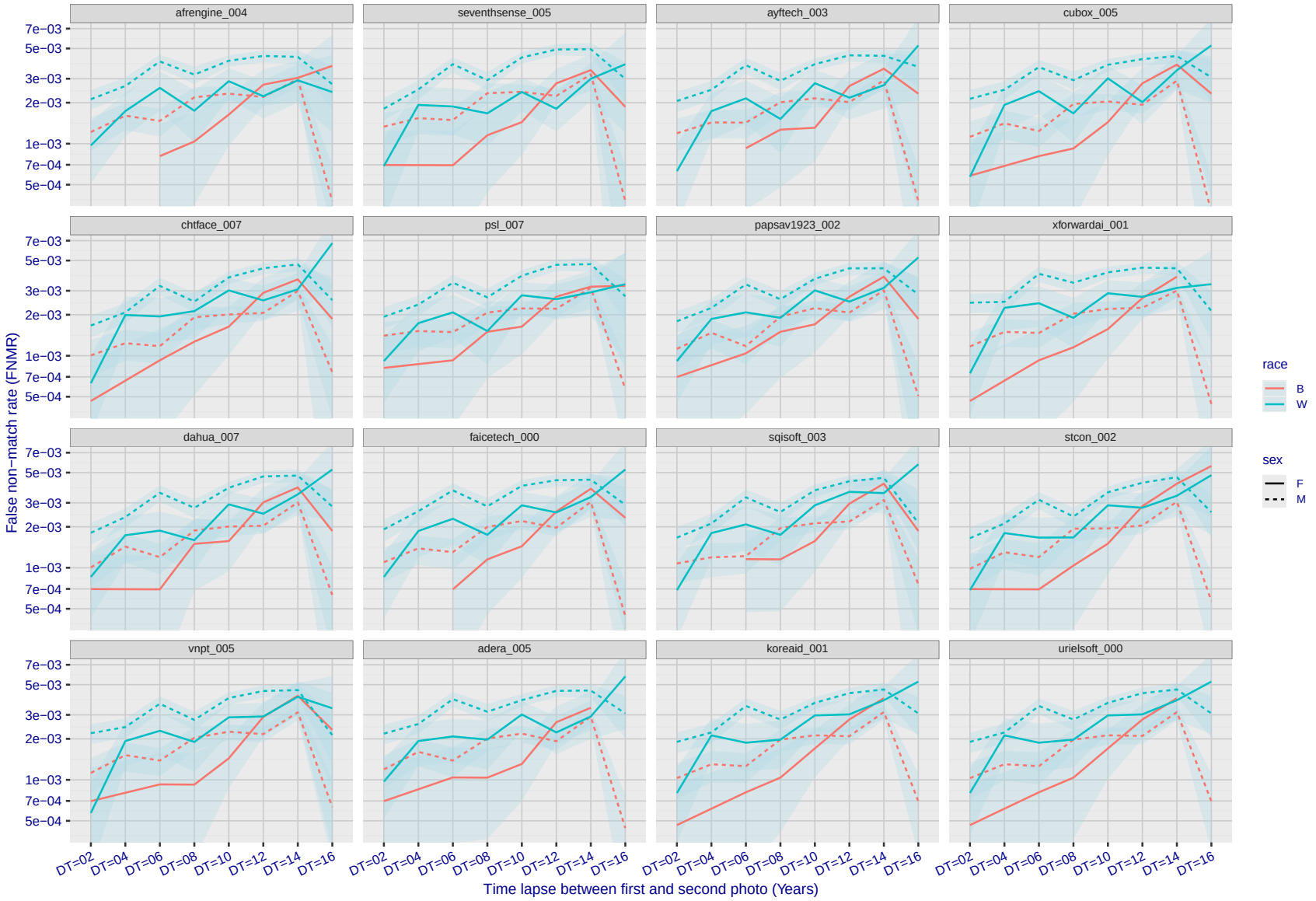

Figure 702: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

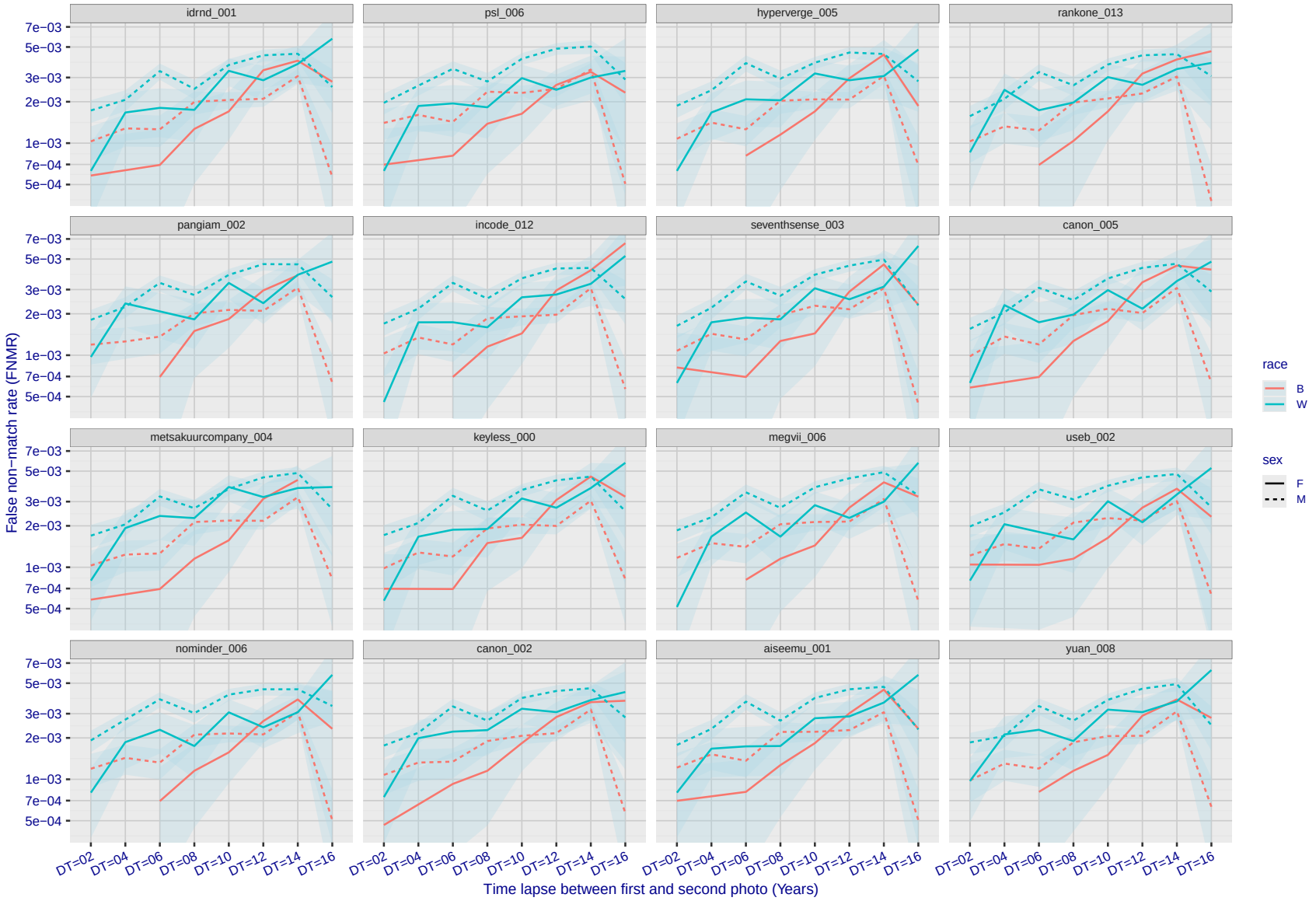

Figure 703: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

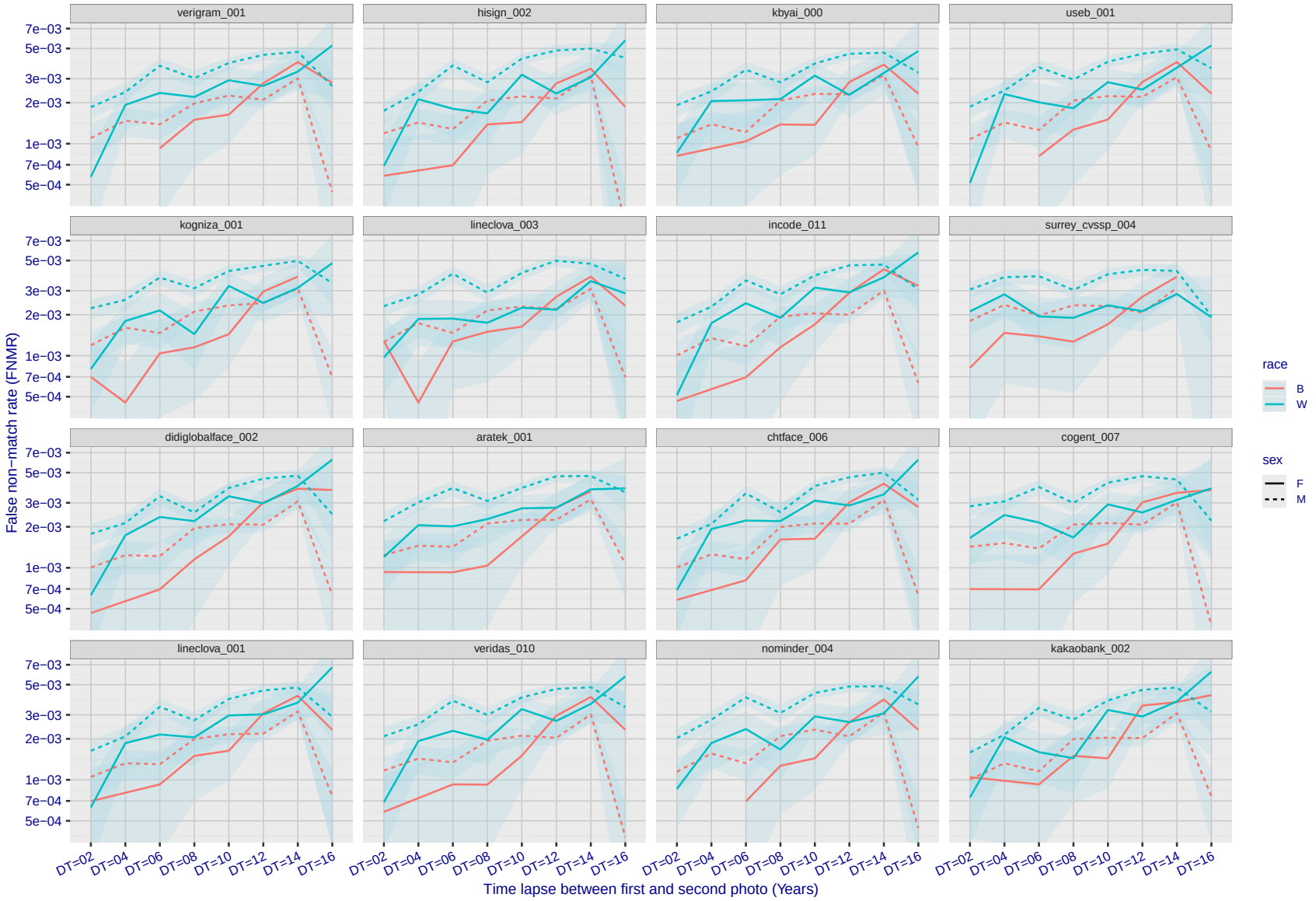

Figure 704: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

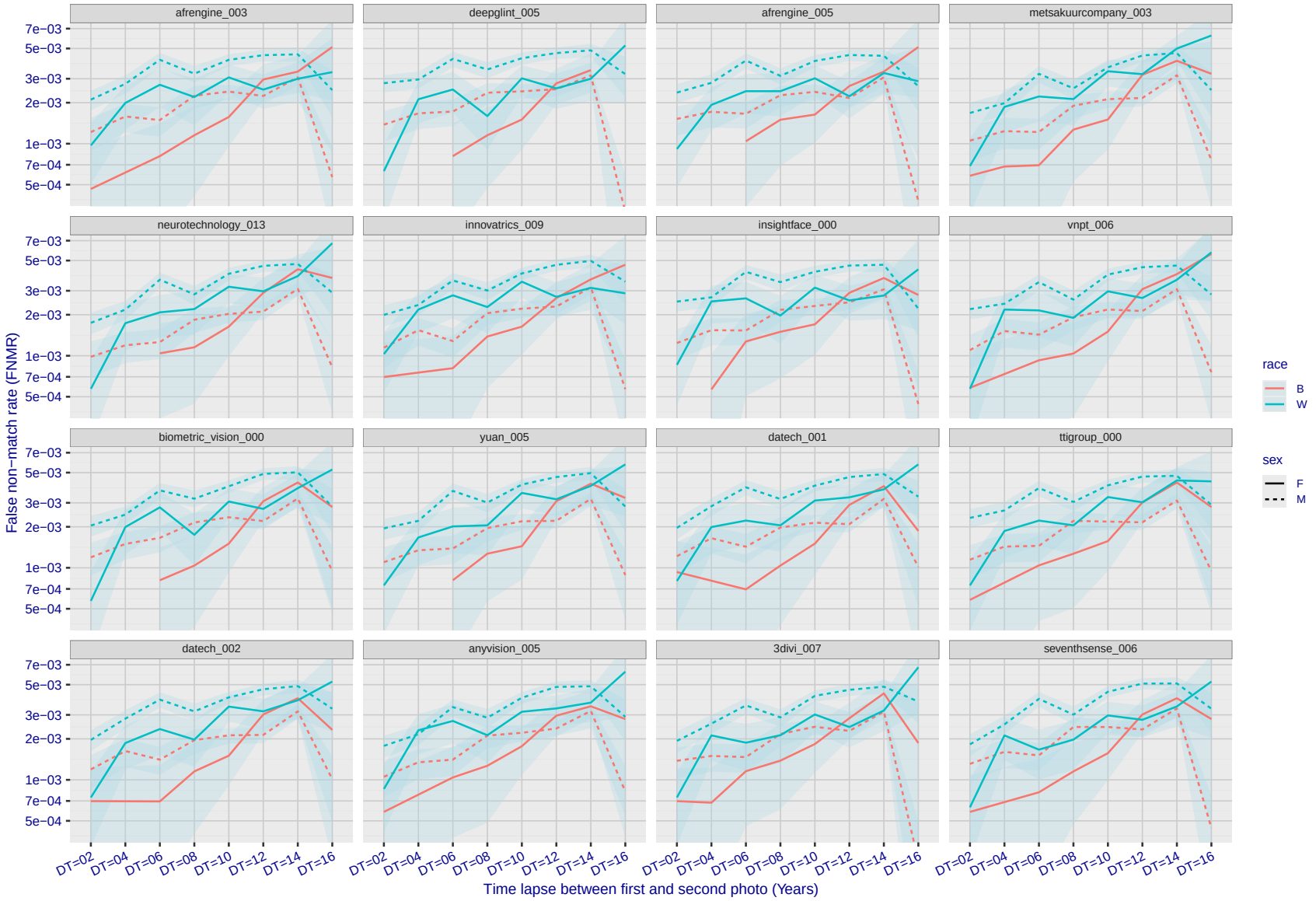

Figure 705: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

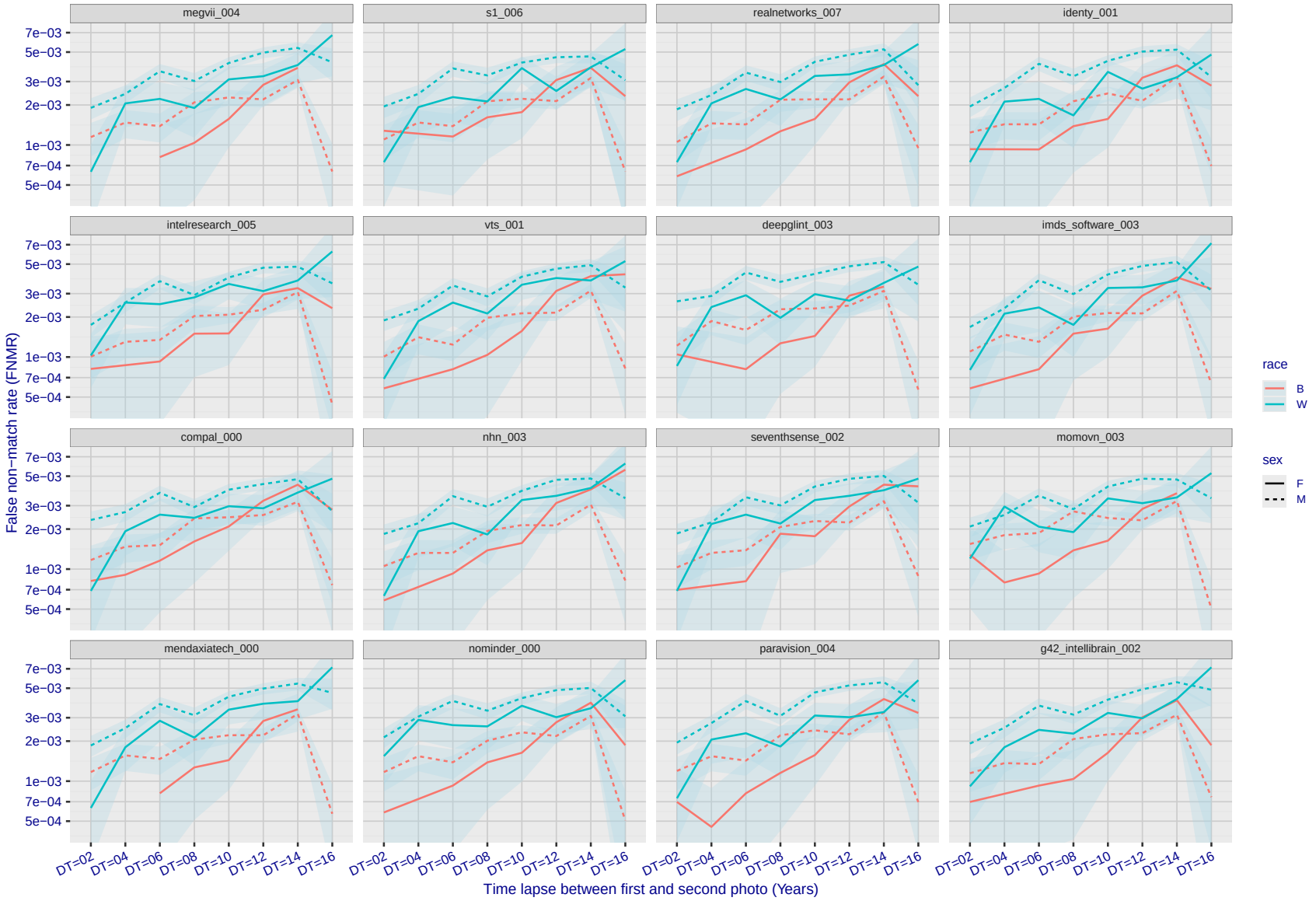

Figure 706: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\bar{1}0^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

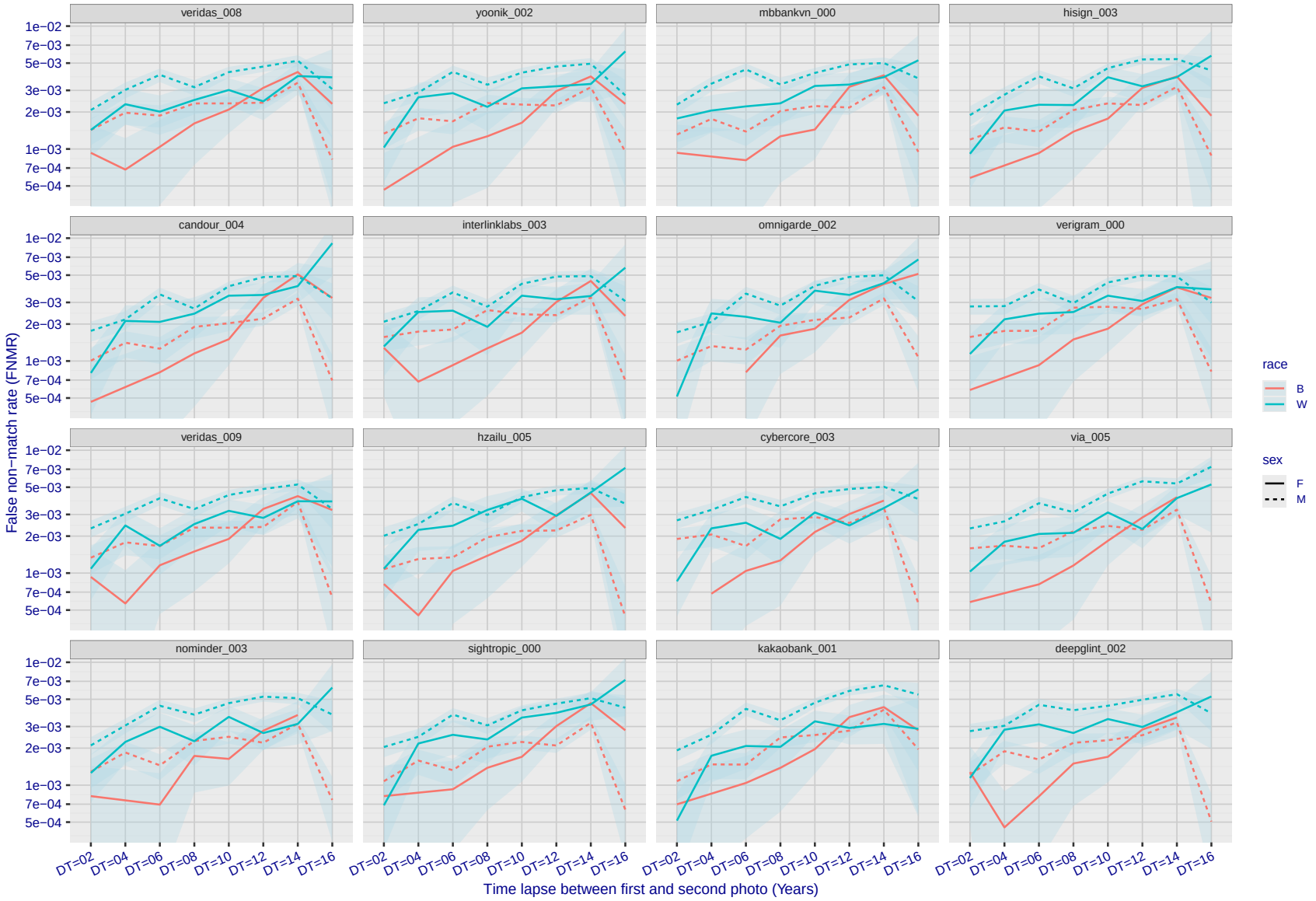

Figure 707: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

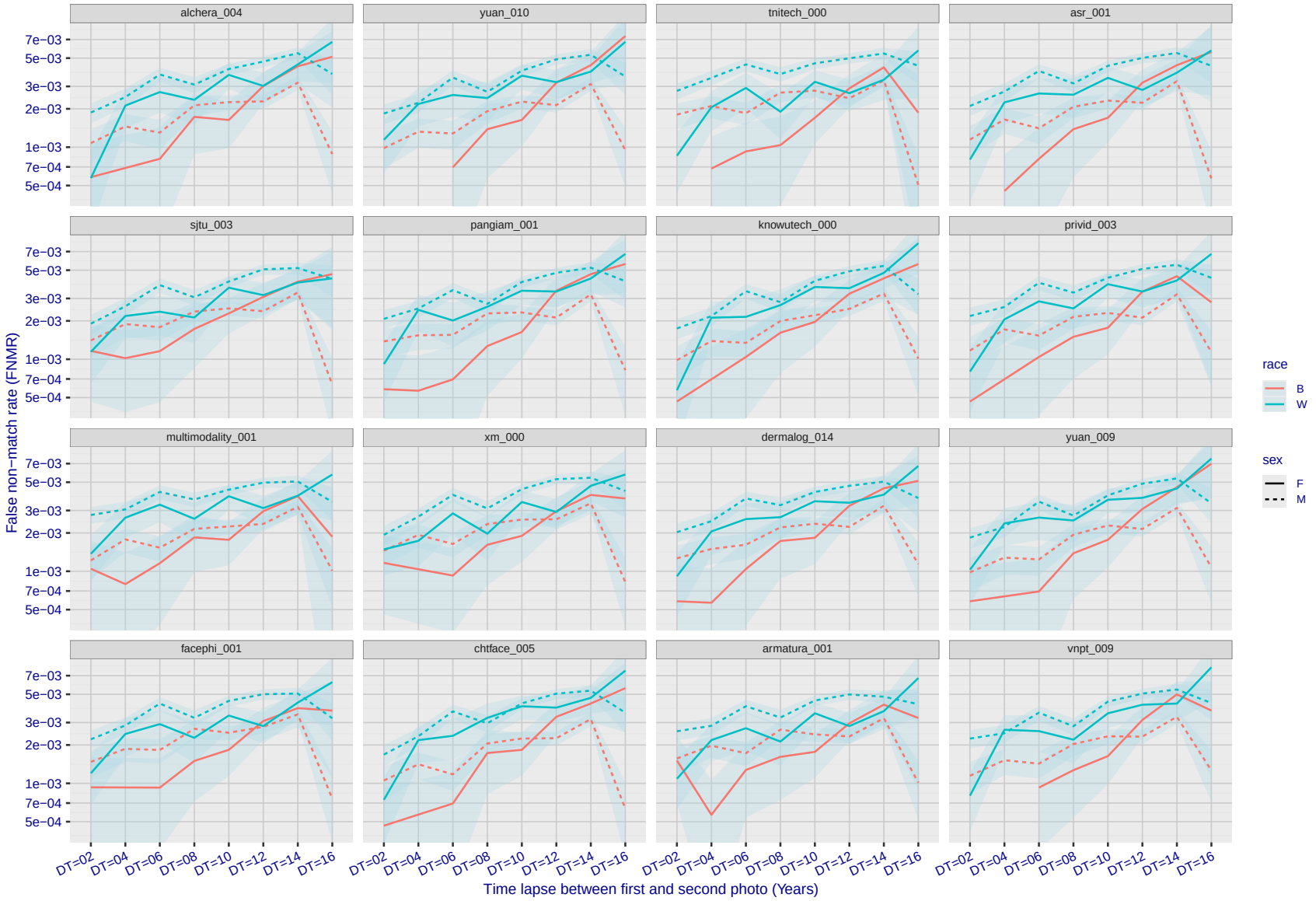

Figure 708: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

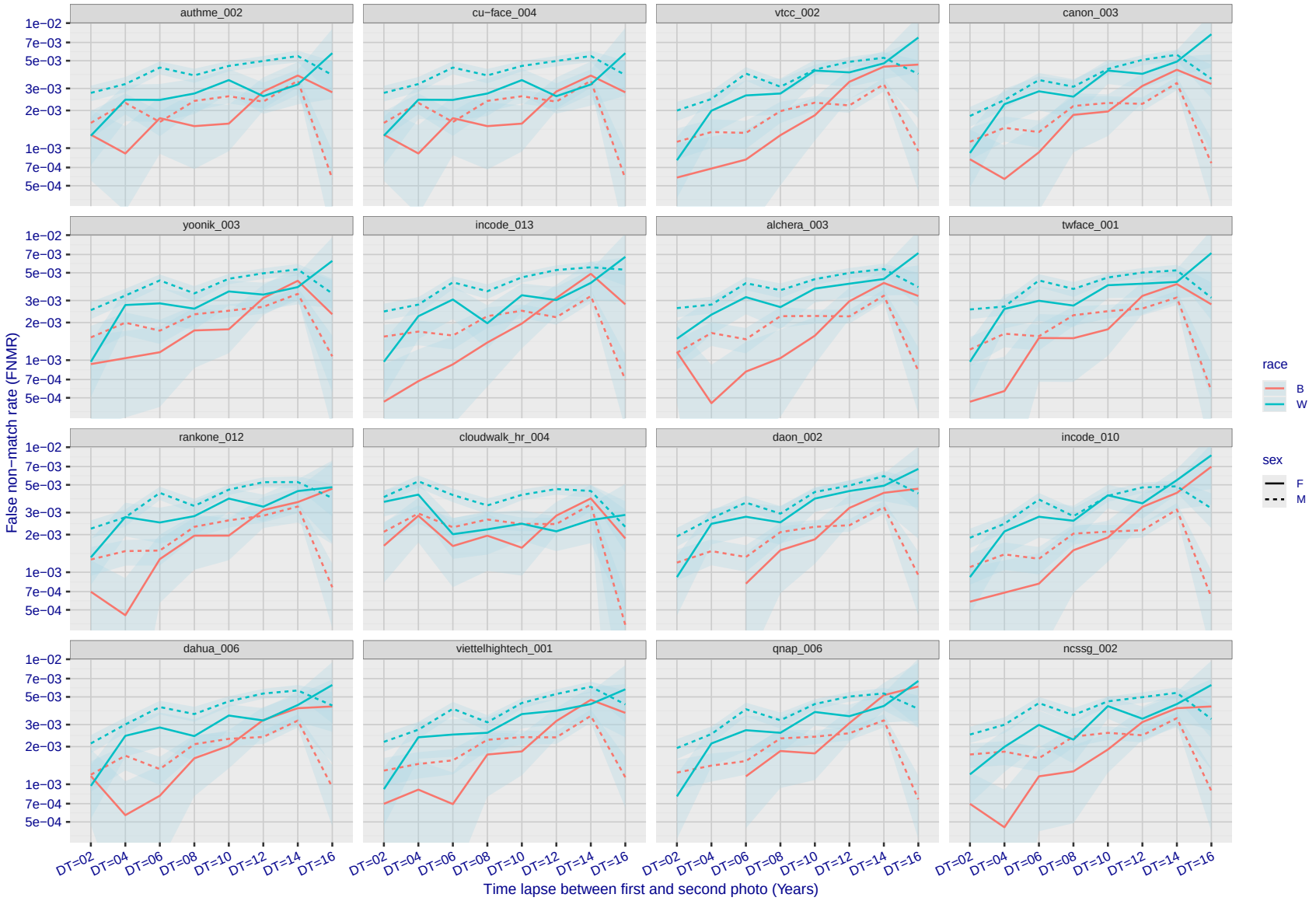

Figure 709: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

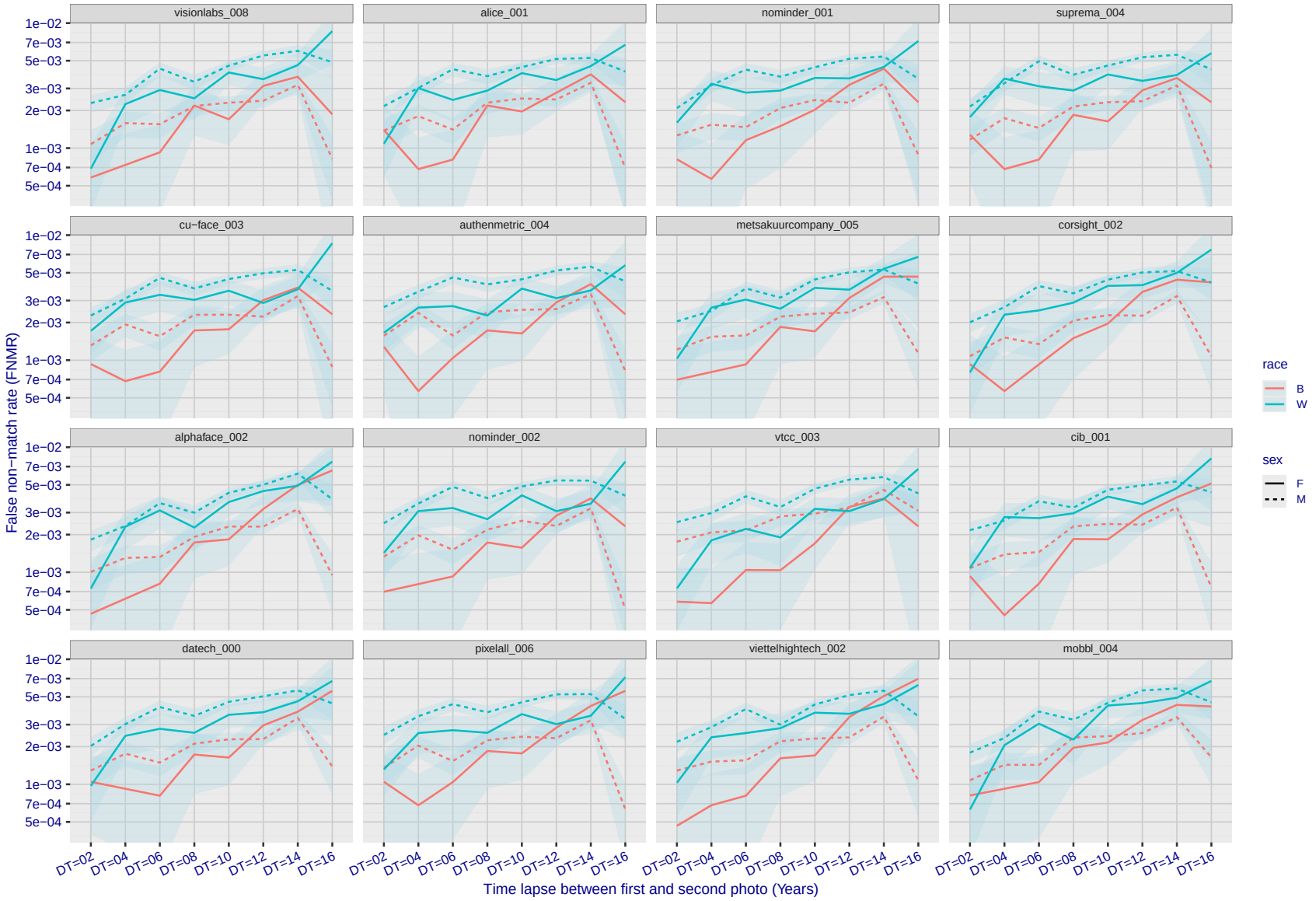

Figure 710: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

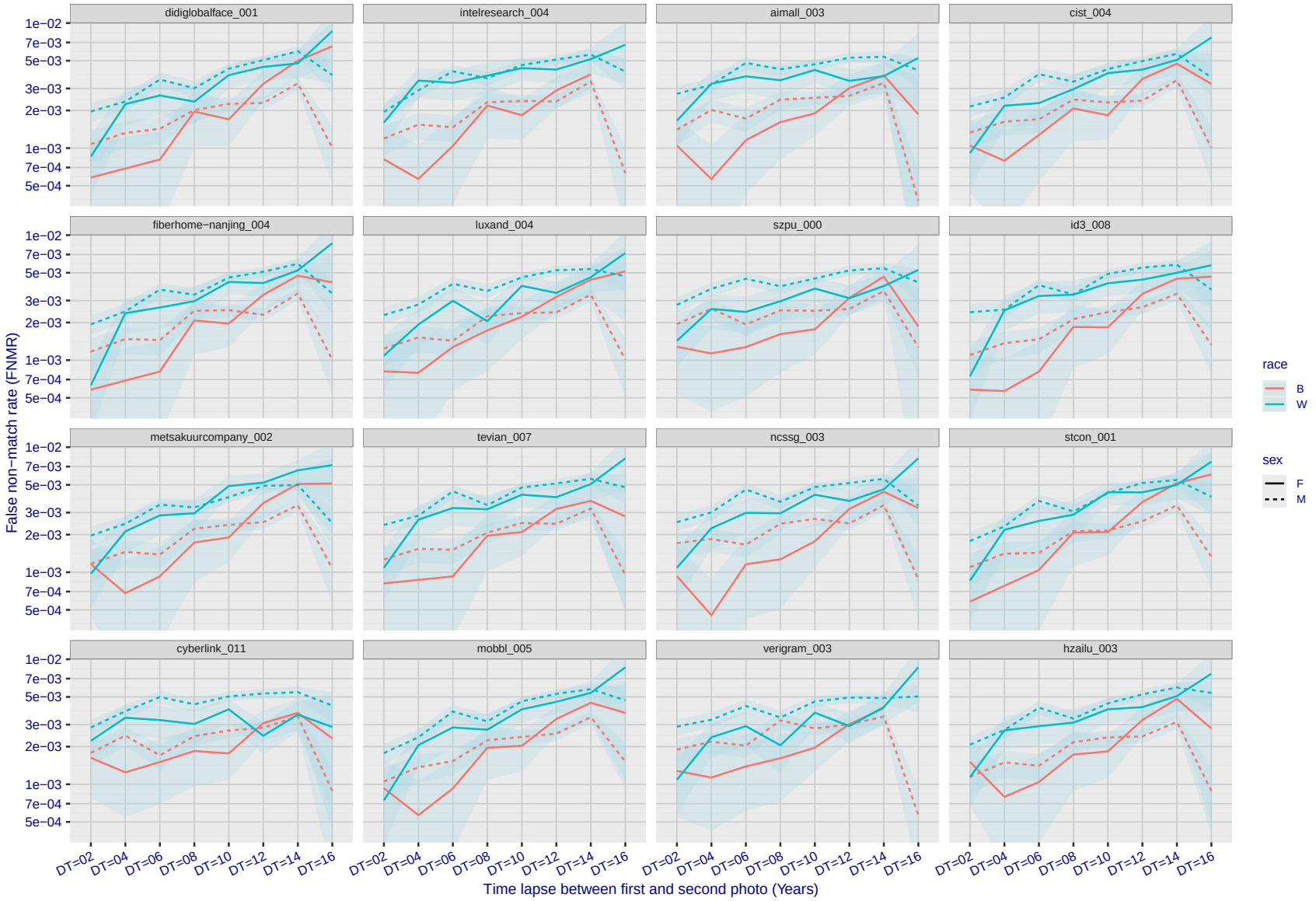

Figure 711: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

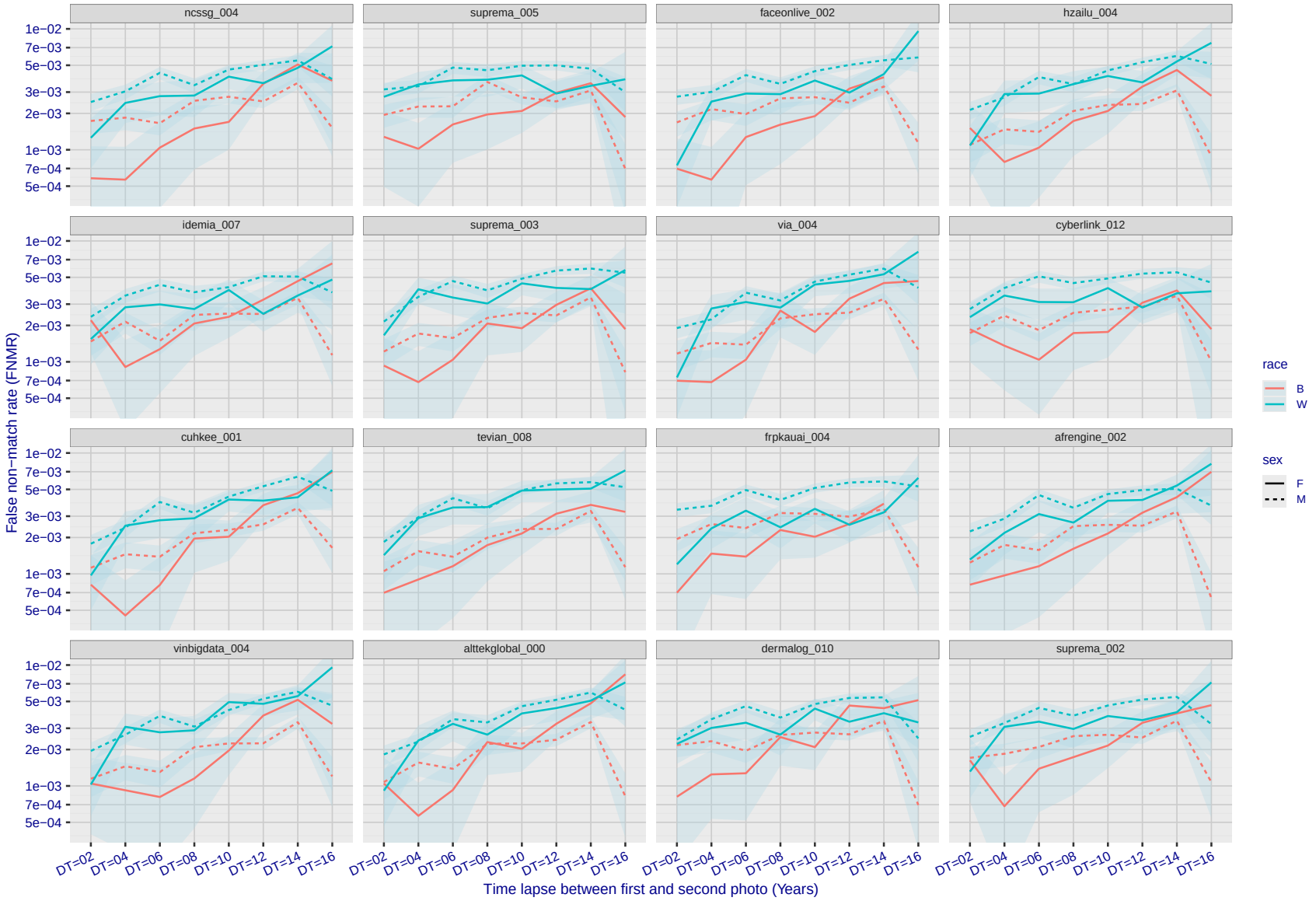

Figure 712: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

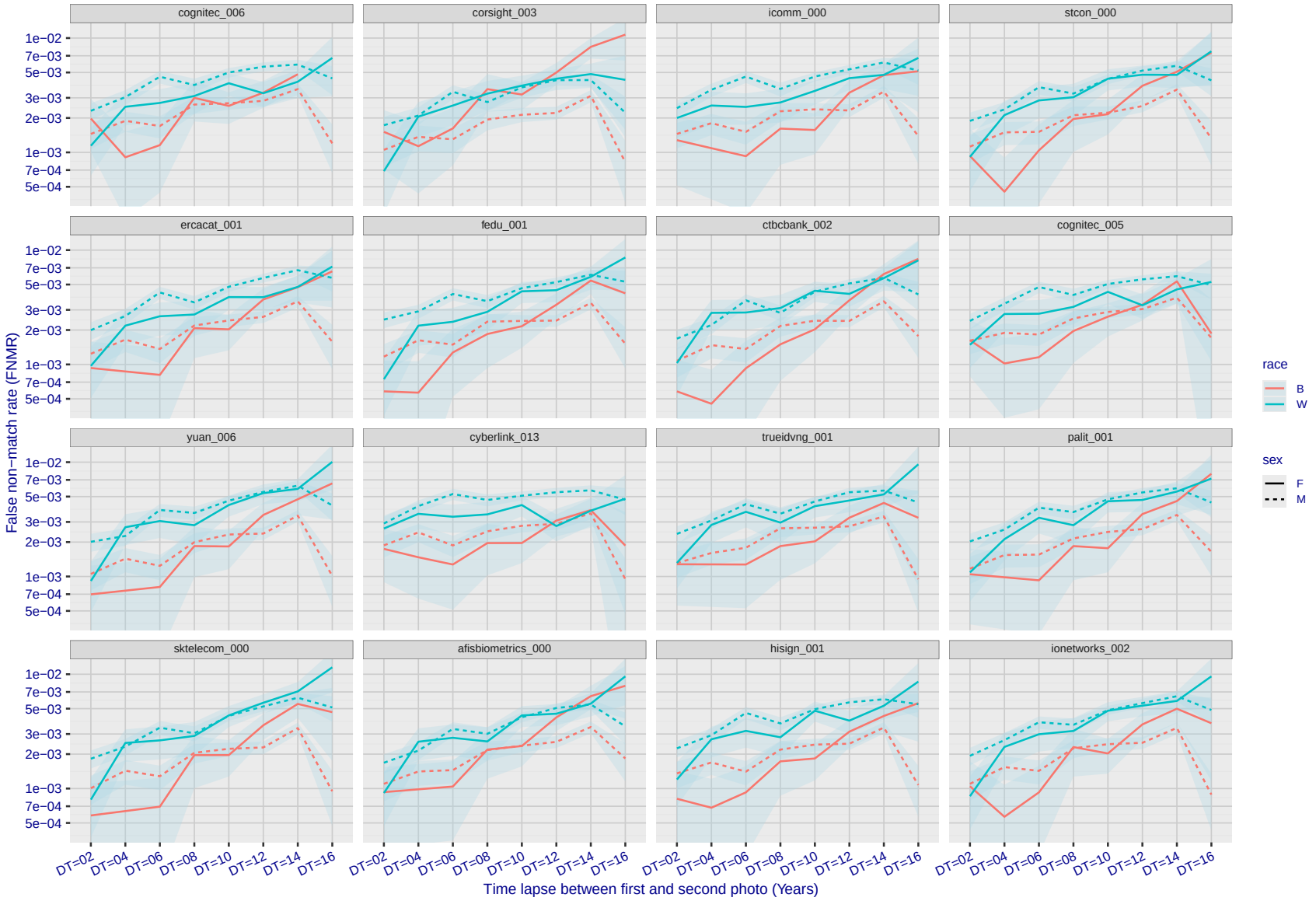

Figure 713: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

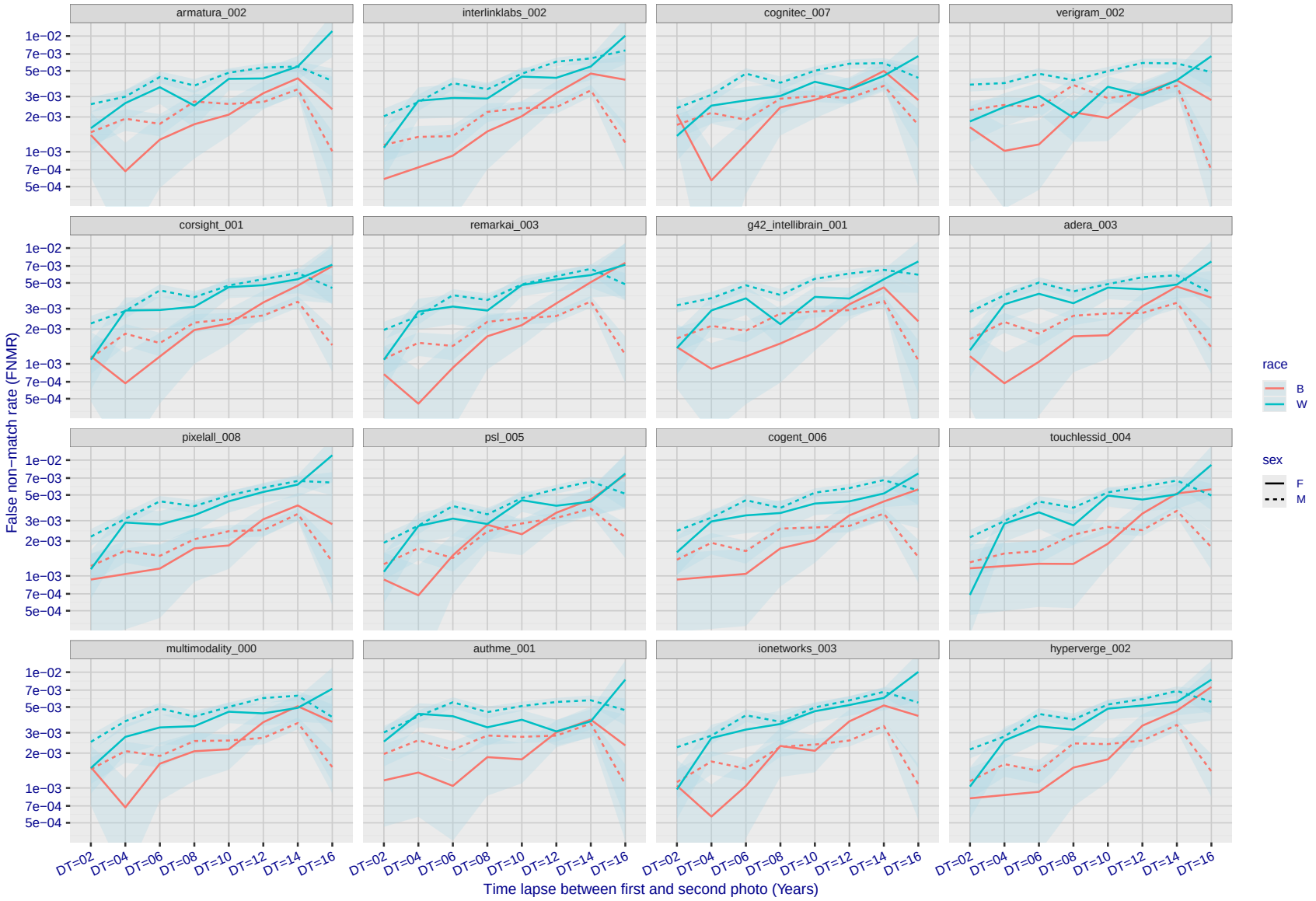

Figure 714: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widehat{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

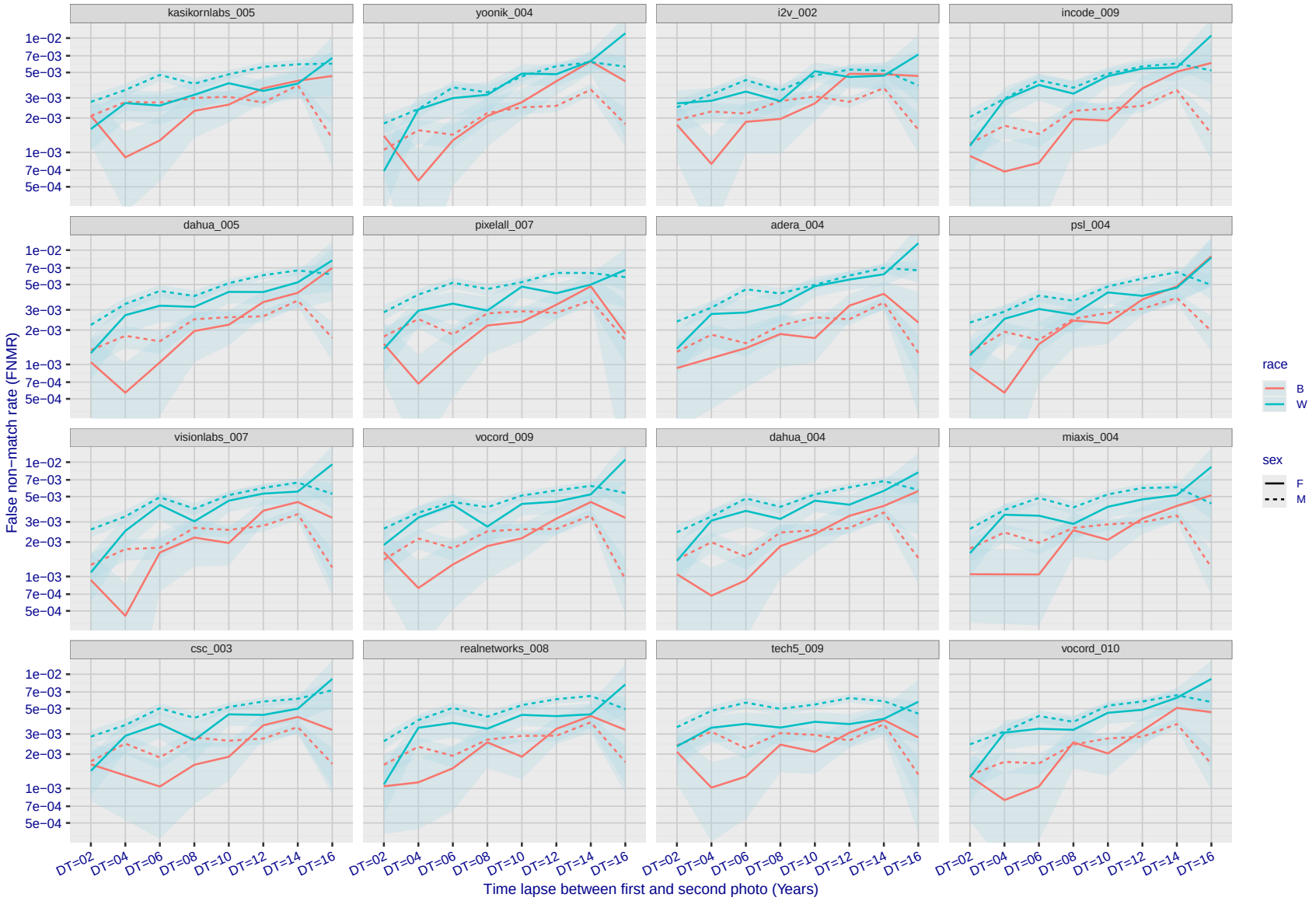

Figure 715: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

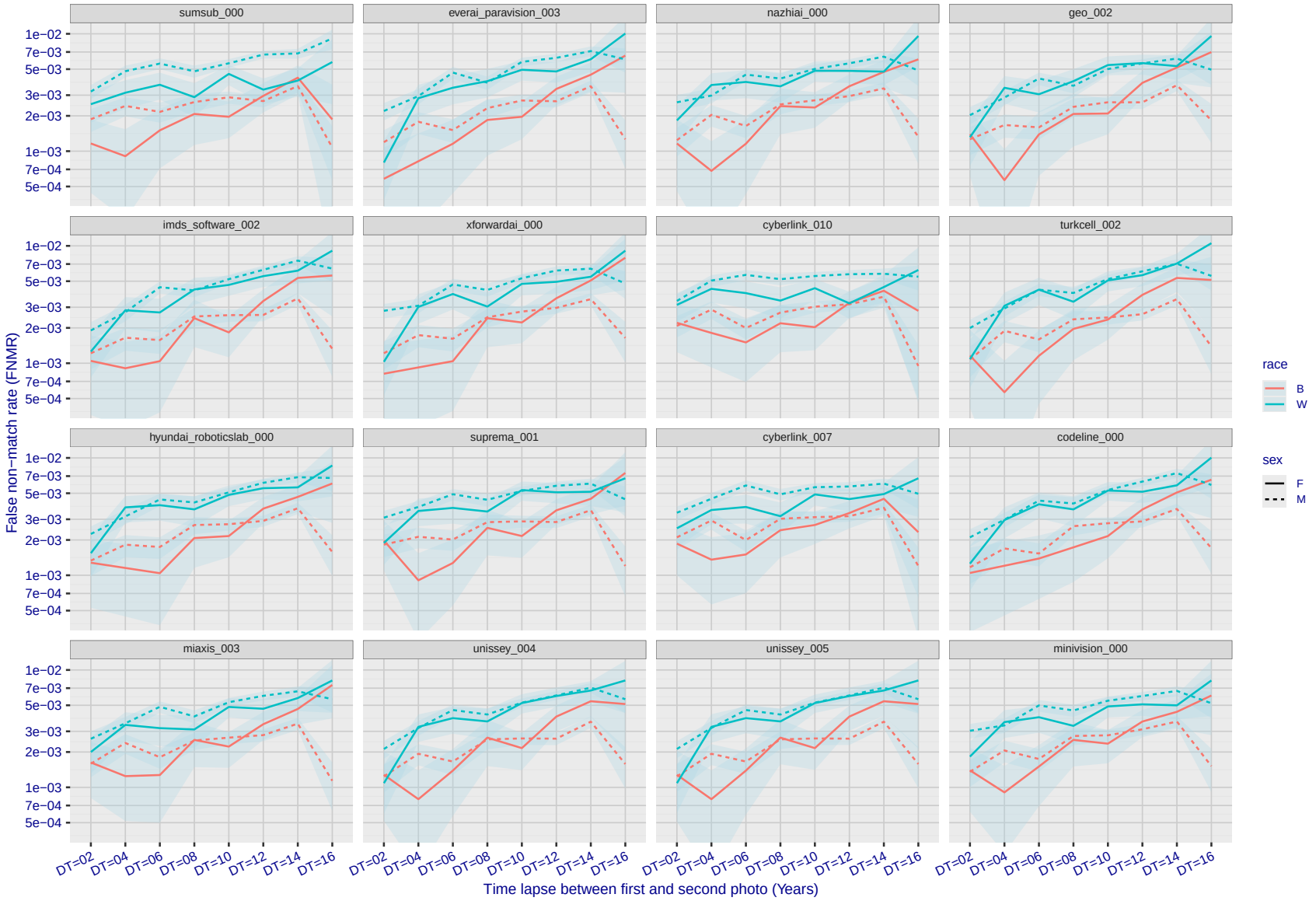

Figure 716: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

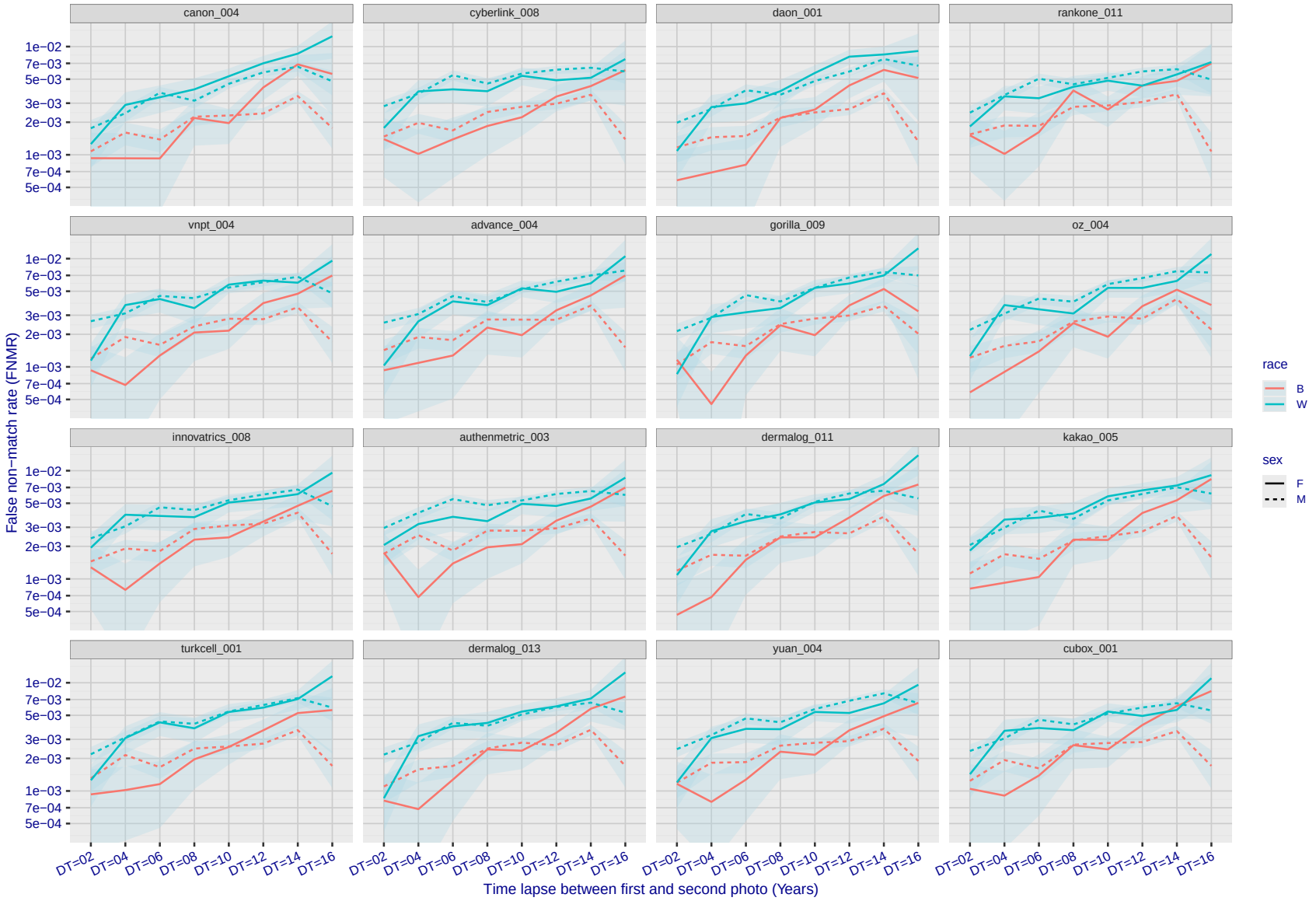

Figure 717: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

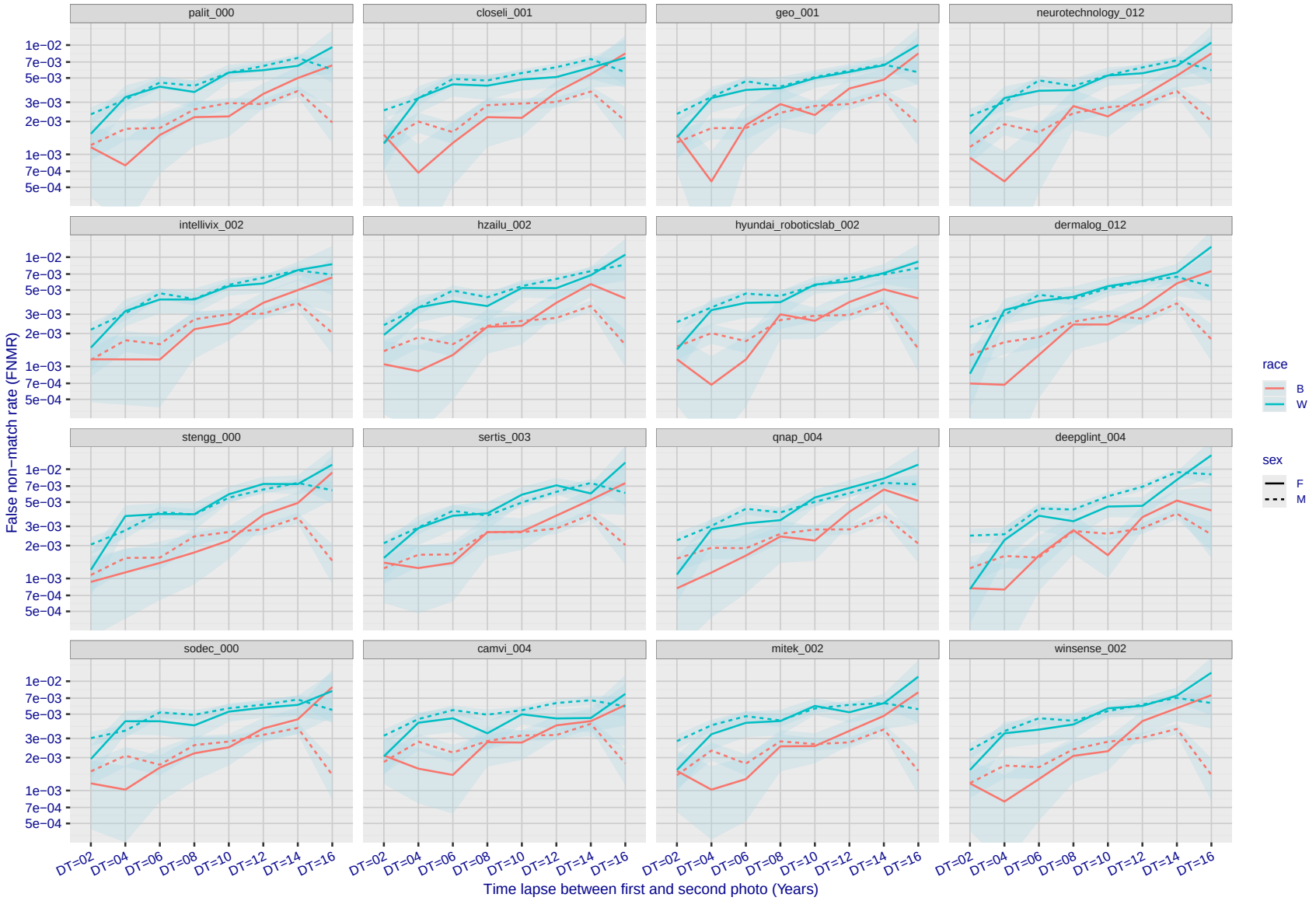

Figure 718: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

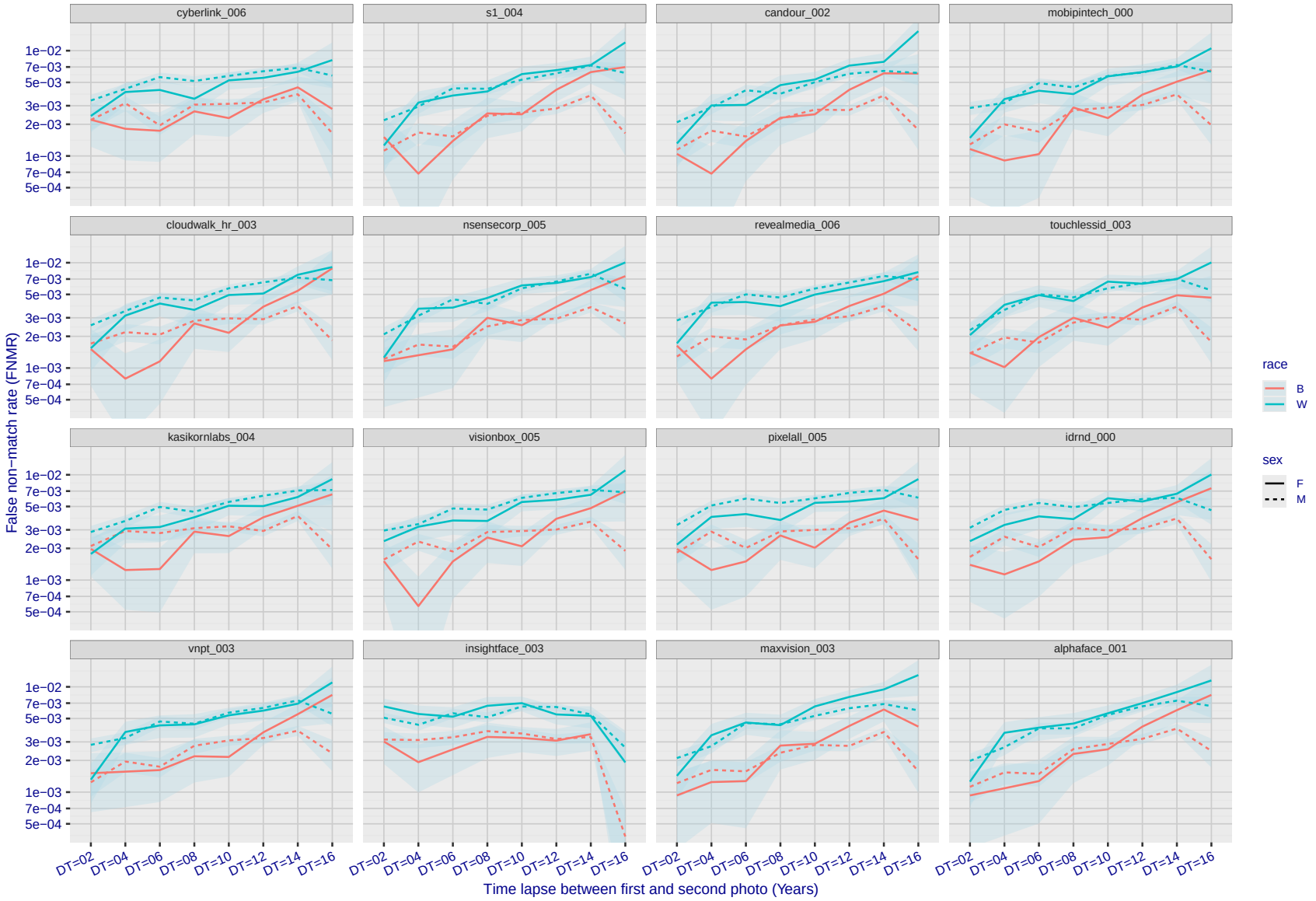

Figure 719: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

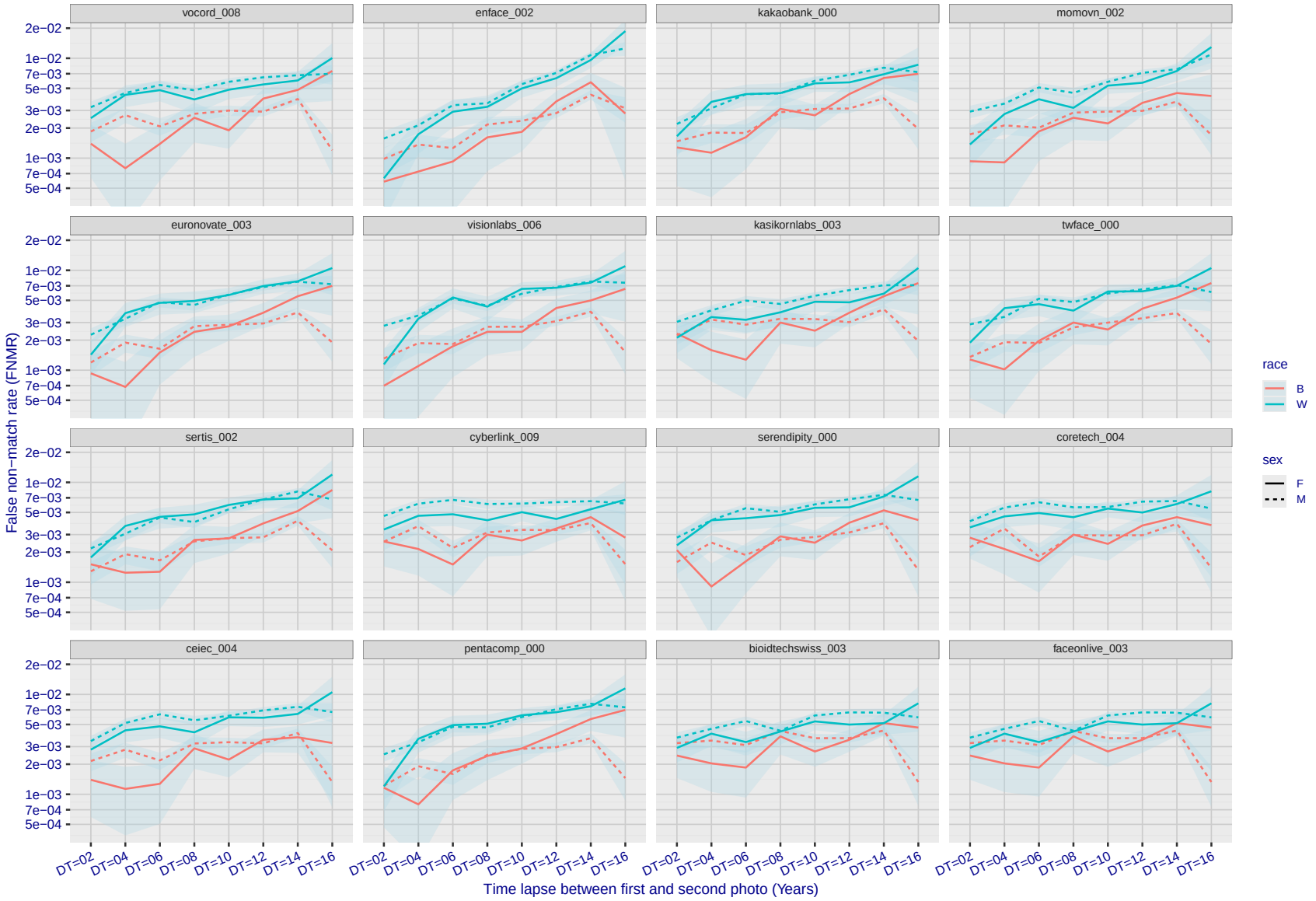

Figure 720: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\bar{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

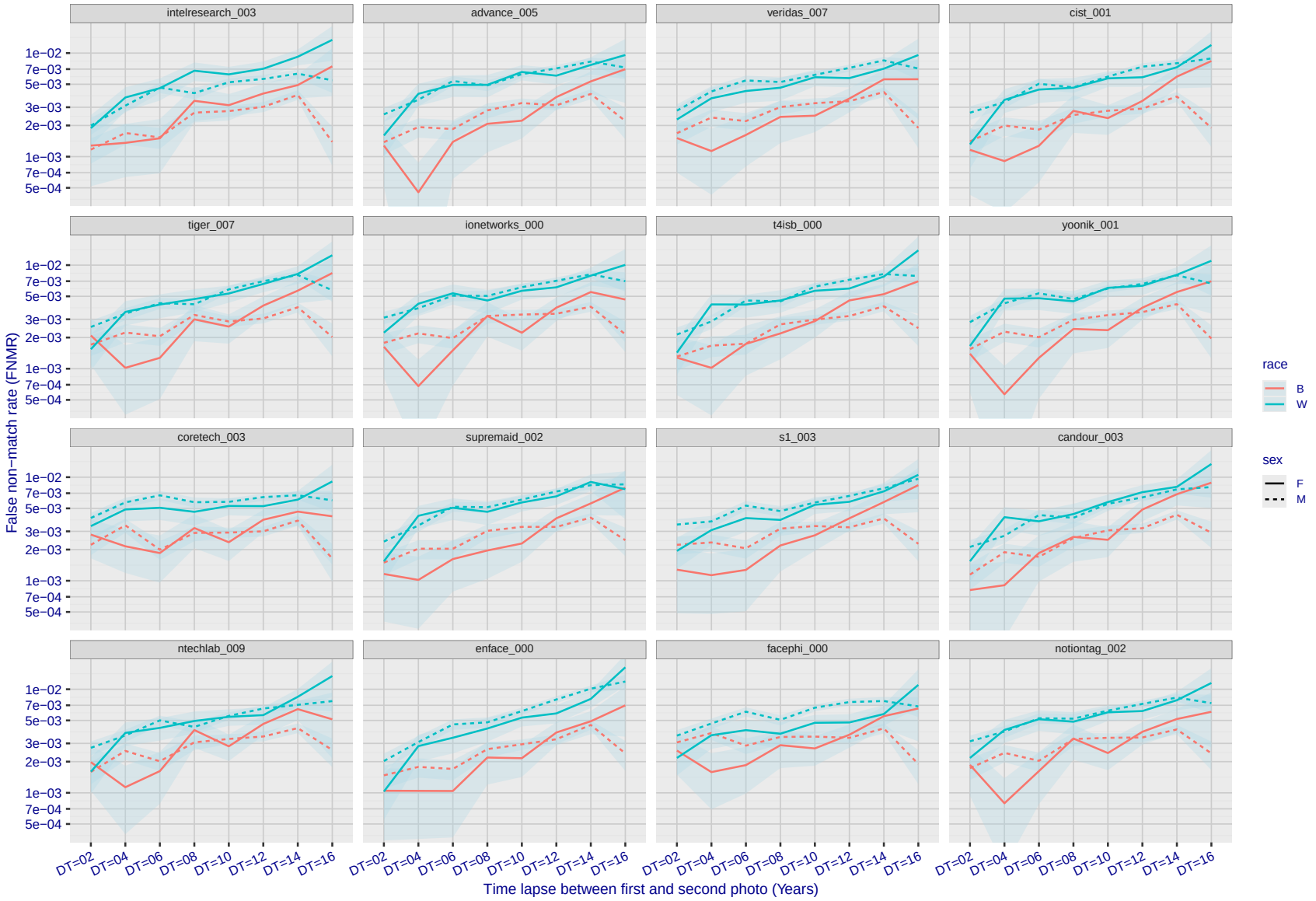

Figure 721: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

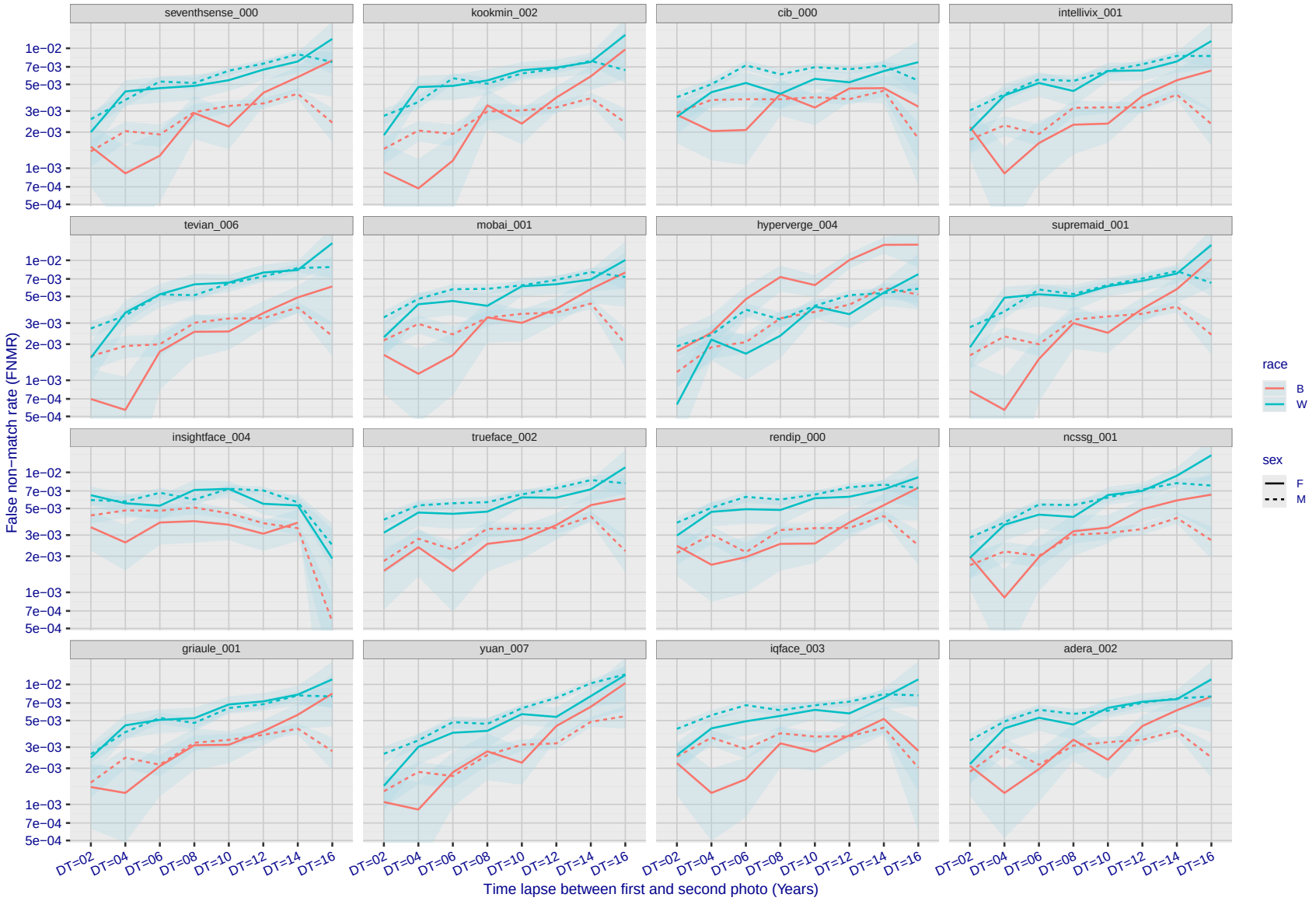

Figure 722: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

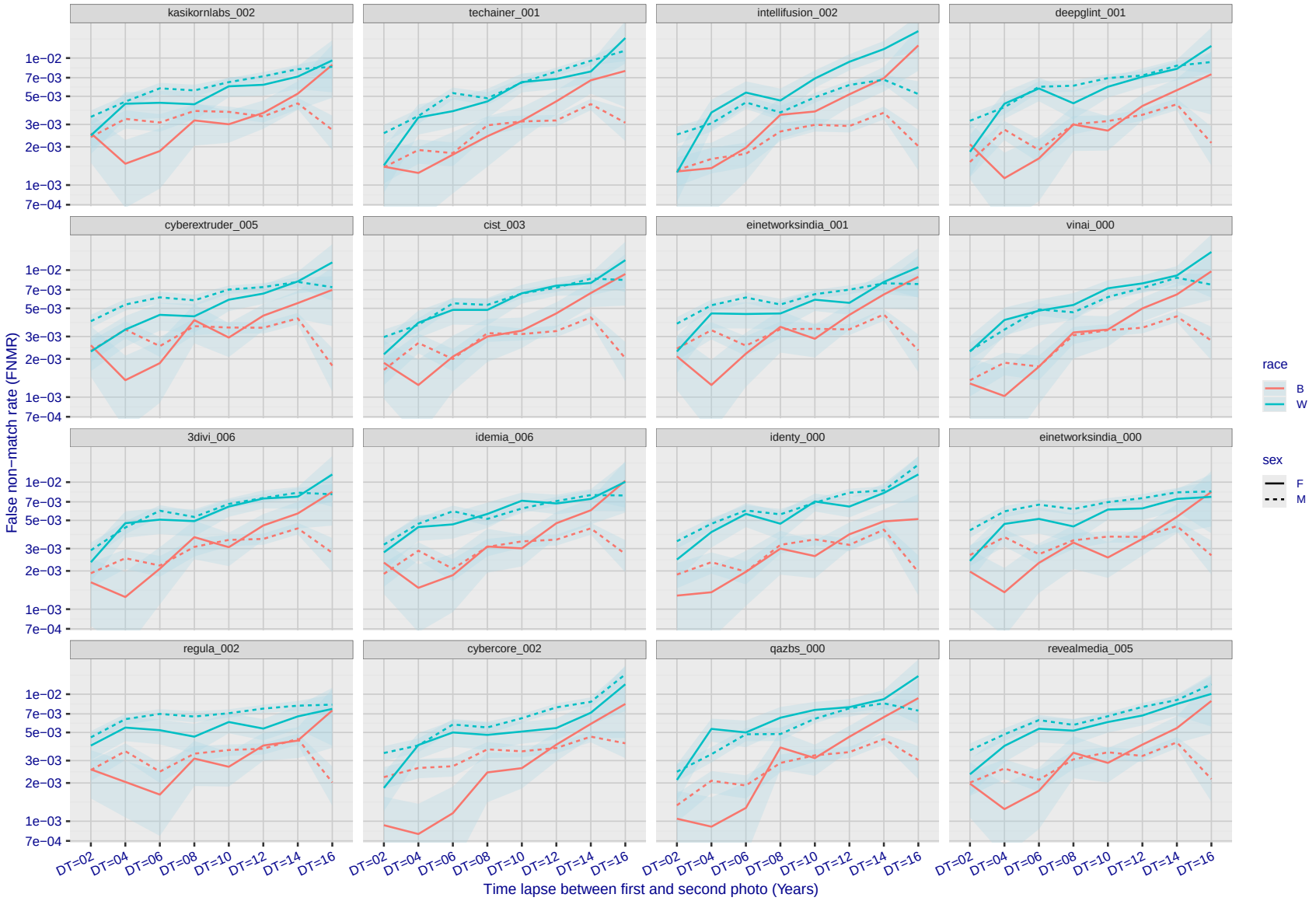

Figure 723: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

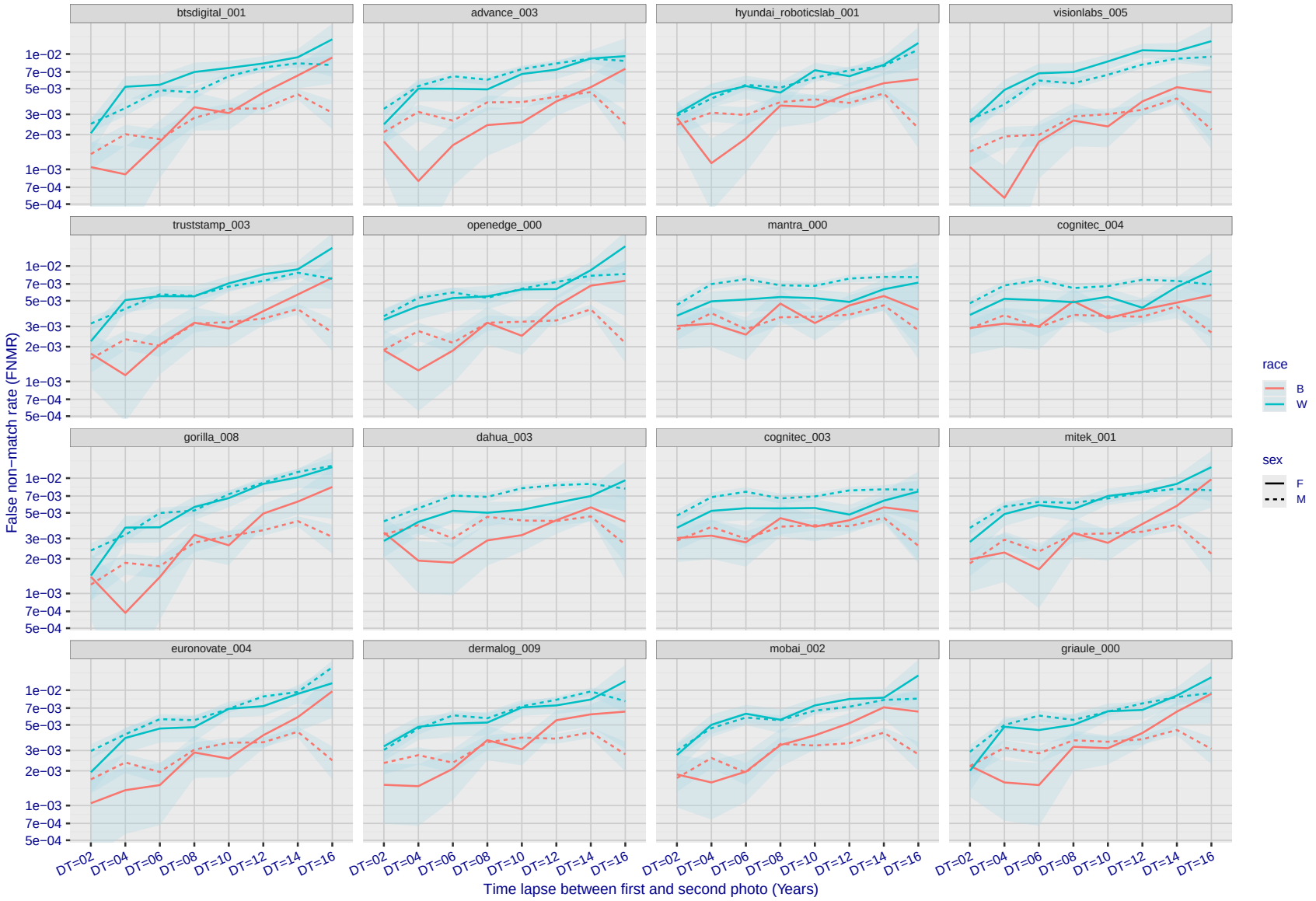

Figure 724: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widetilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

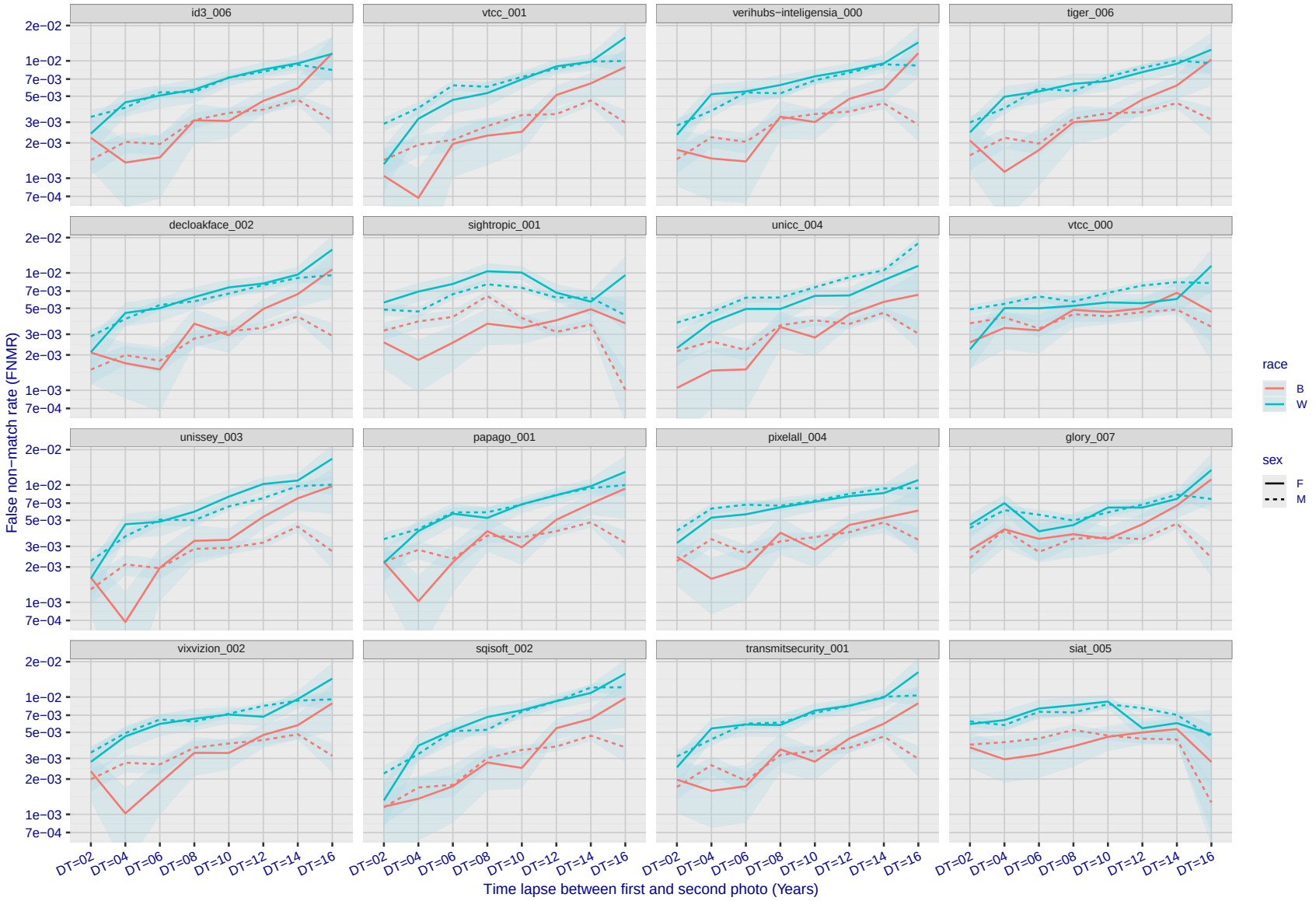

Figure 725: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

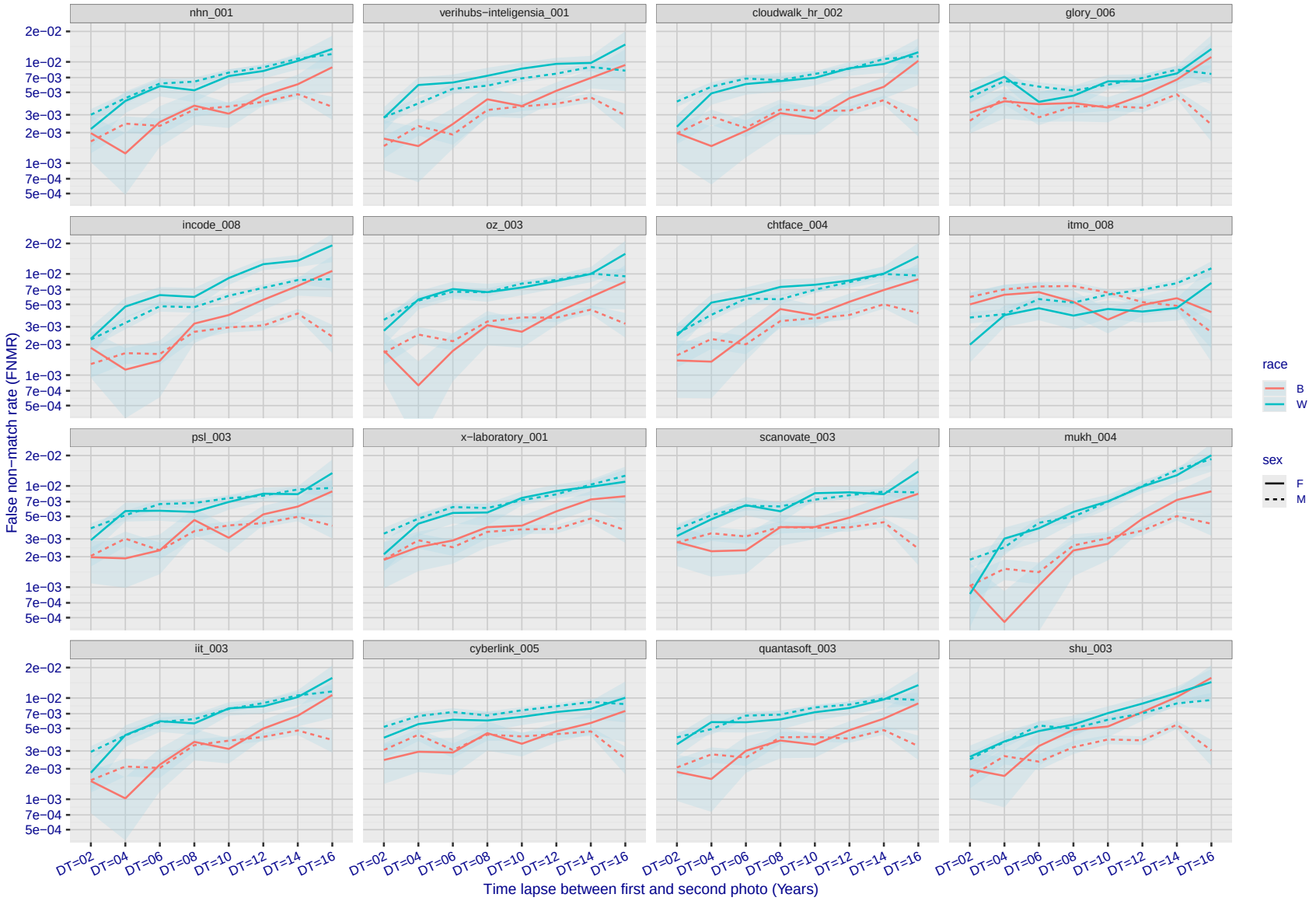

Figure 726: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

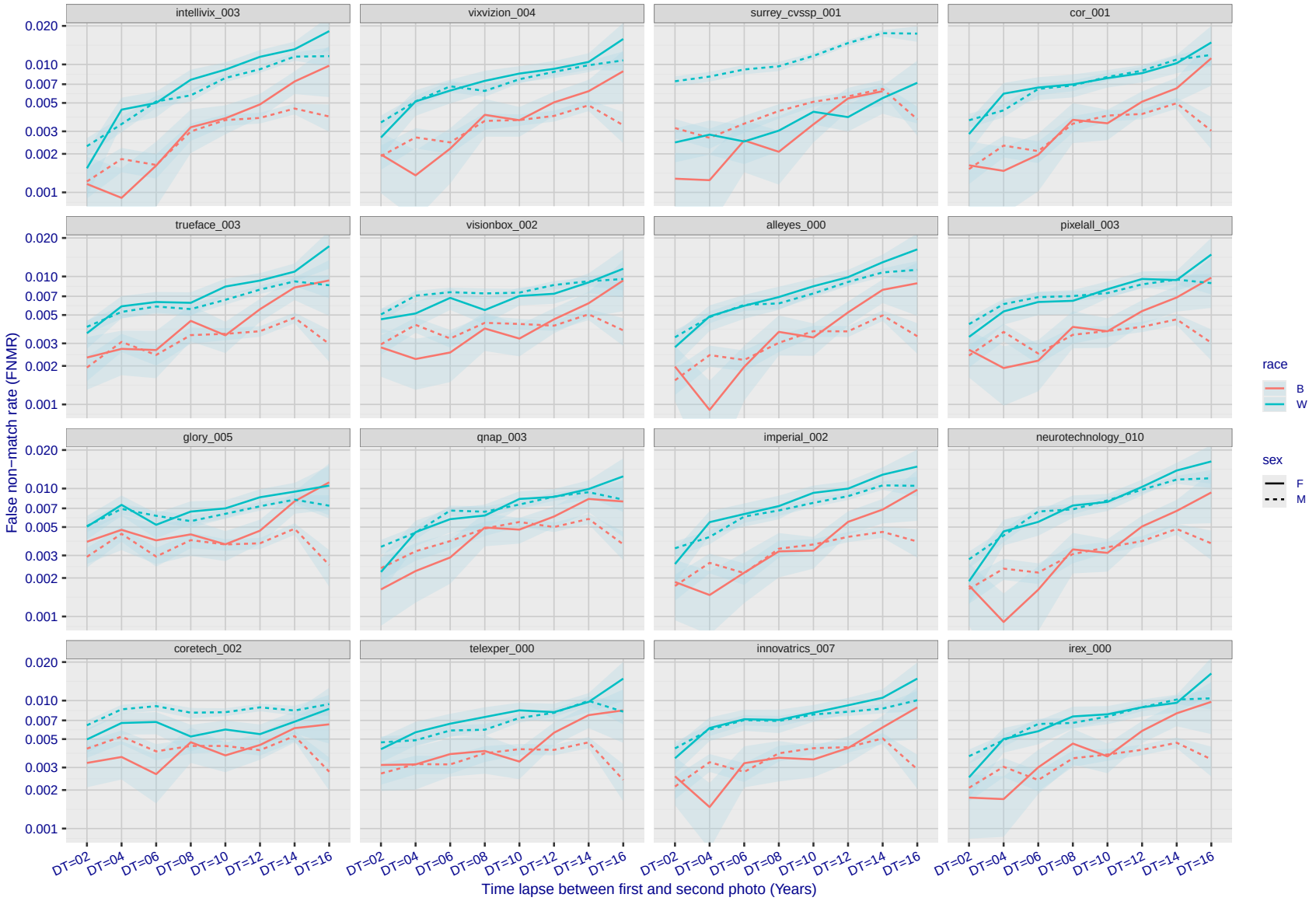

Figure 727: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

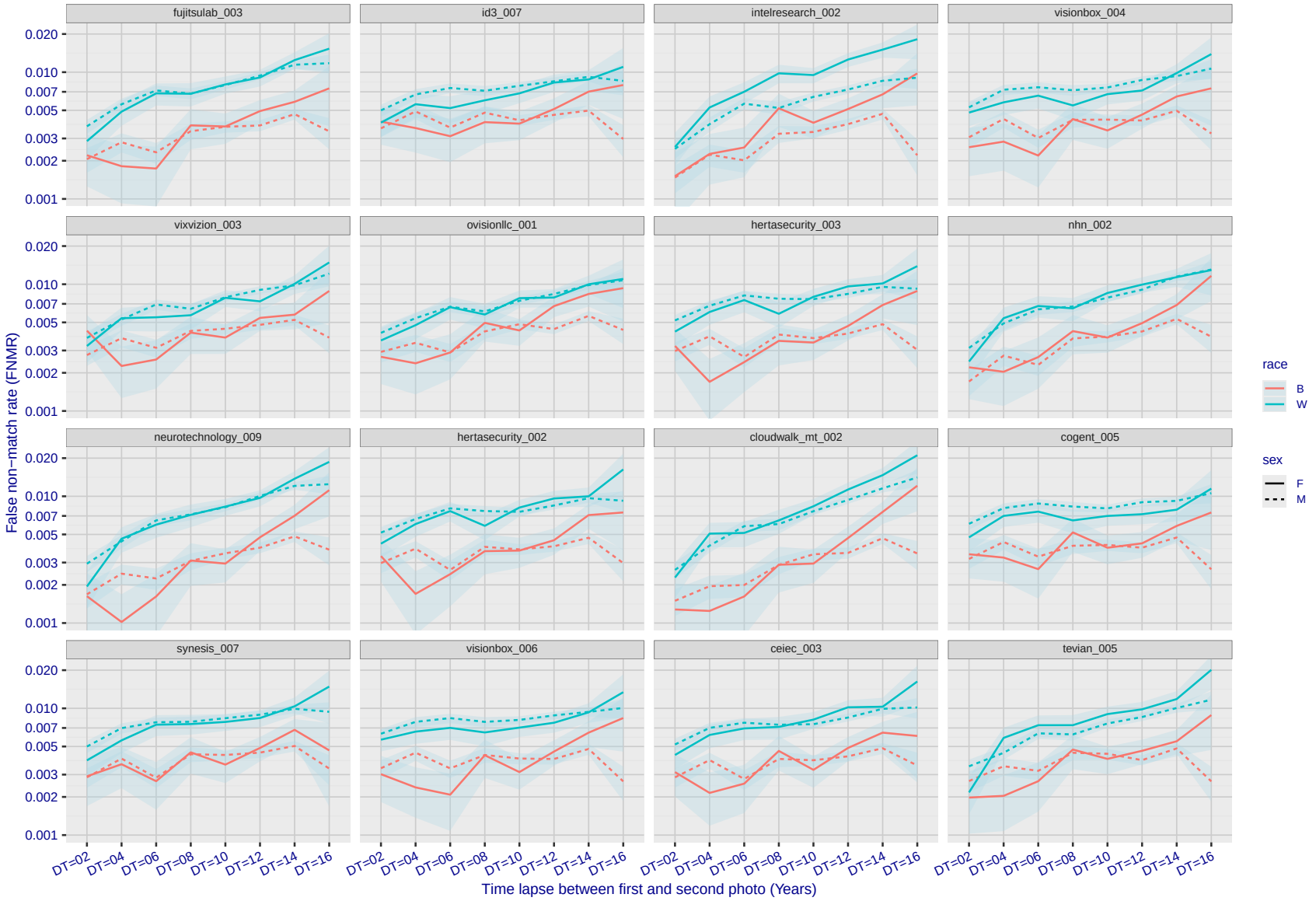

Figure 728: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

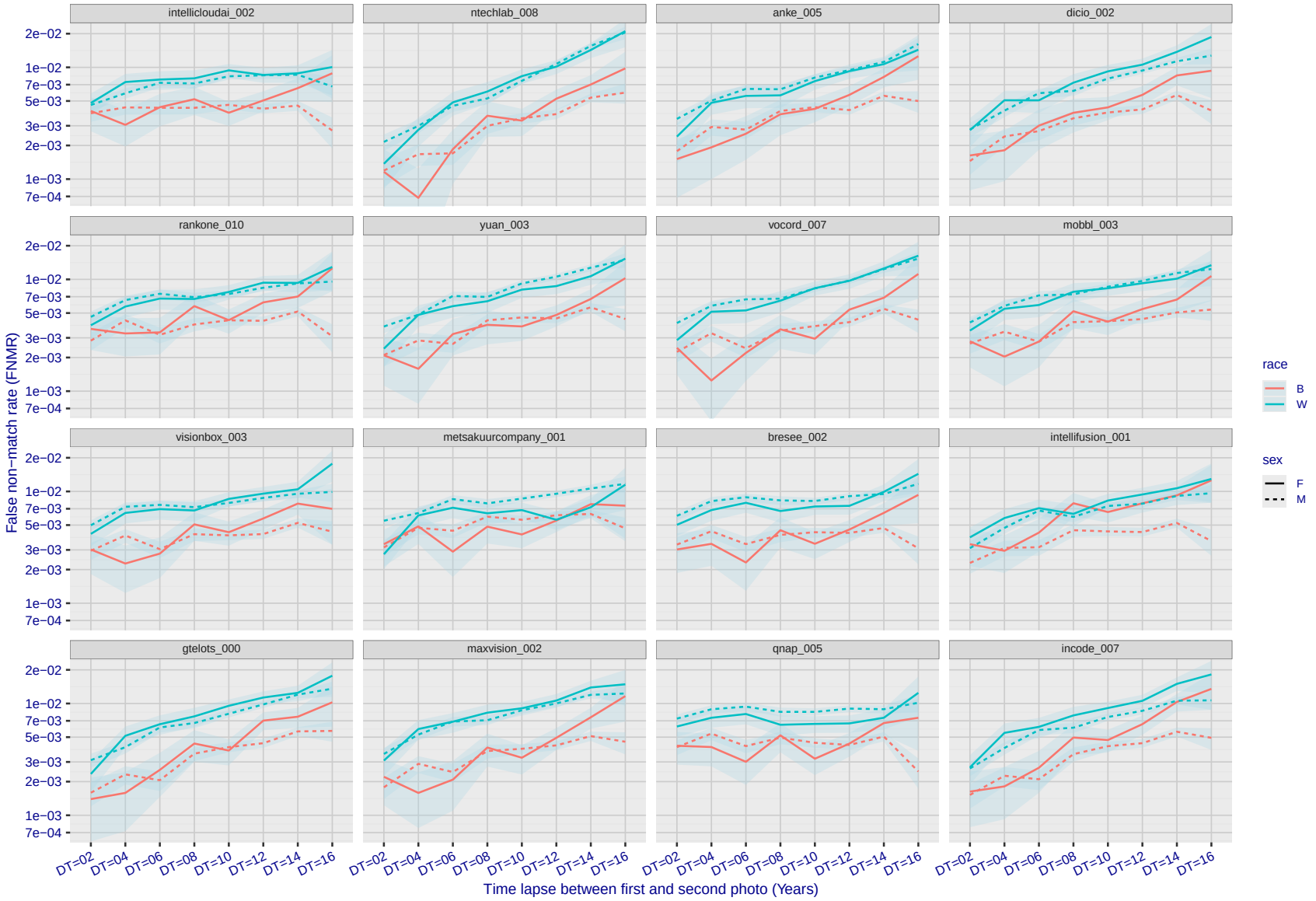

Figure 729: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\tilde{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

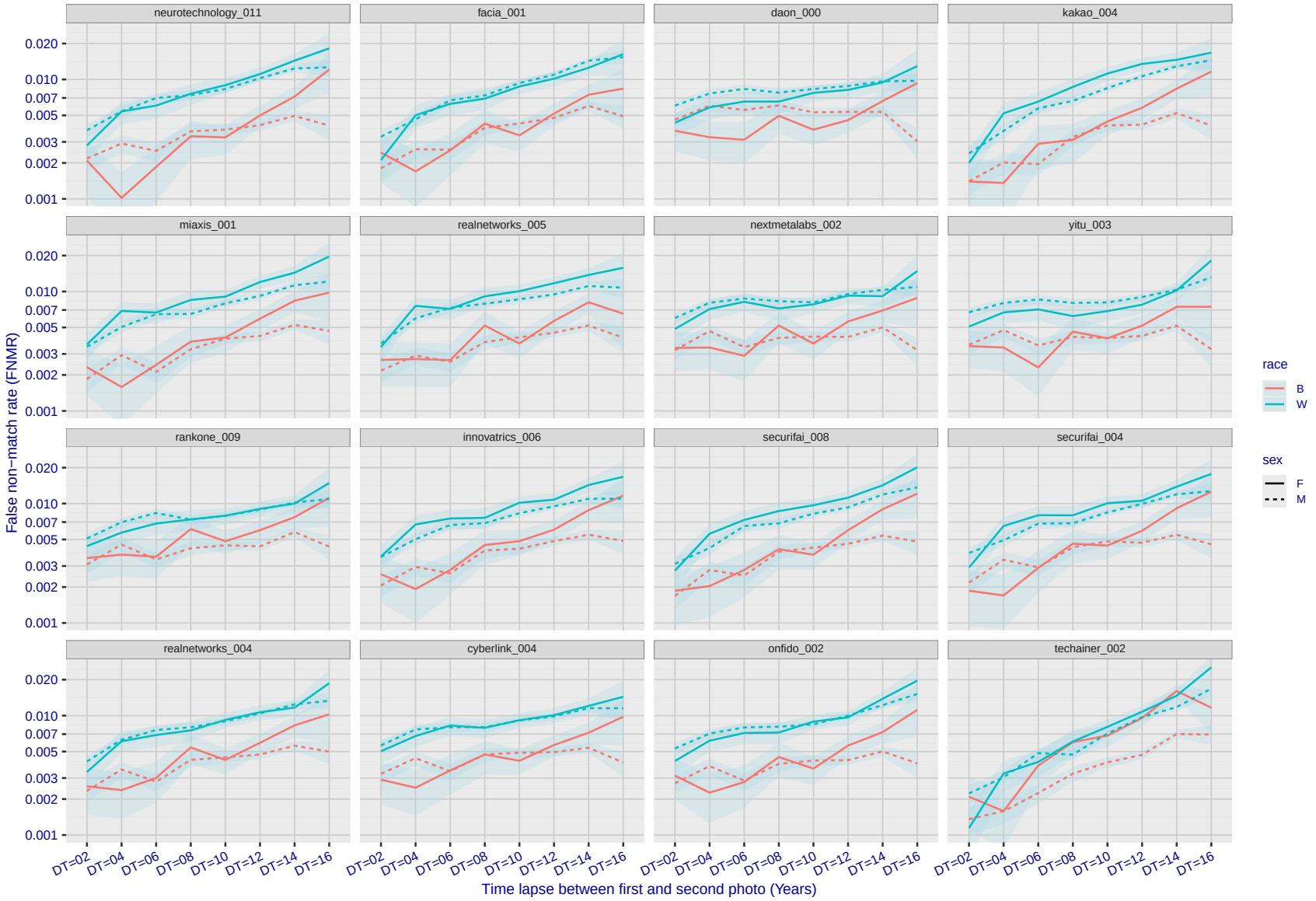

Figure 730: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

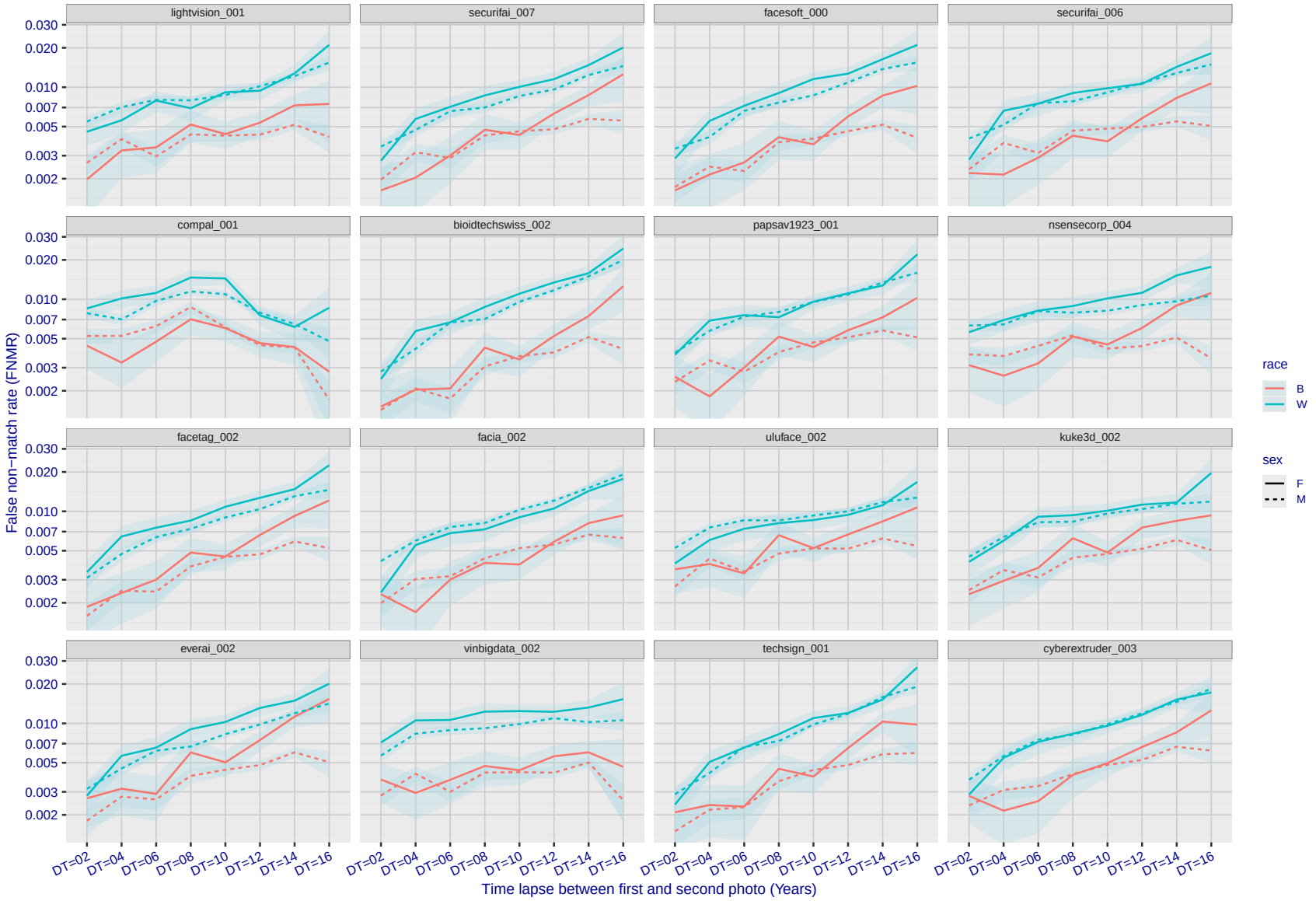

Figure 731: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

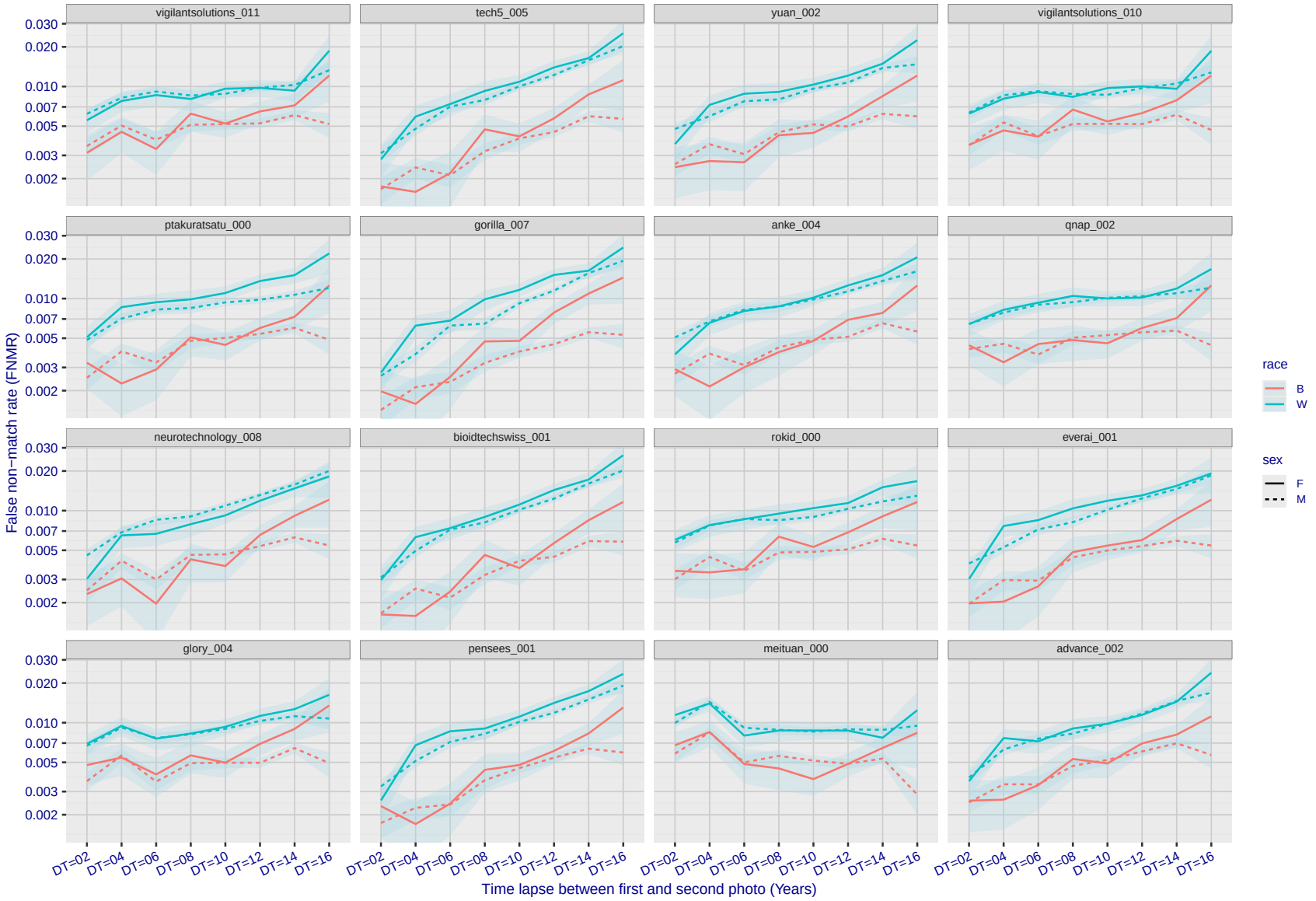

Figure 732: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

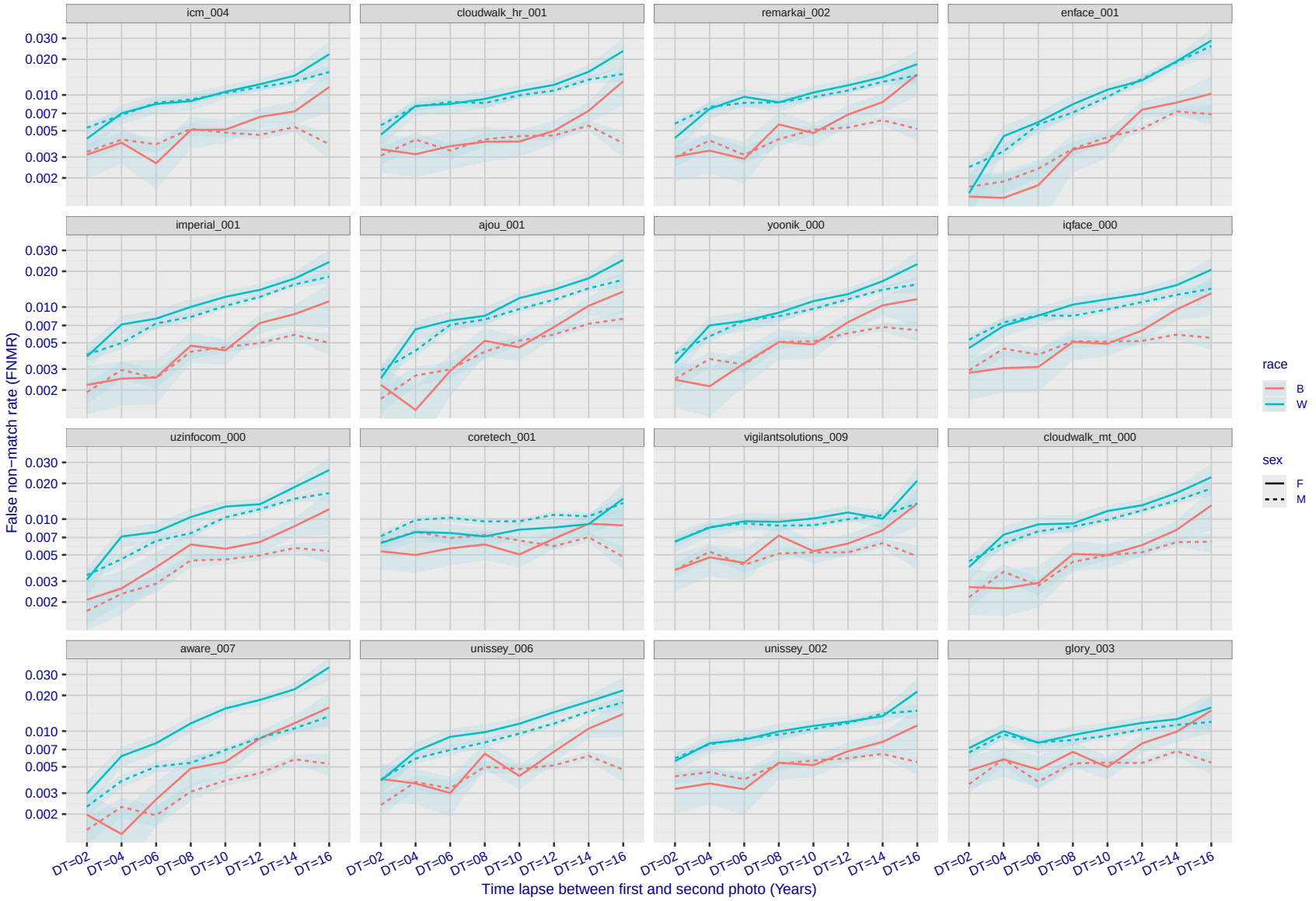

Figure 733: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

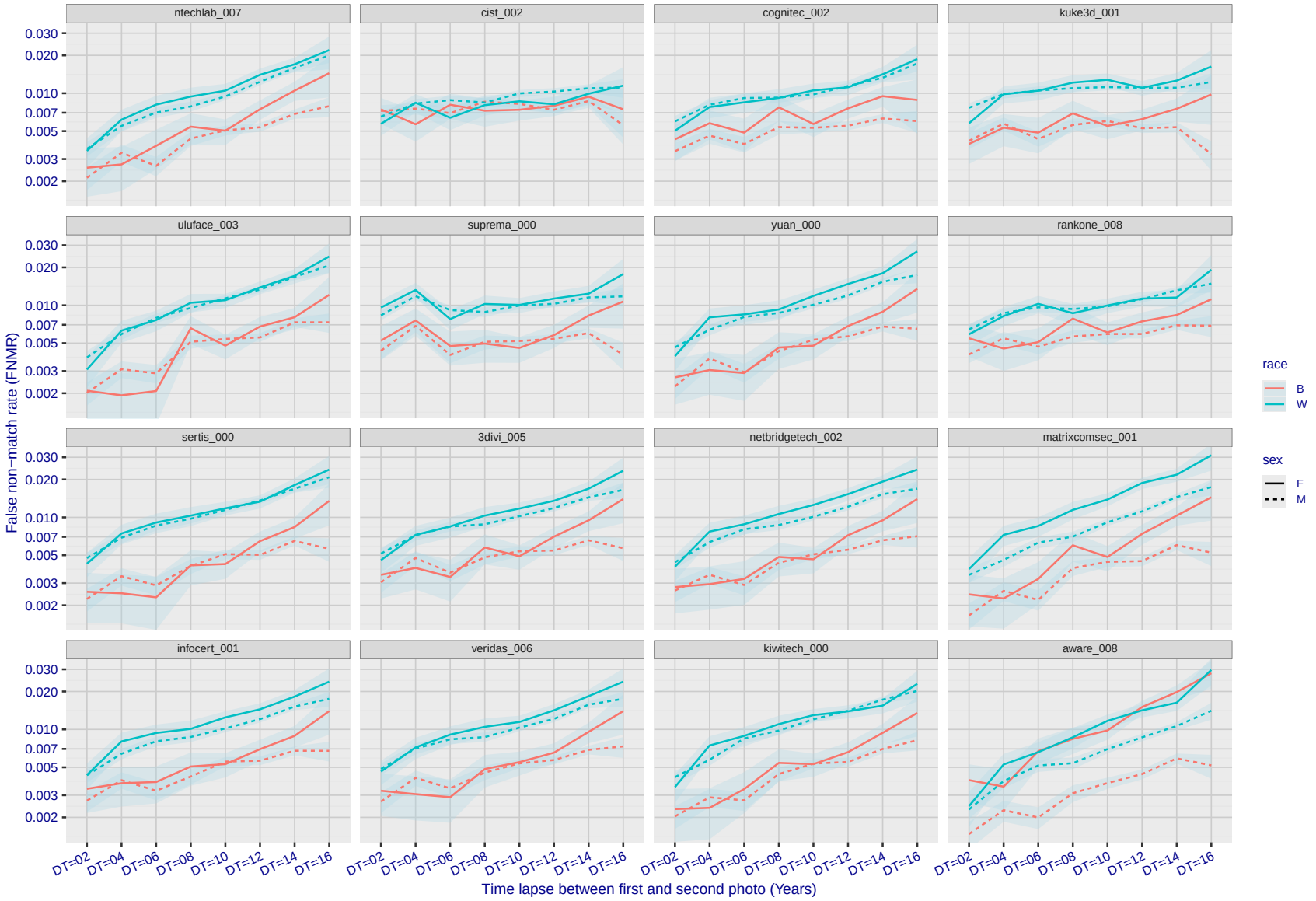

Figure 734: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

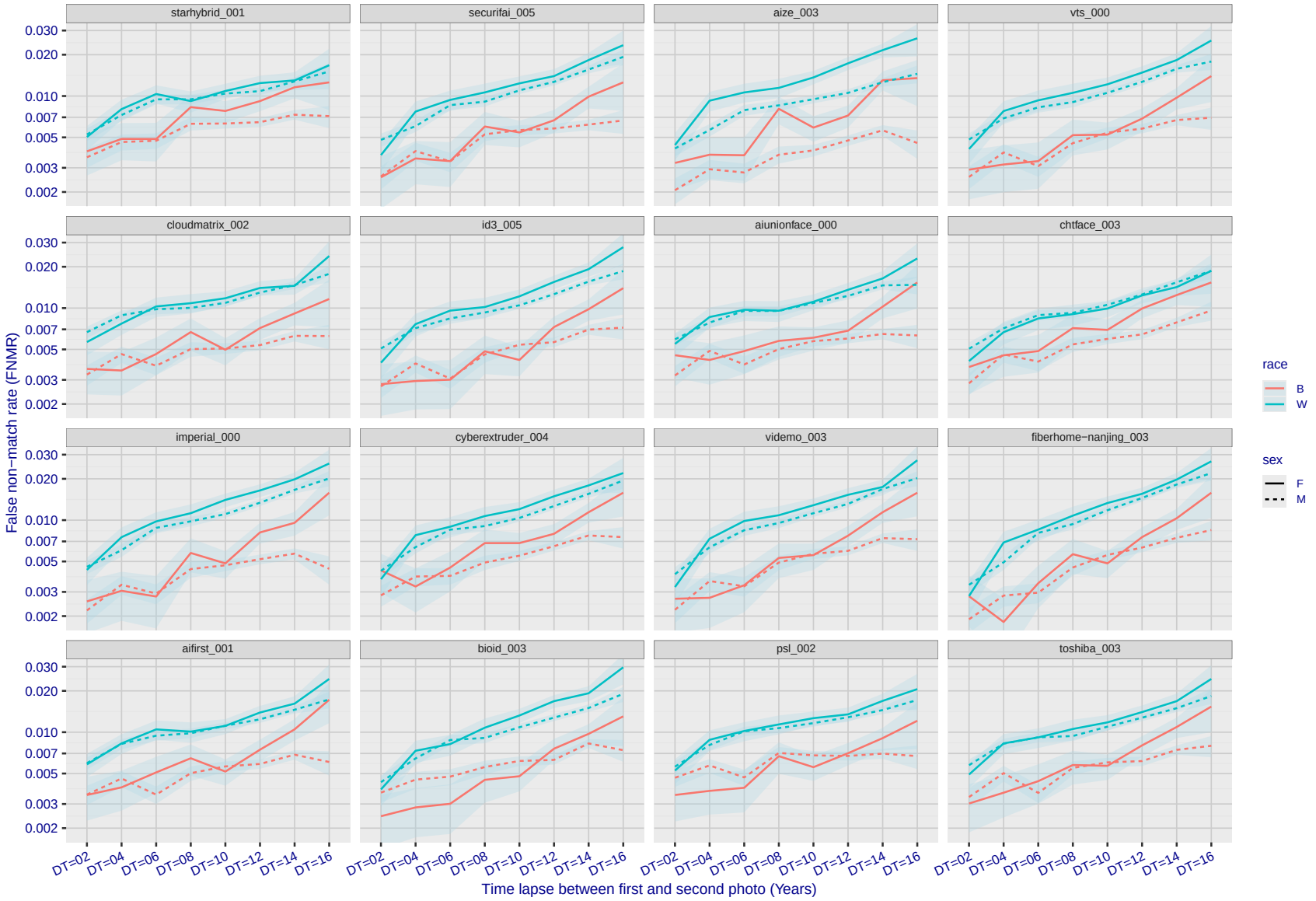

Figure 735: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

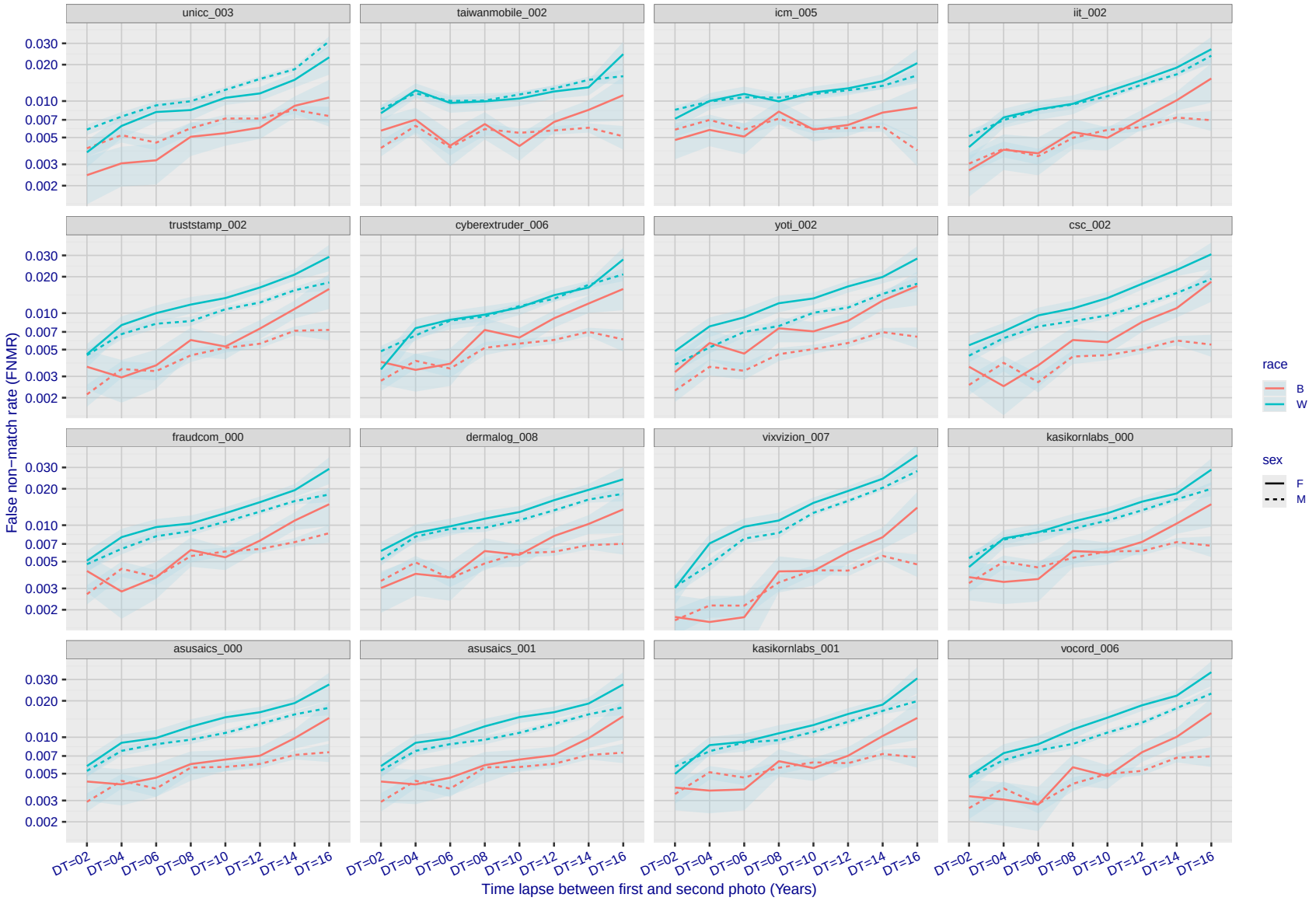

Figure 736: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

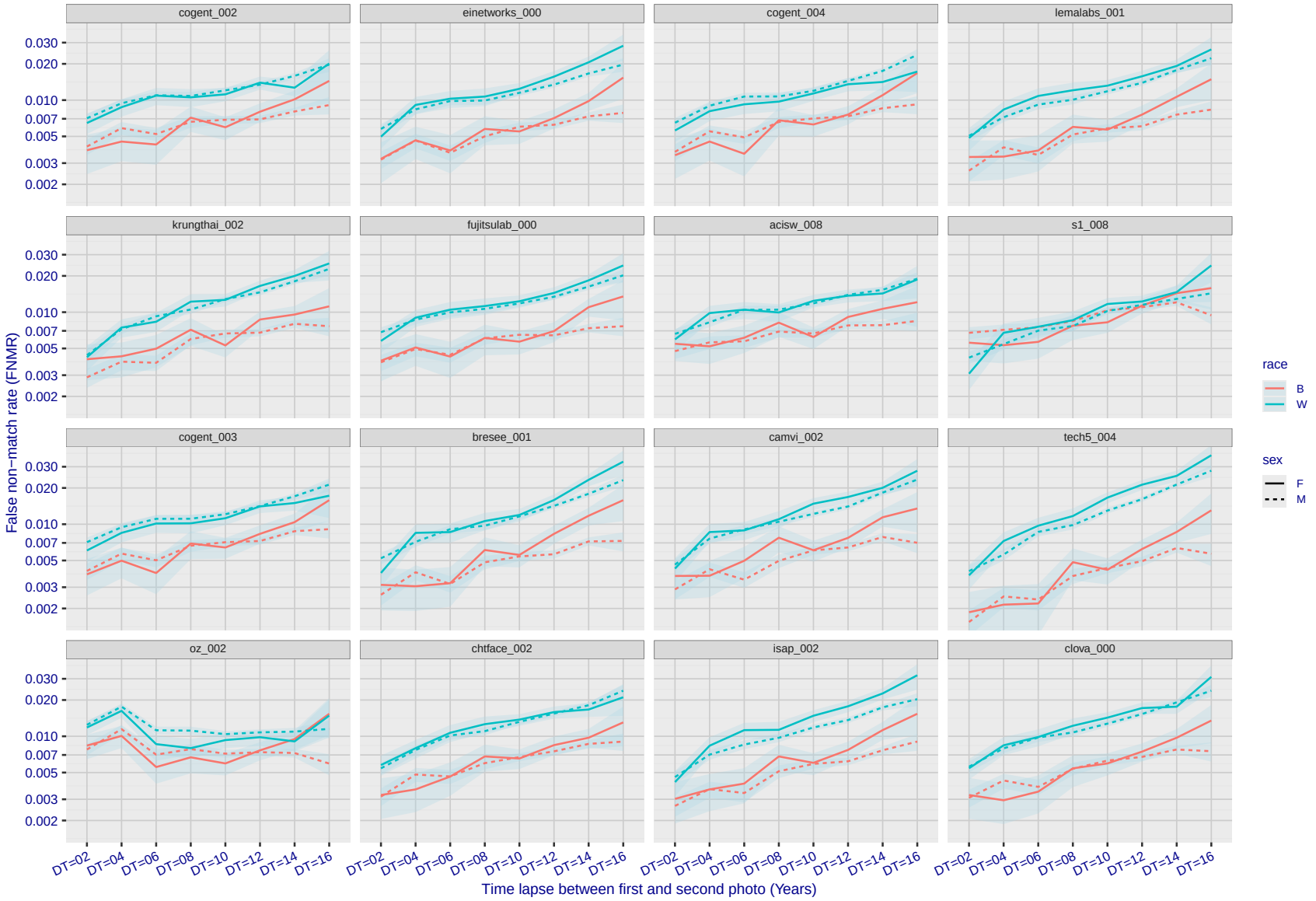

Figure 737: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

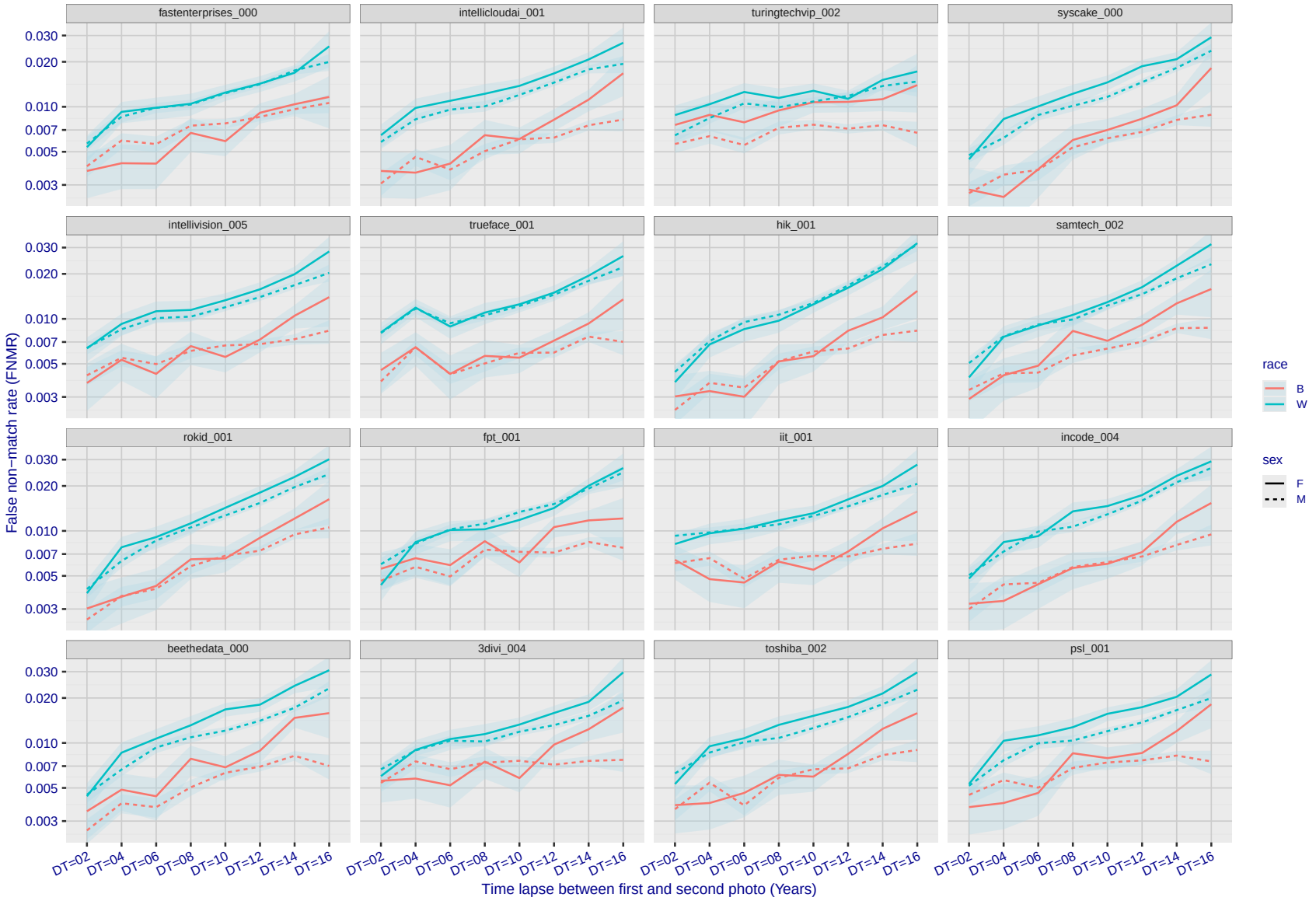

Figure 738: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

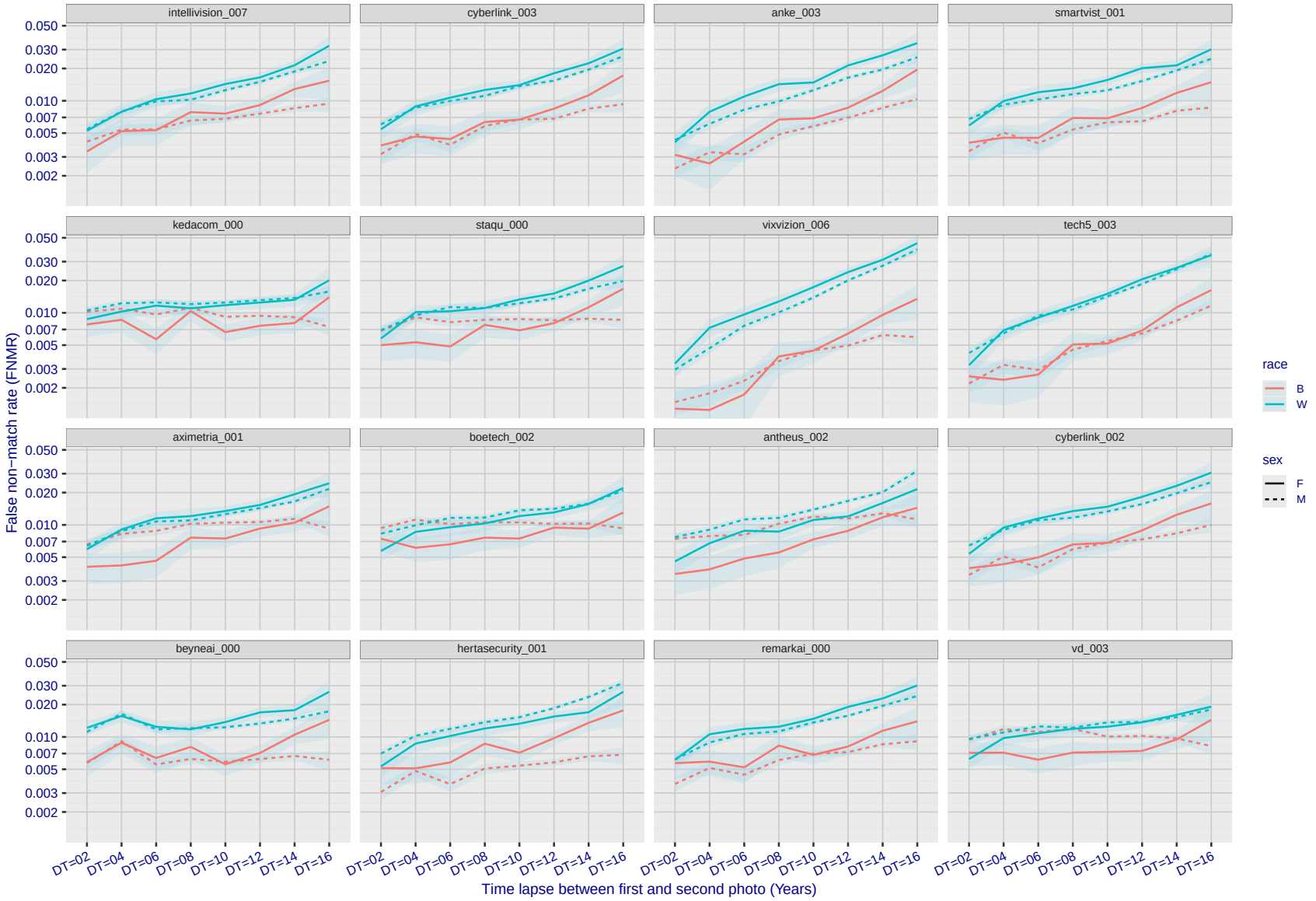

Figure 739: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

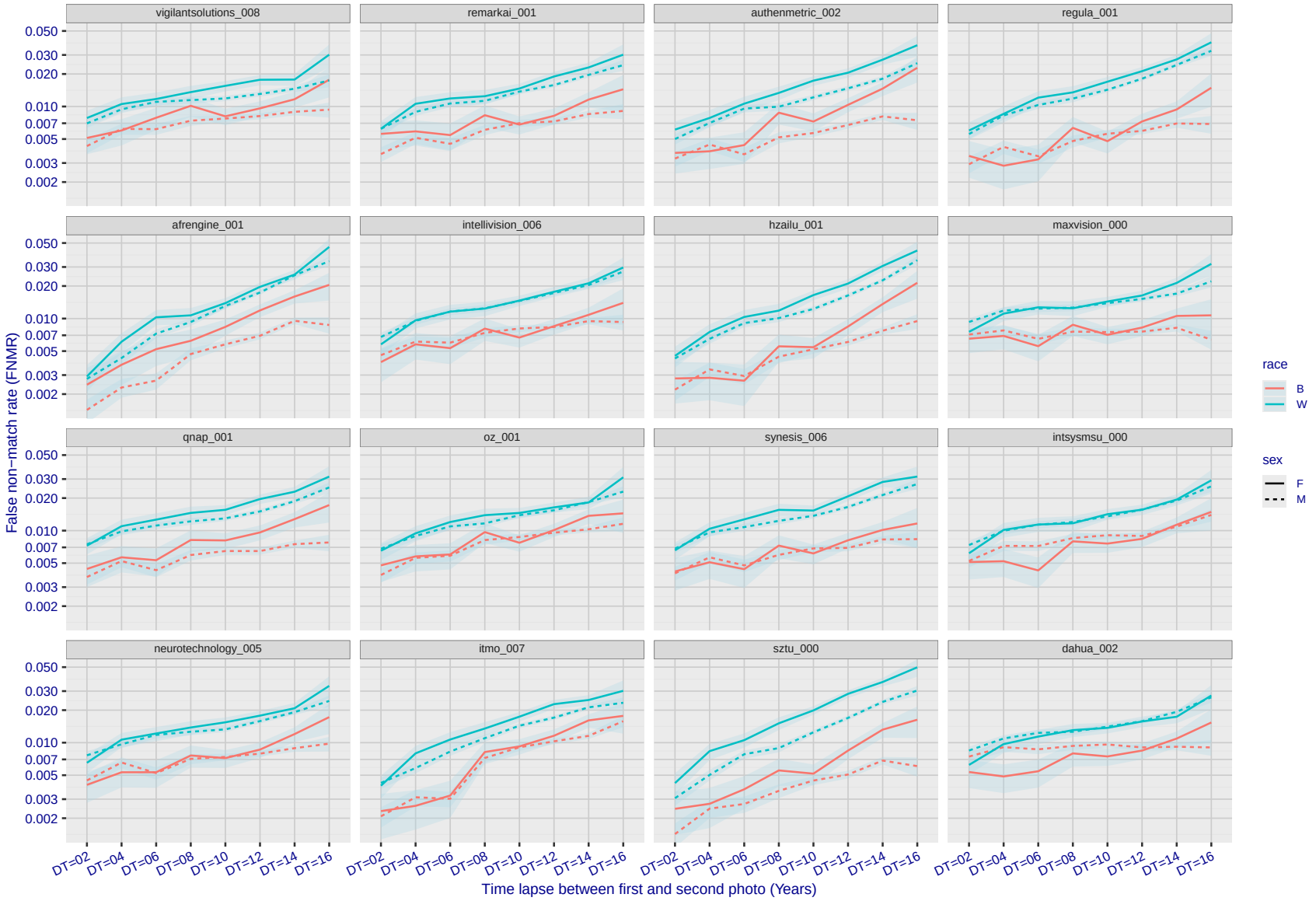

Figure 740: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

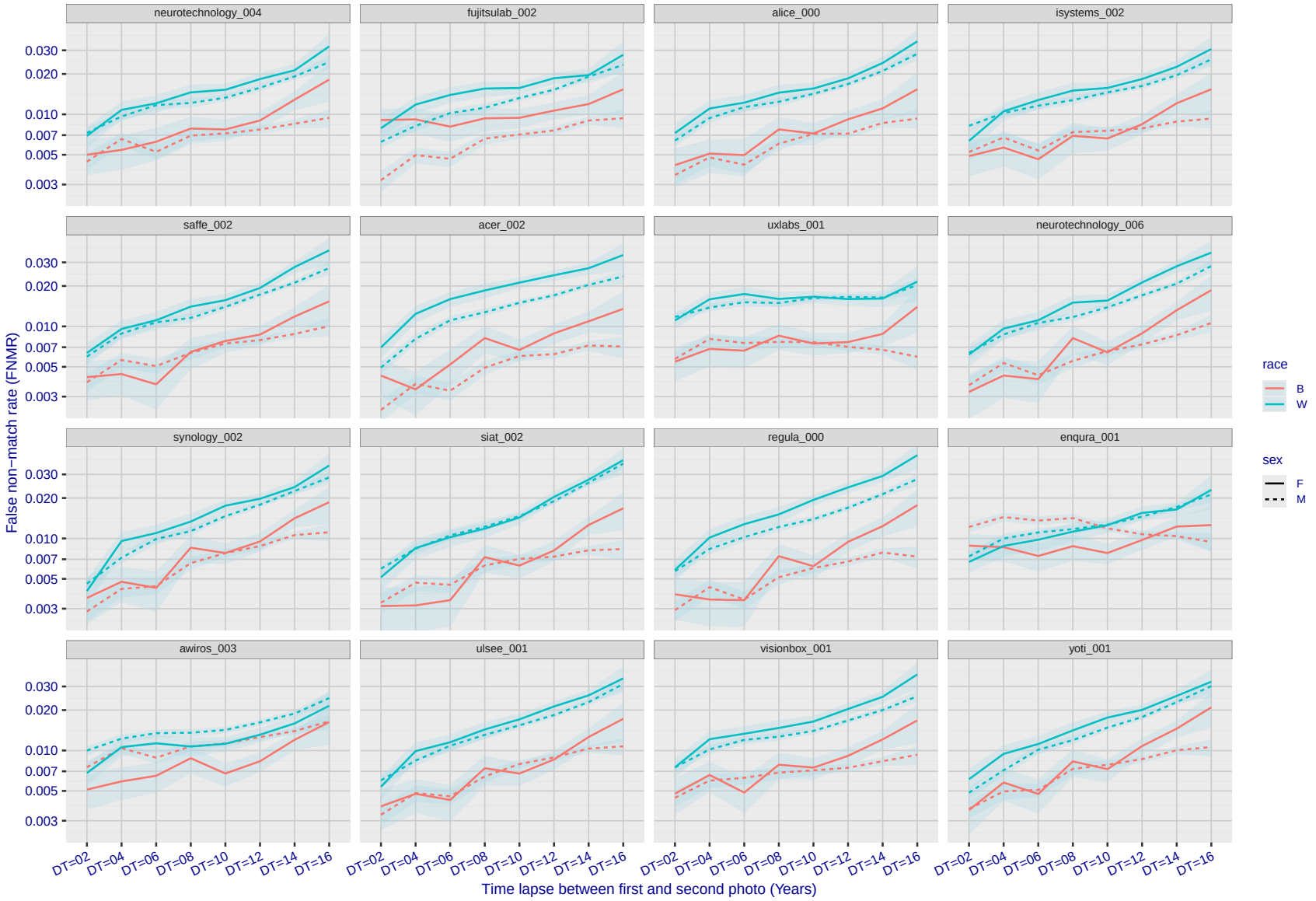

Figure 741: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all ($\widehat{10}^8$) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

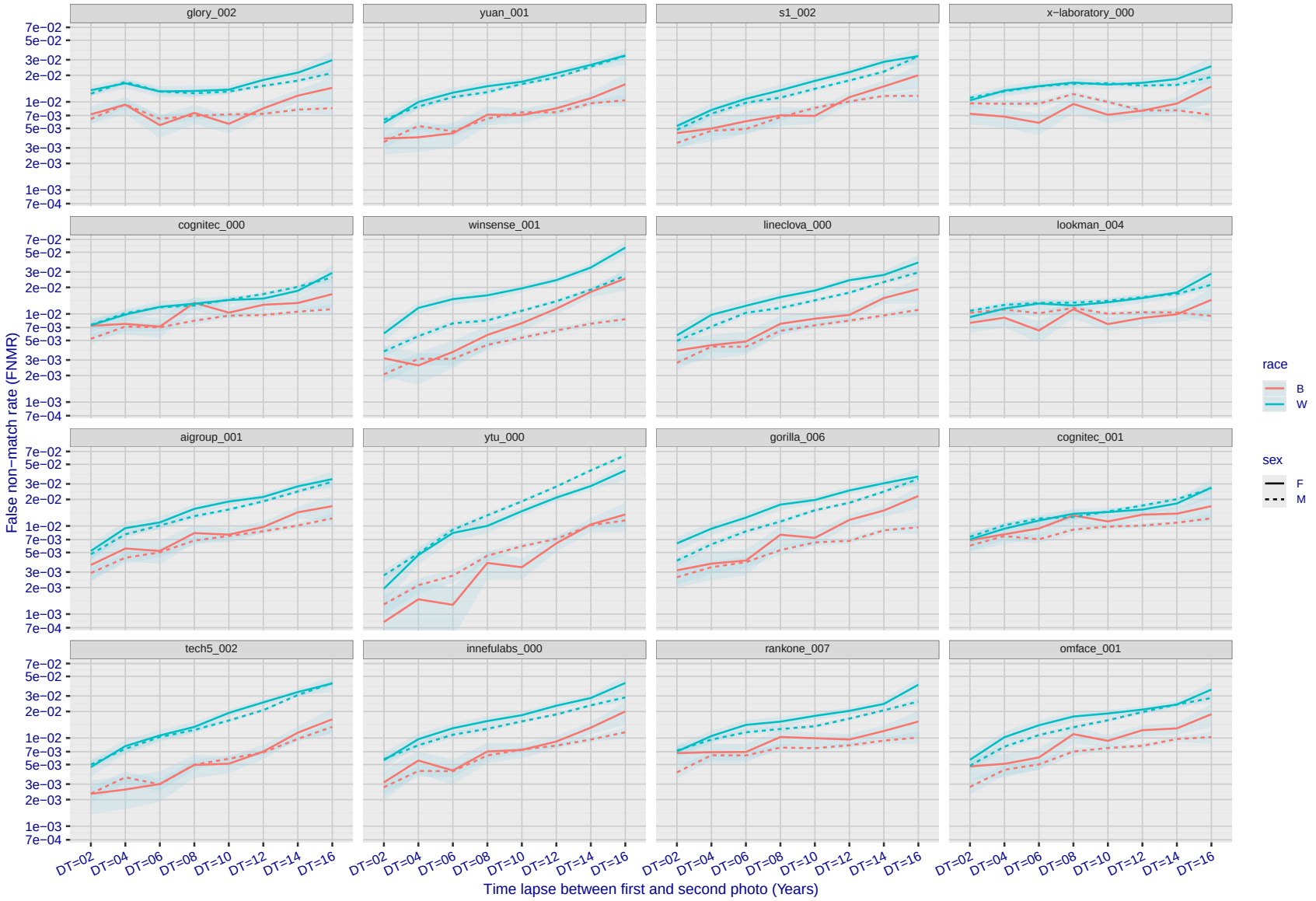

Figure 742: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

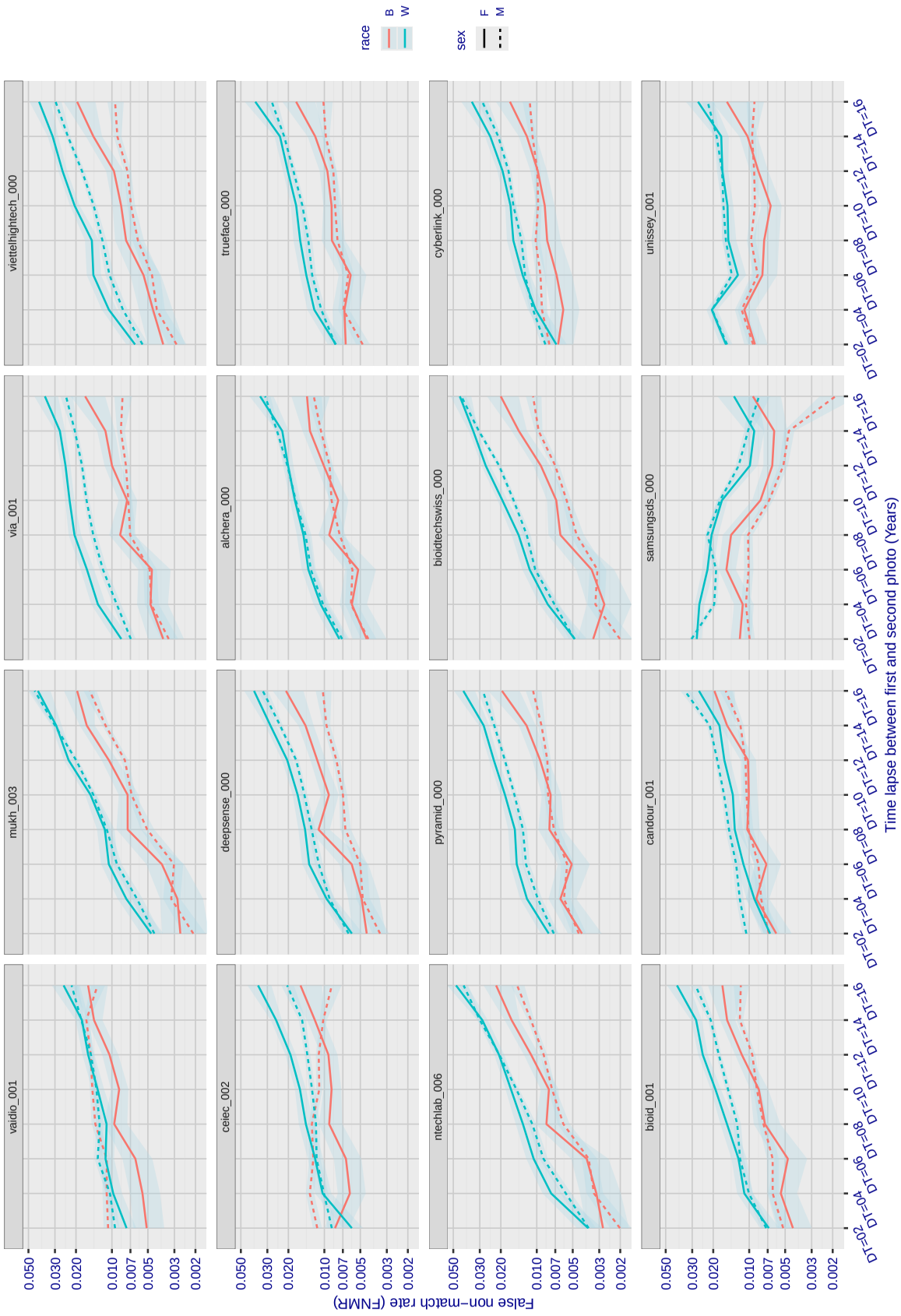

Figure 743: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all* (10^8) *impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (*$FNMR < 0.001$*) so that the uncertainty estimates are high.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

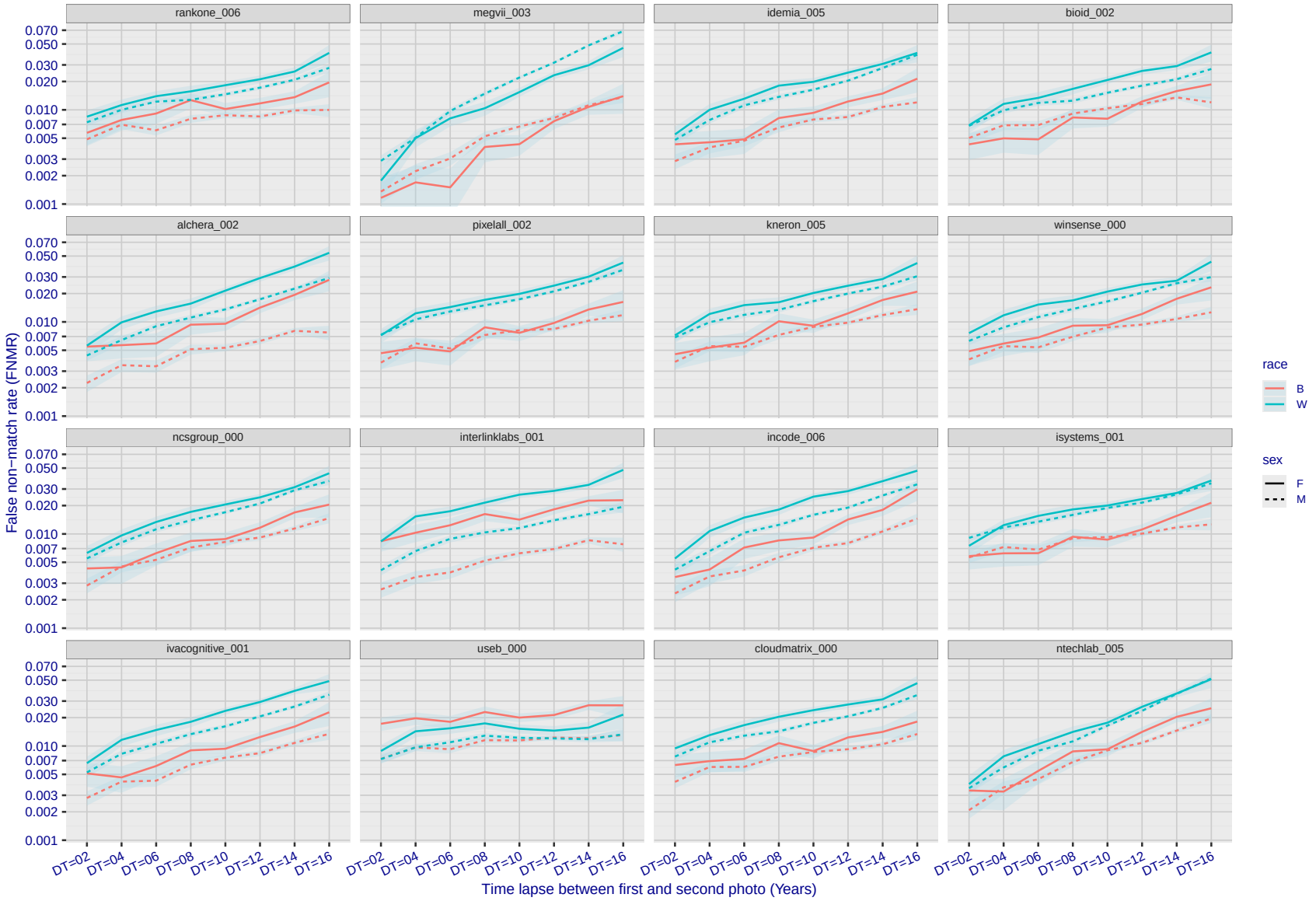

Figure 744: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

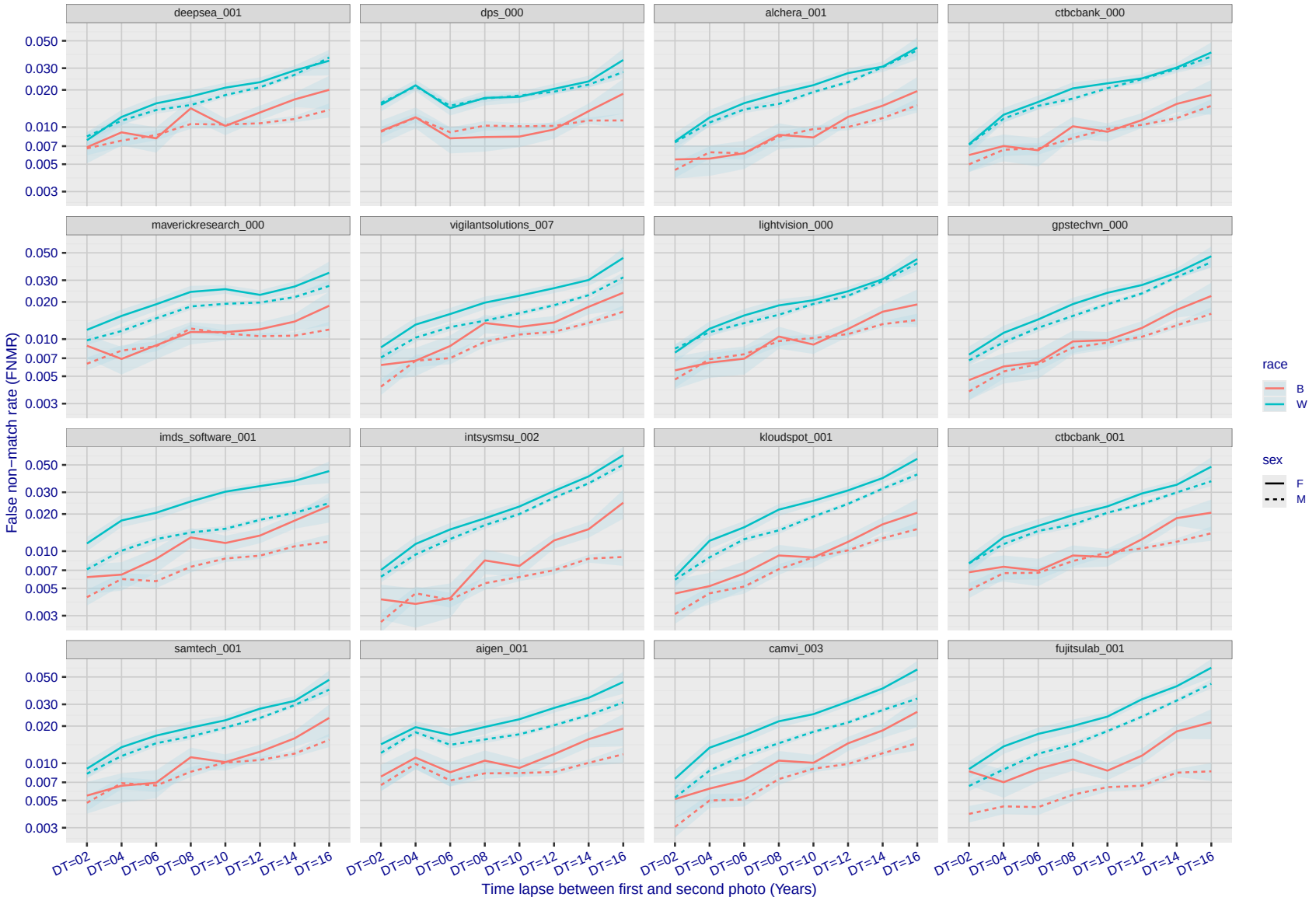

Figure 745: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

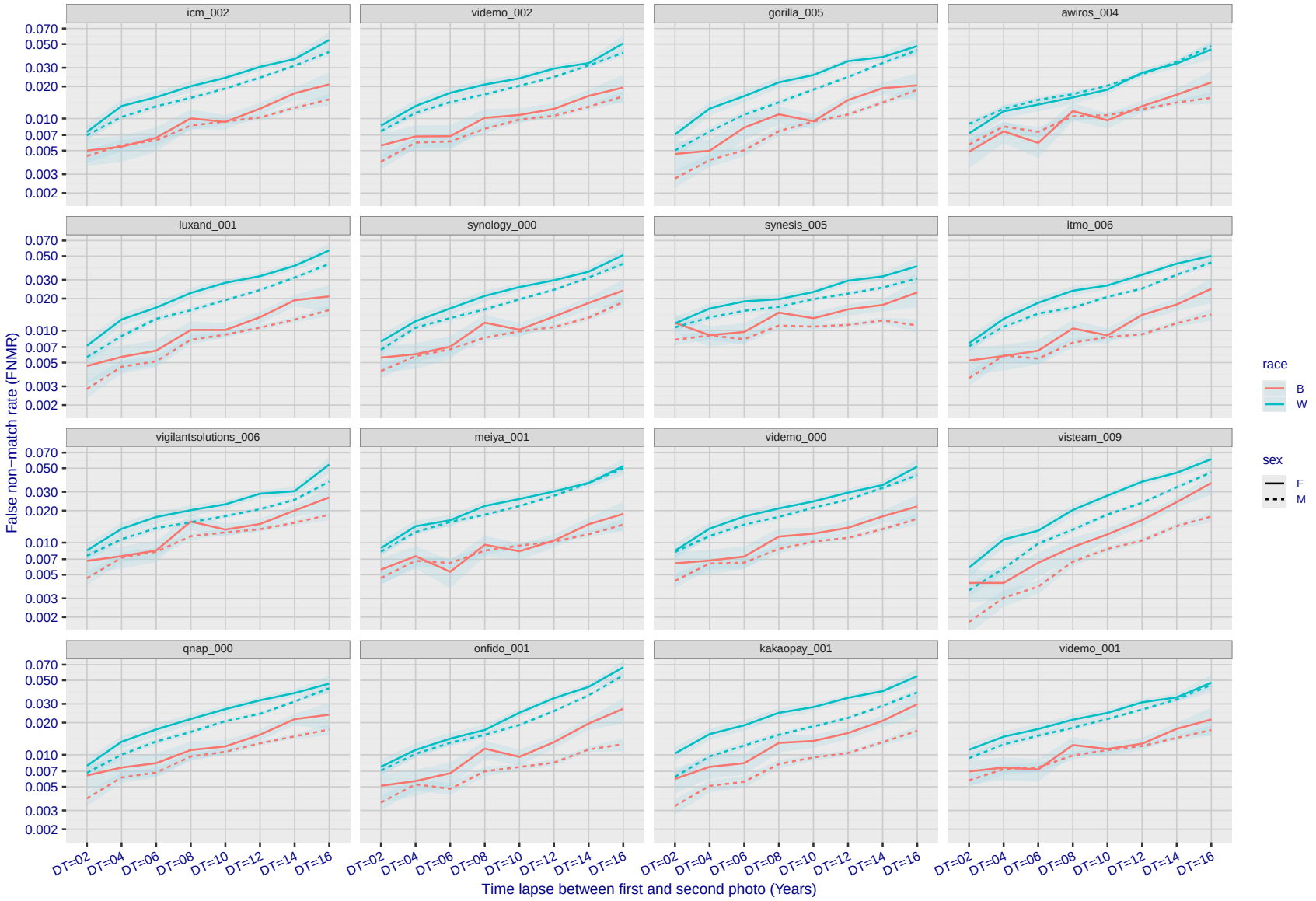

Figure 746: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

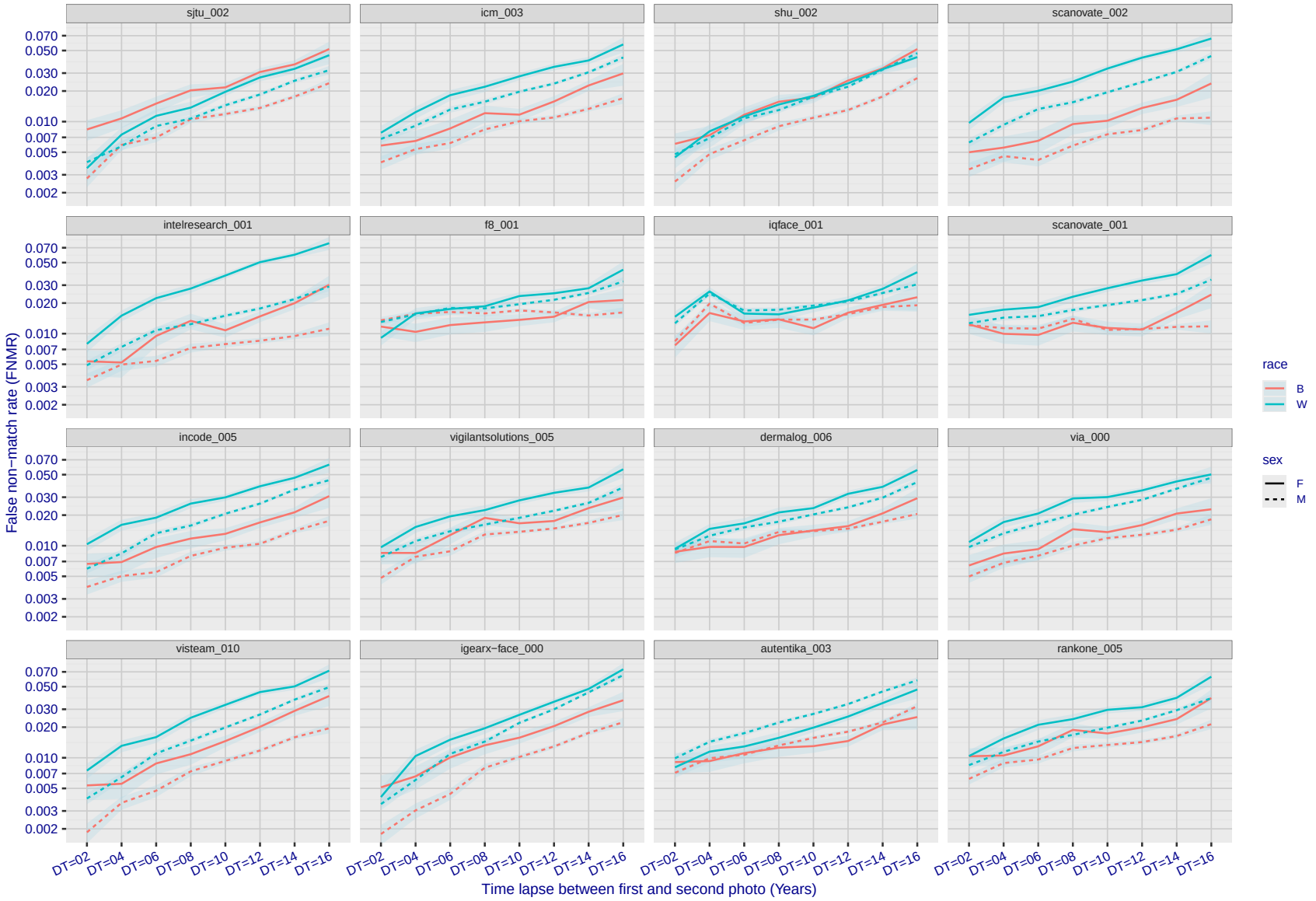

Figure 747: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

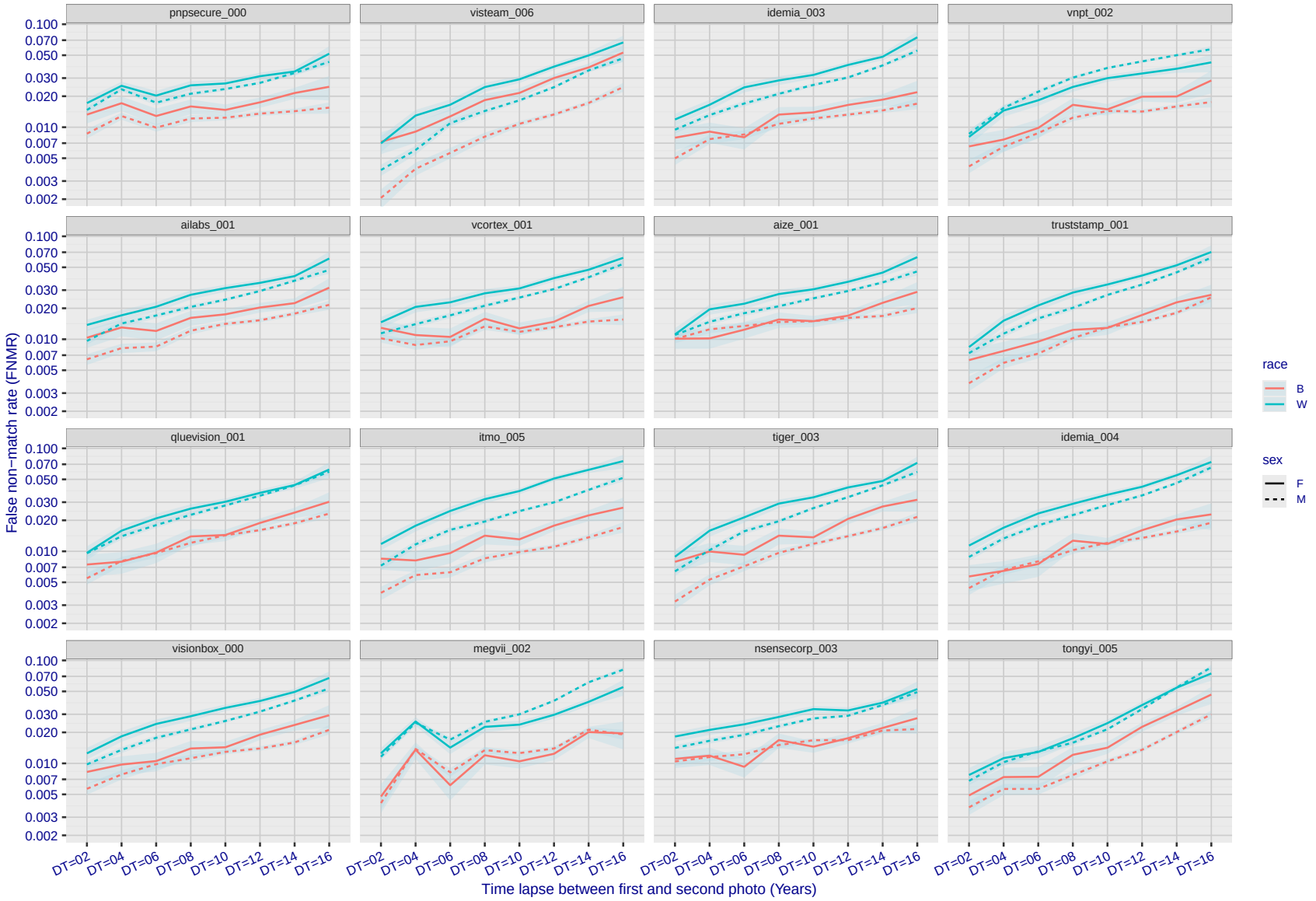

Figure 748: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

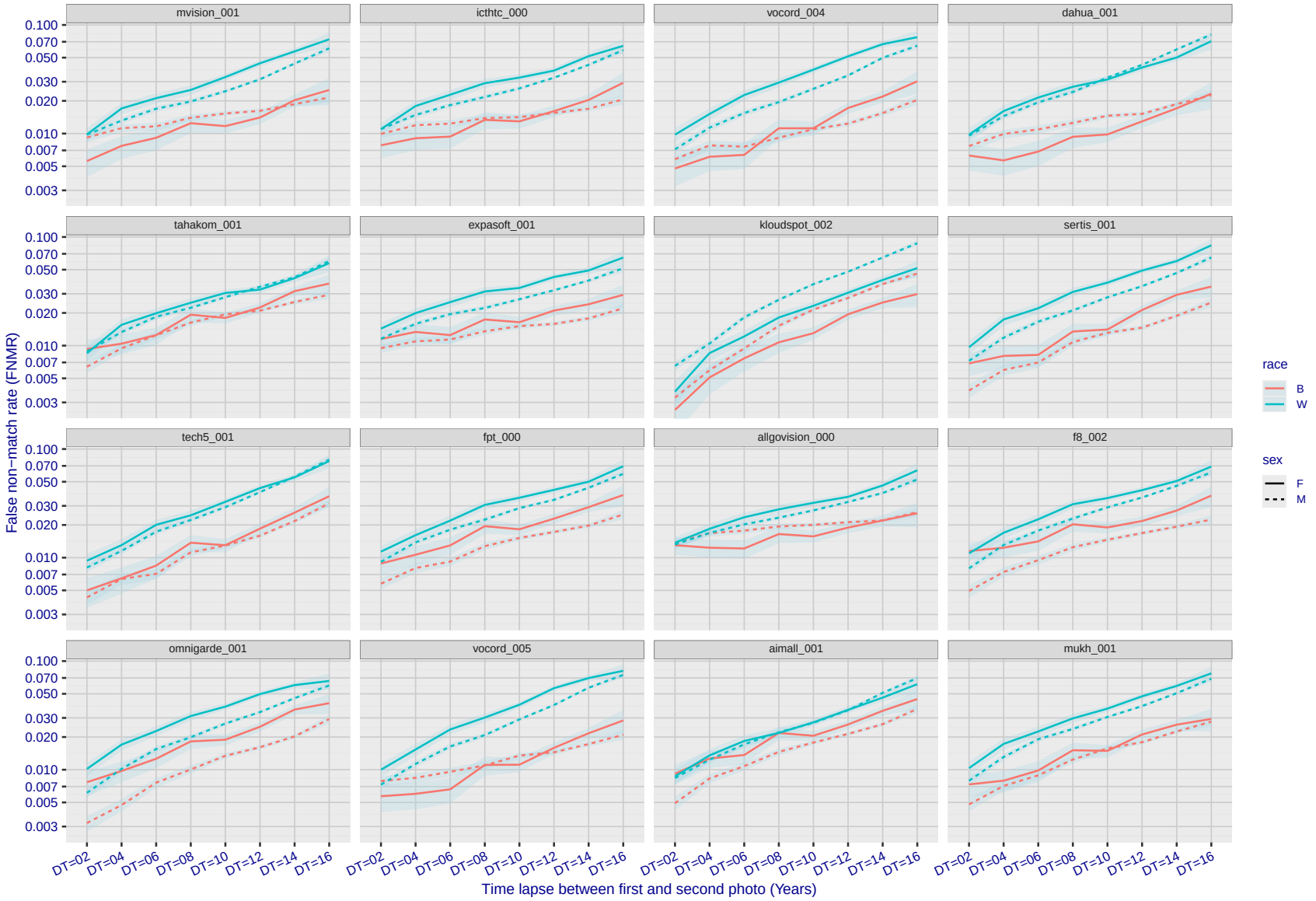

Figure 749: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

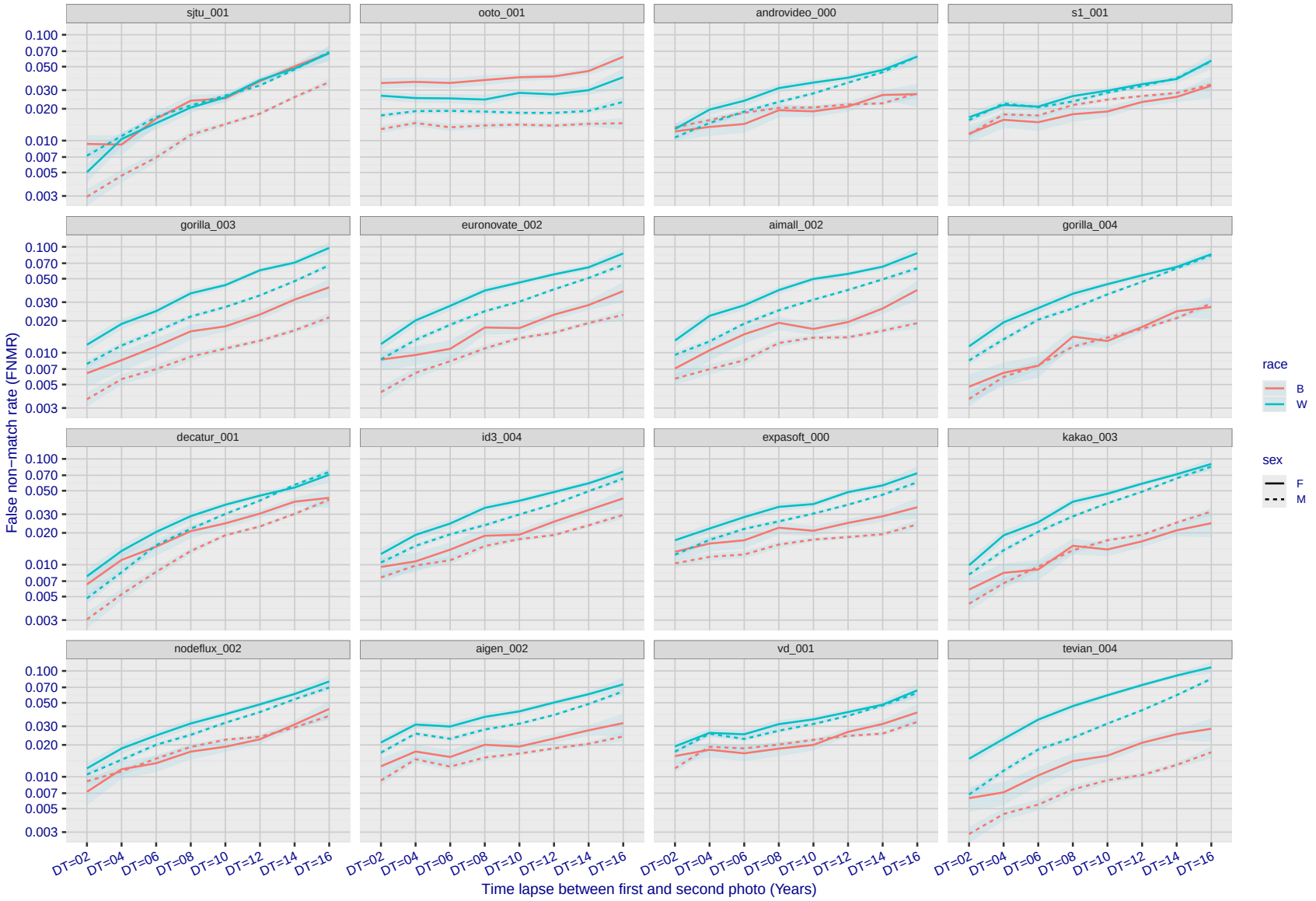

Figure 750: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

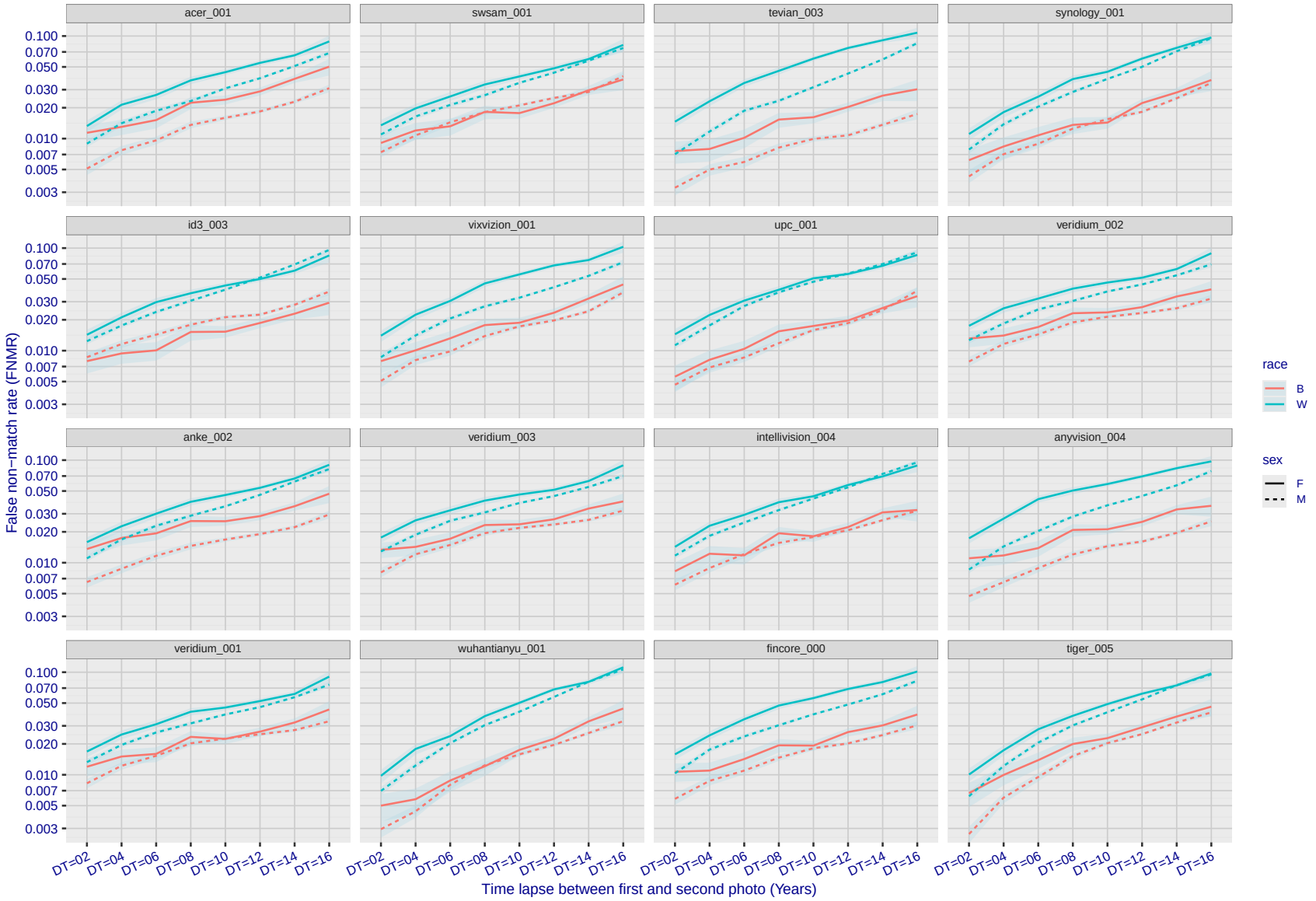

Figure 751: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

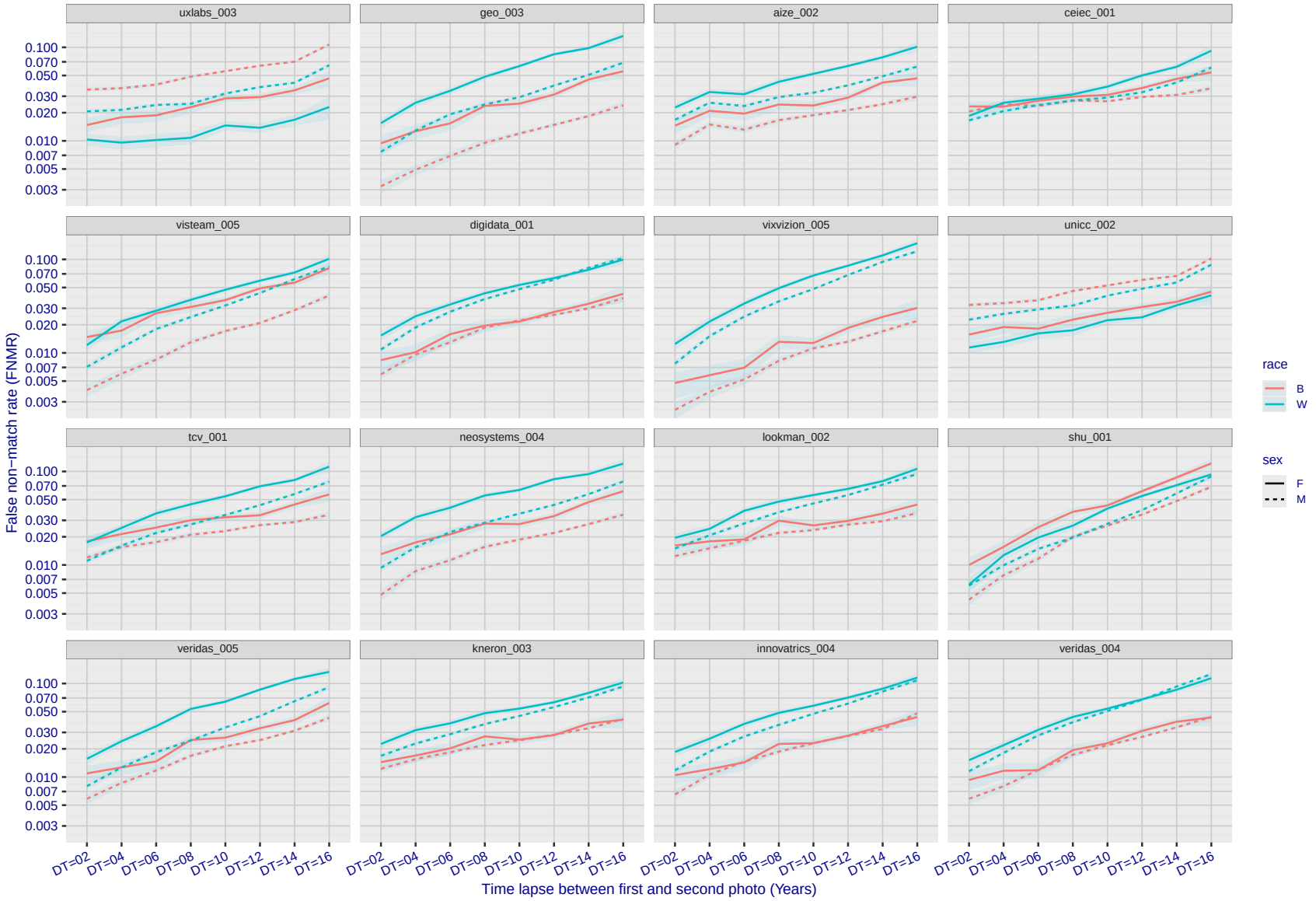

Figure 752: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

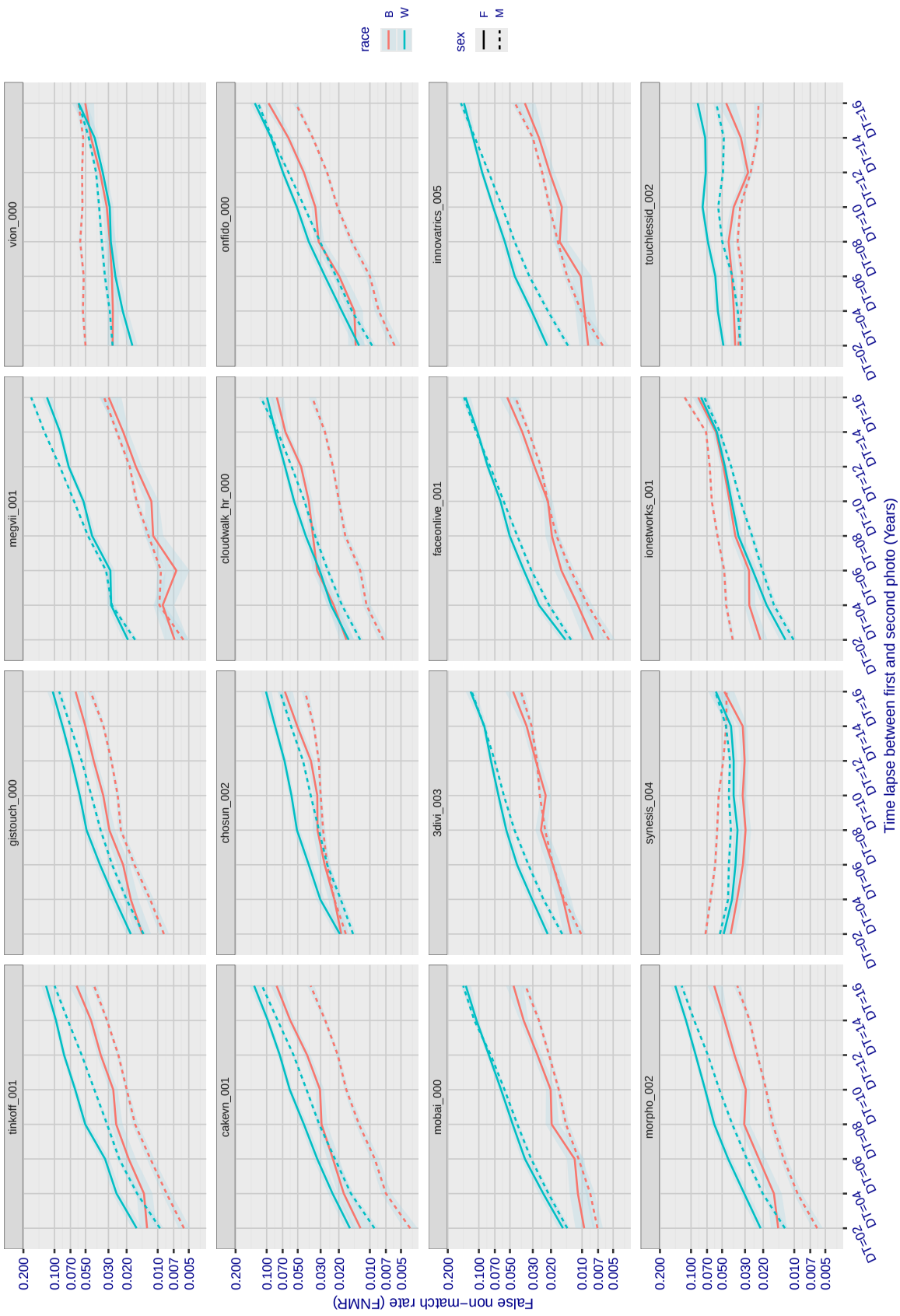

Figure 753: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all* (10^8) *impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (*$FNMR < 0.001$*) so that the uncertainty estimates are high.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

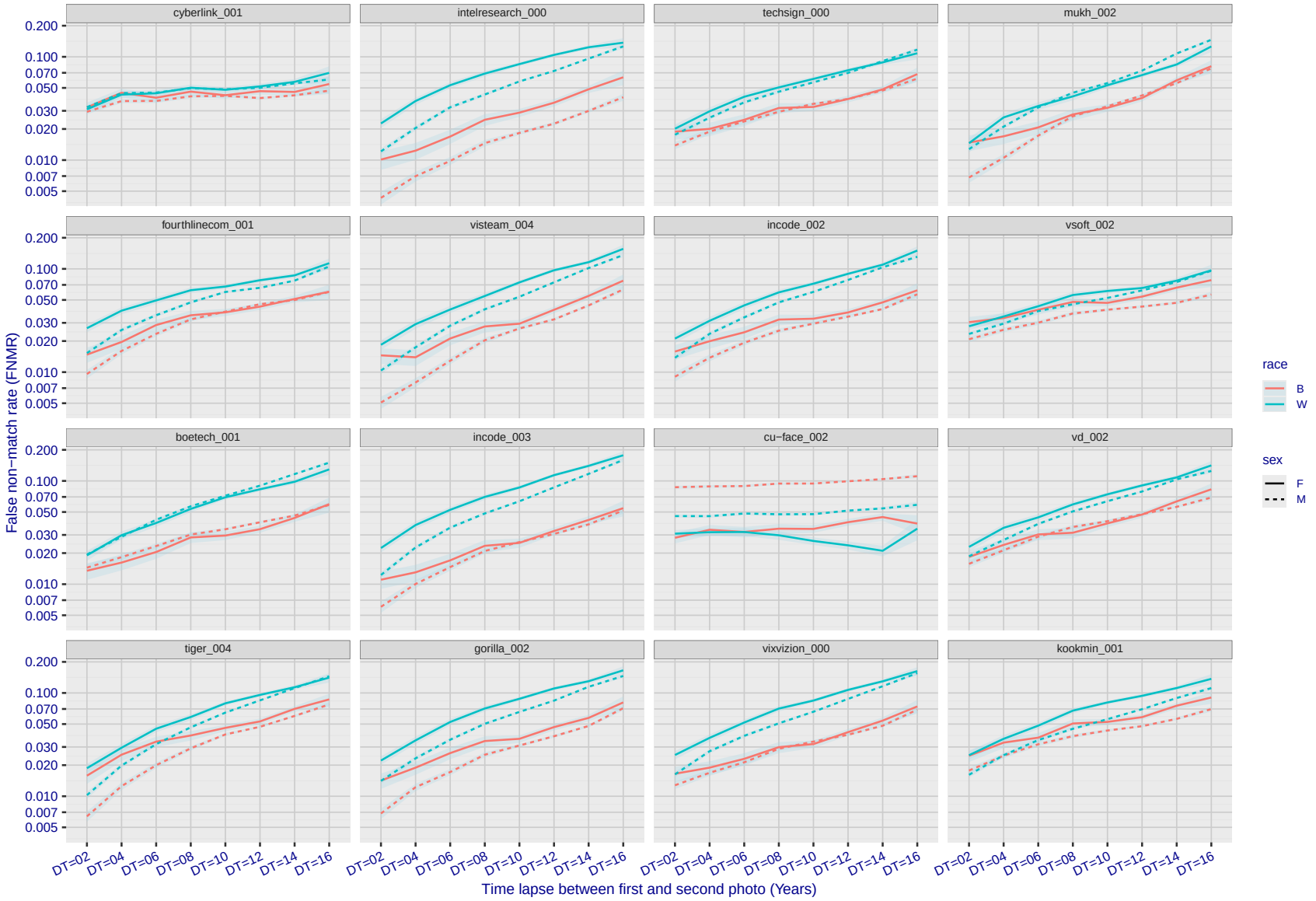

Figure 754: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

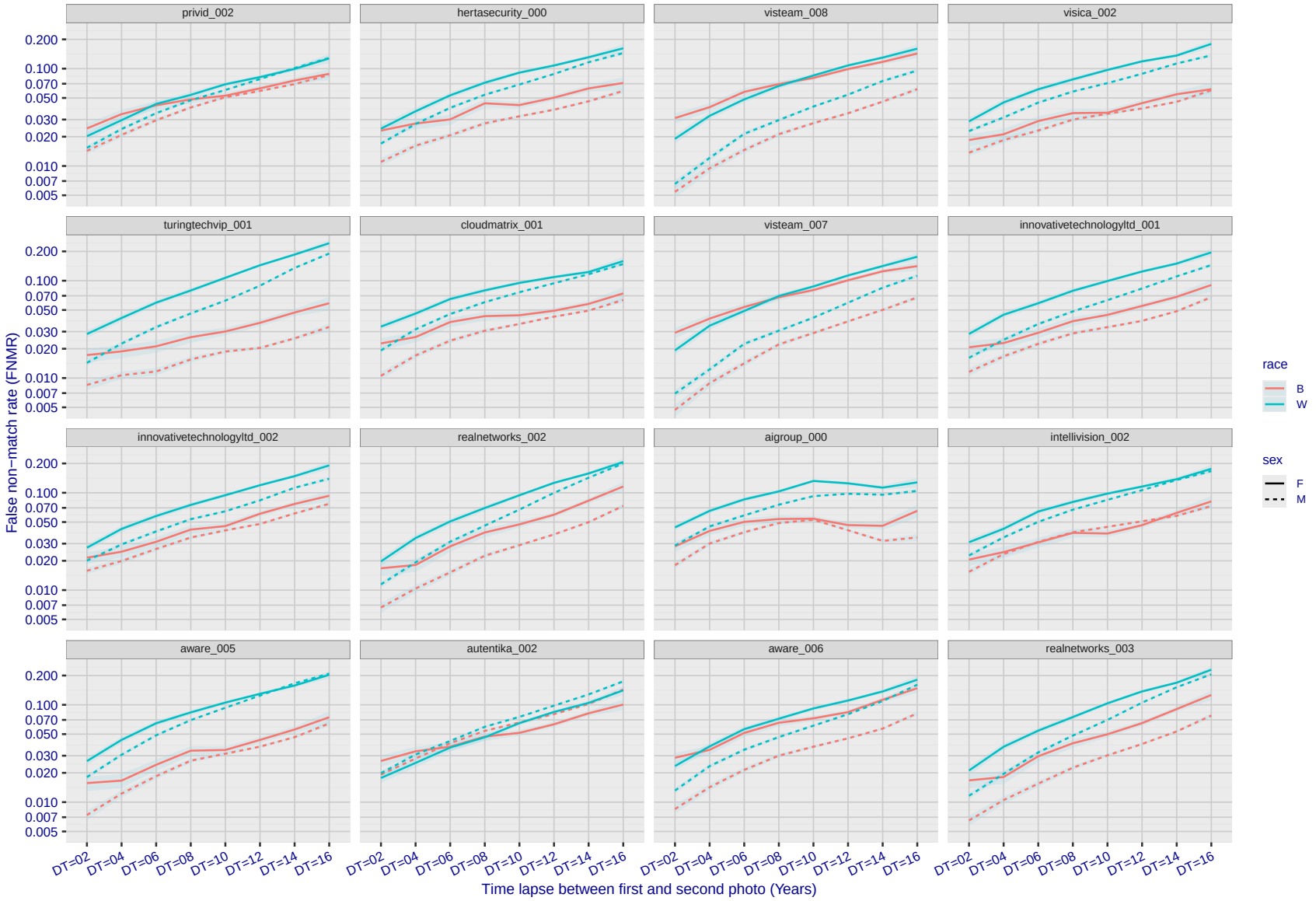

Figure 755: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

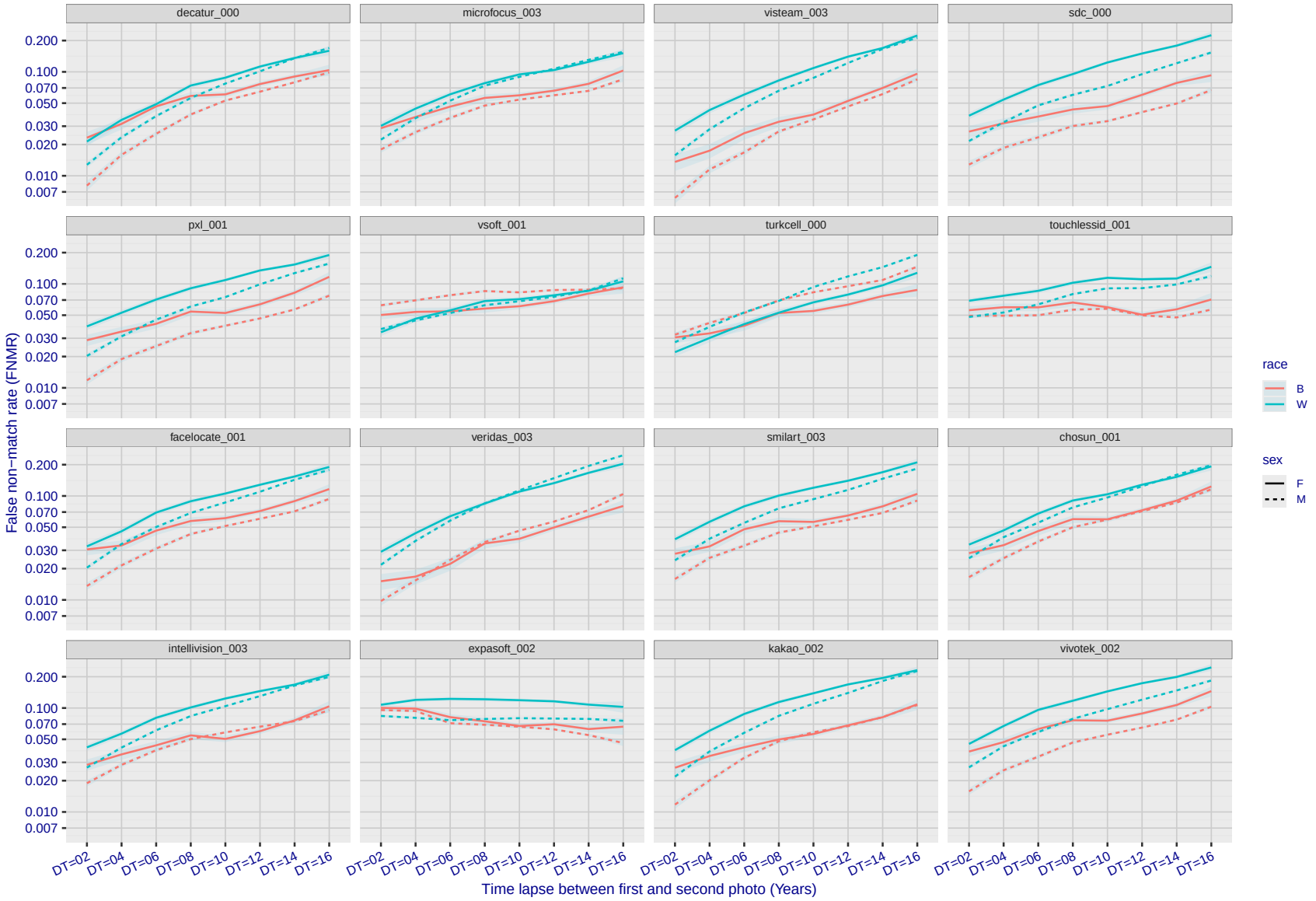

Figure 756: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

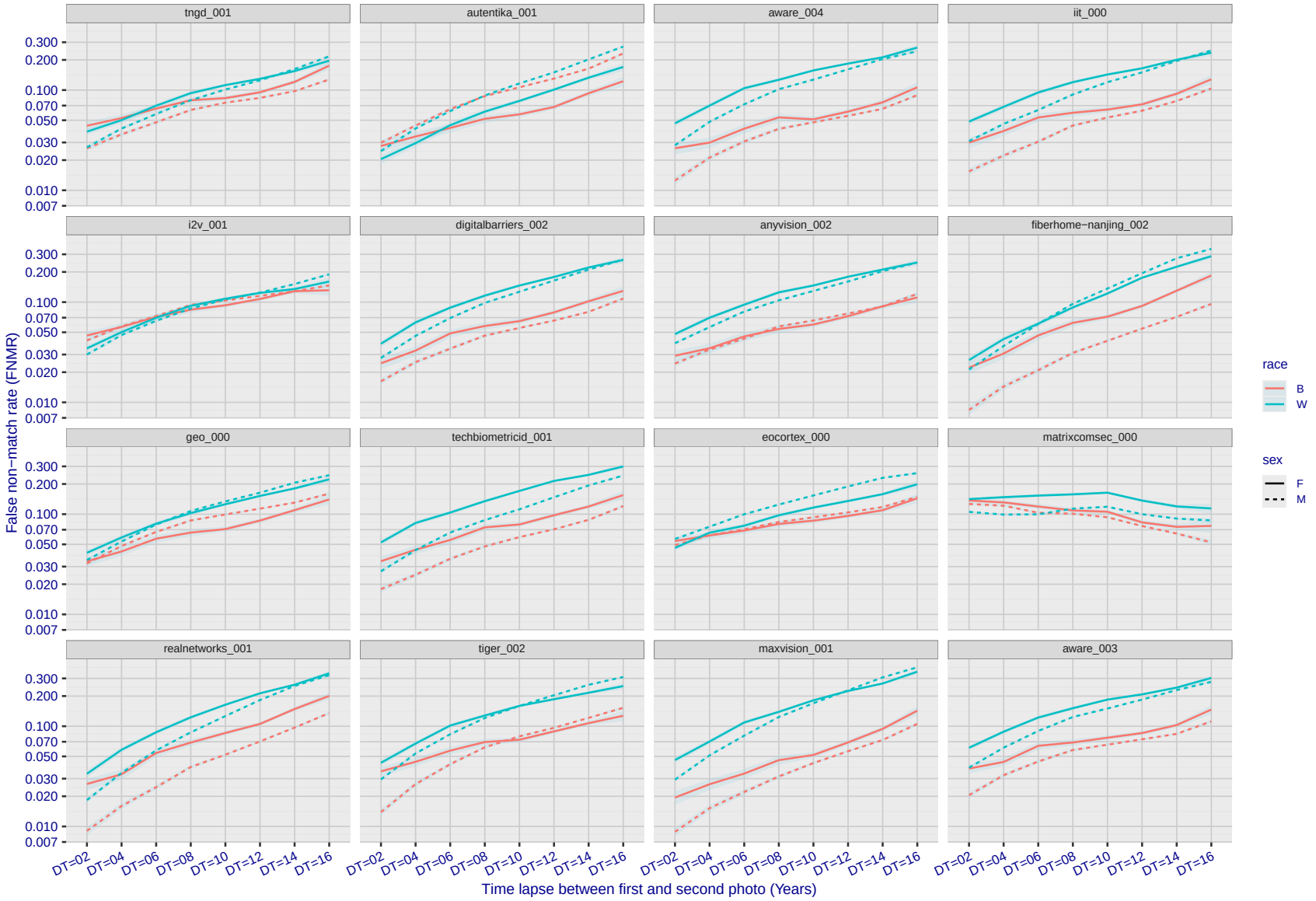

Figure 757: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

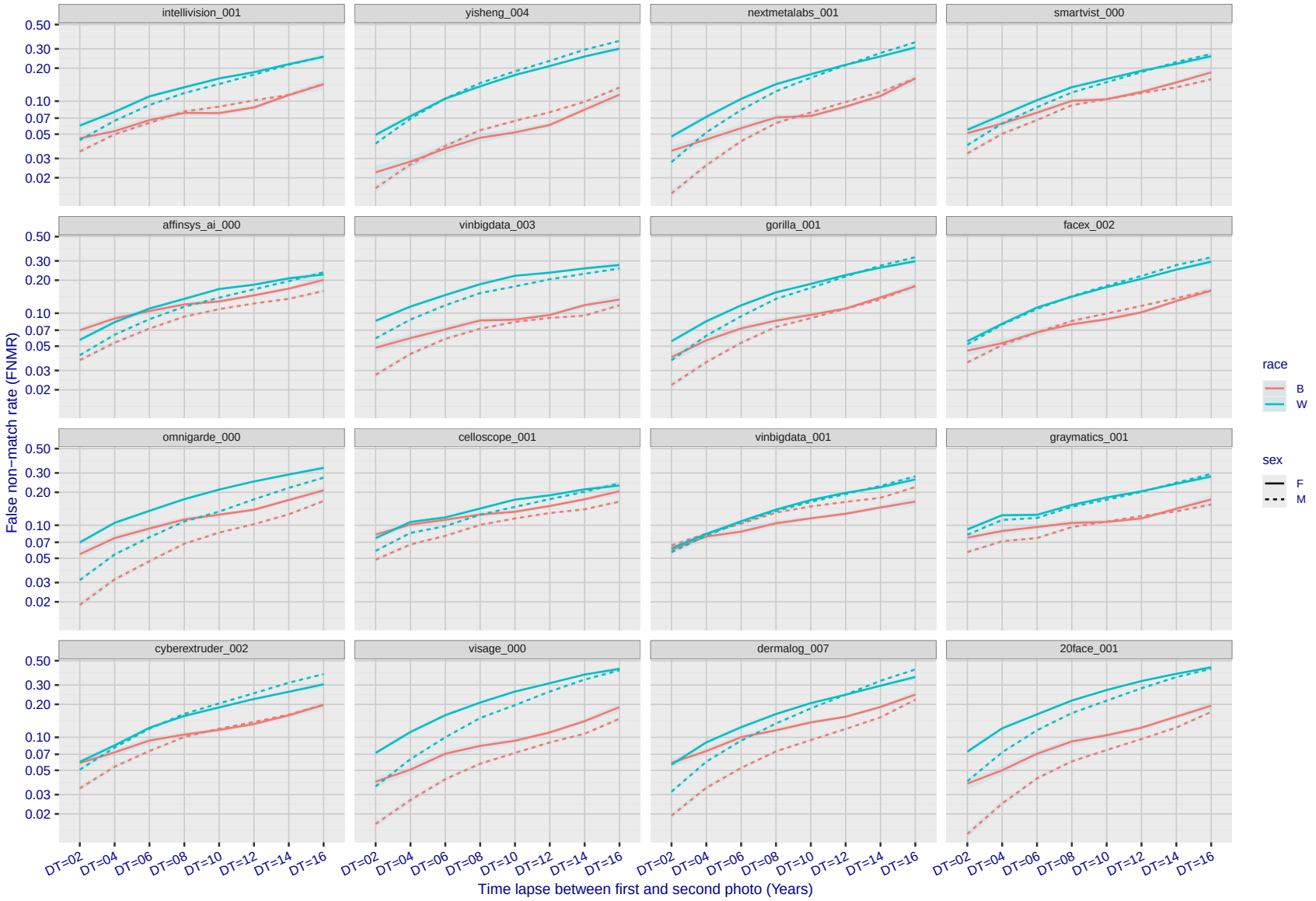

Figure 758: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all* (10^8) *impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR* < 0.001*) so that the uncertainty estimates are high.*

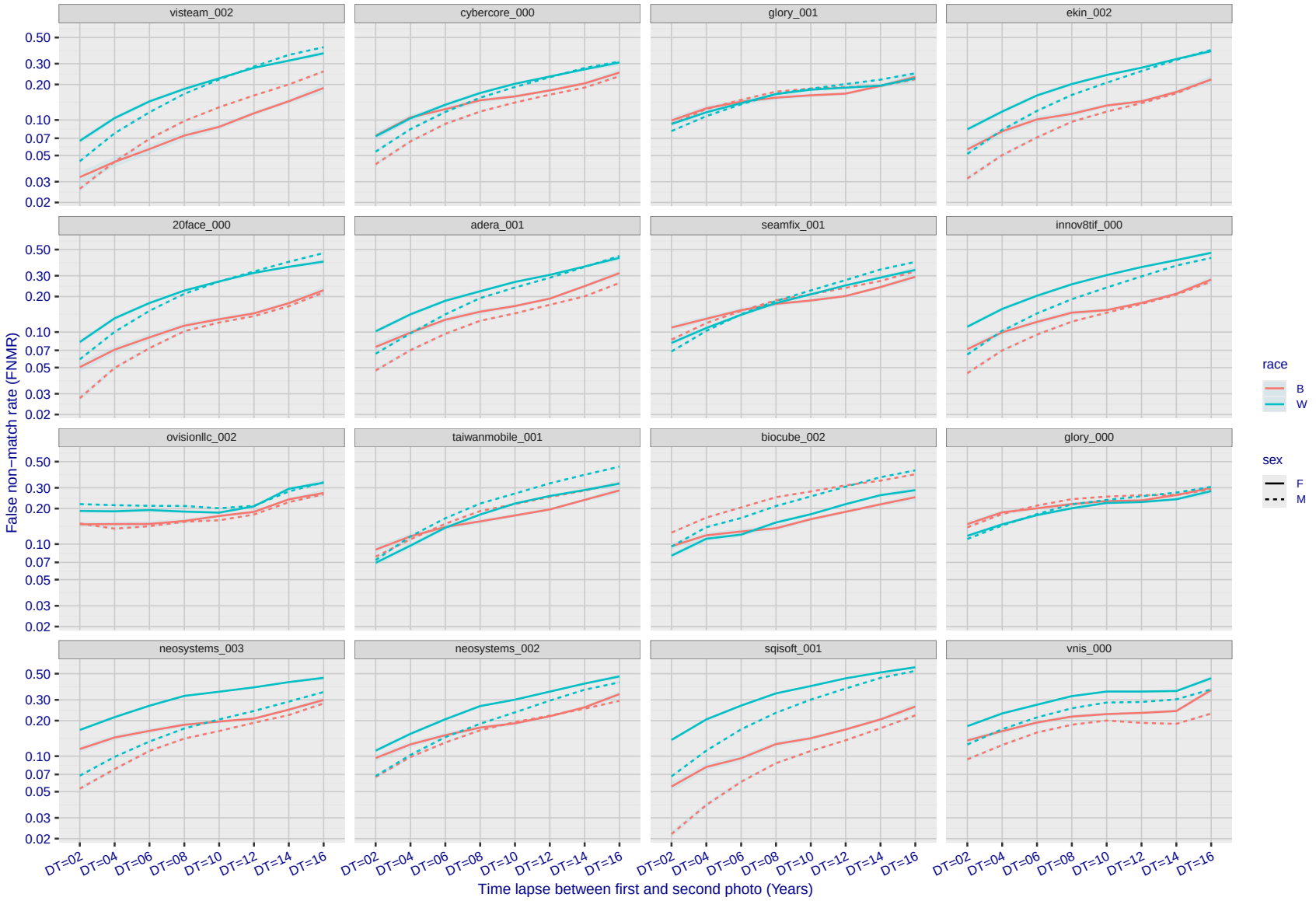

Figure 759: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all* (10^8) *impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR* < 0.001*) so that the uncertainty estimates are high.*

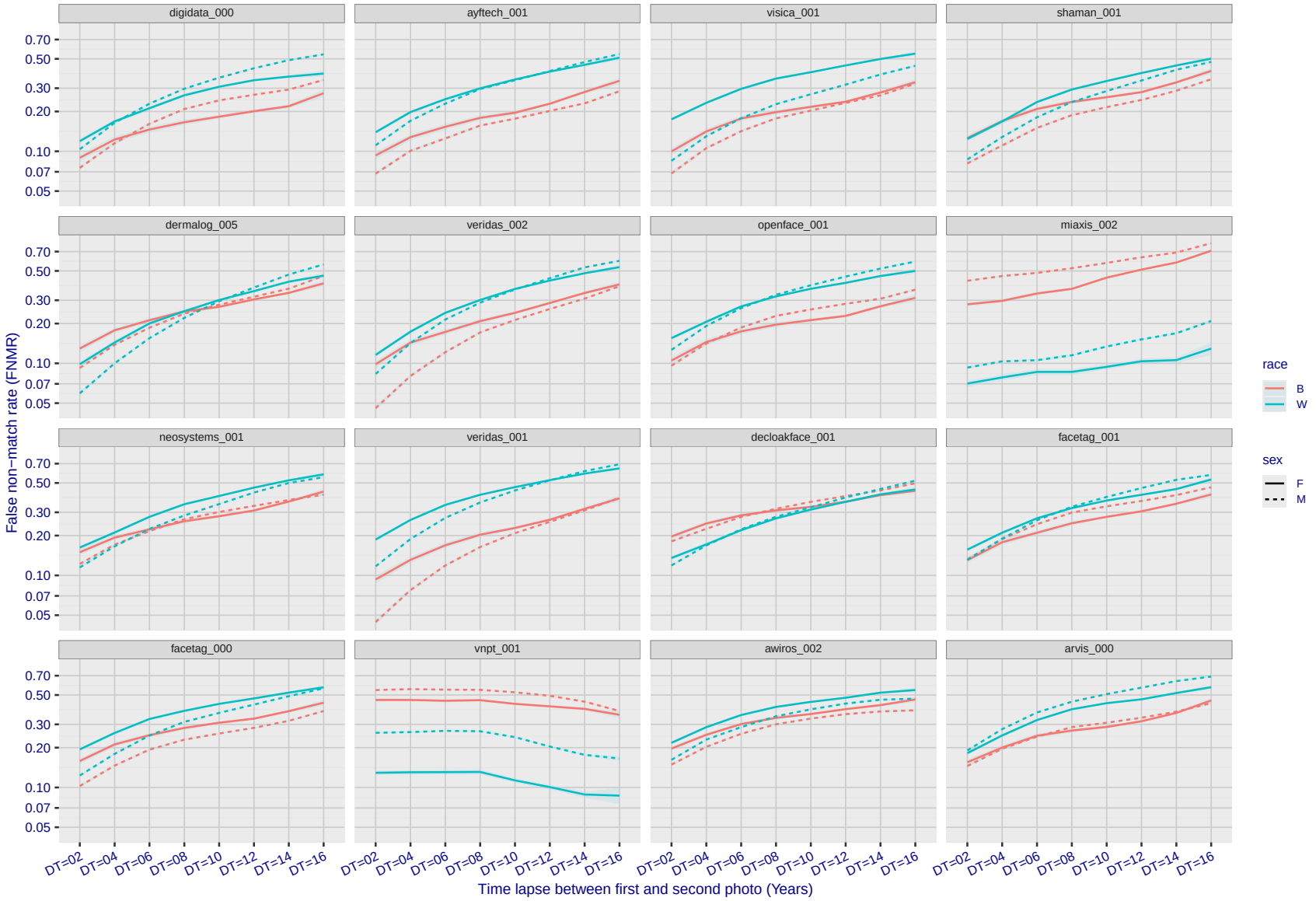

Figure 760: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

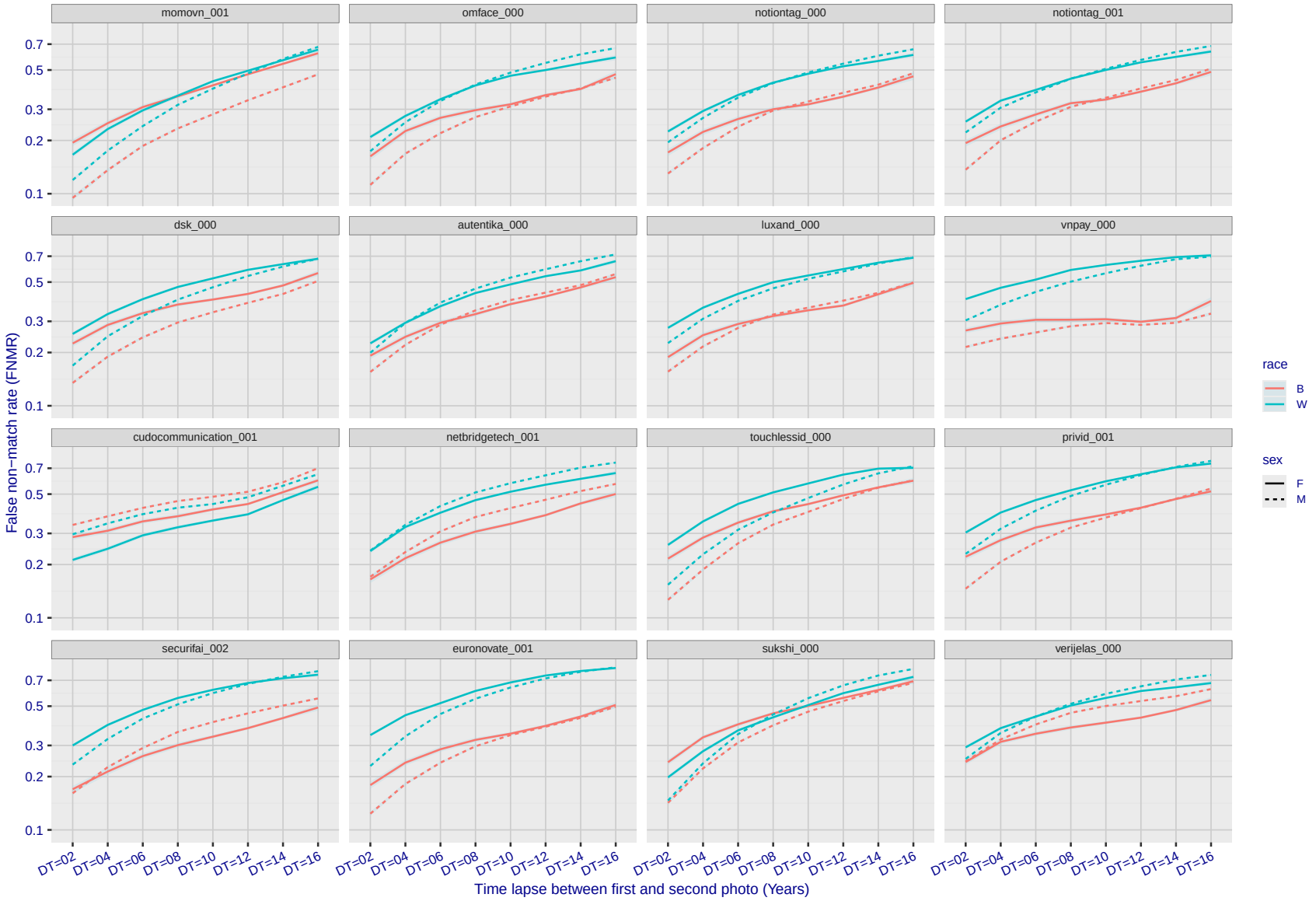

Figure 761: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

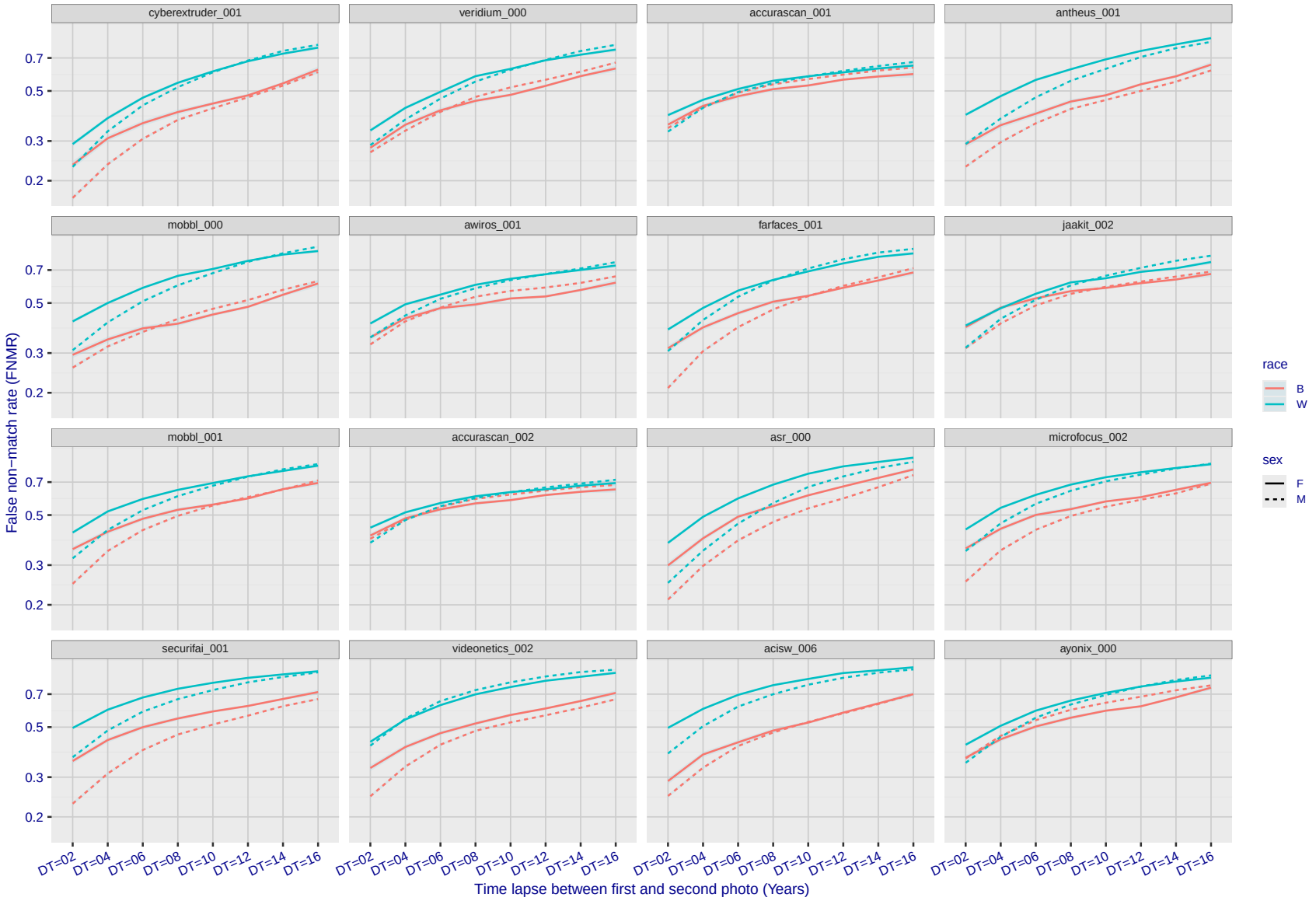

Figure 762: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all* (10^8) *impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR* < 0.001*) so that the uncertainty estimates are high.*

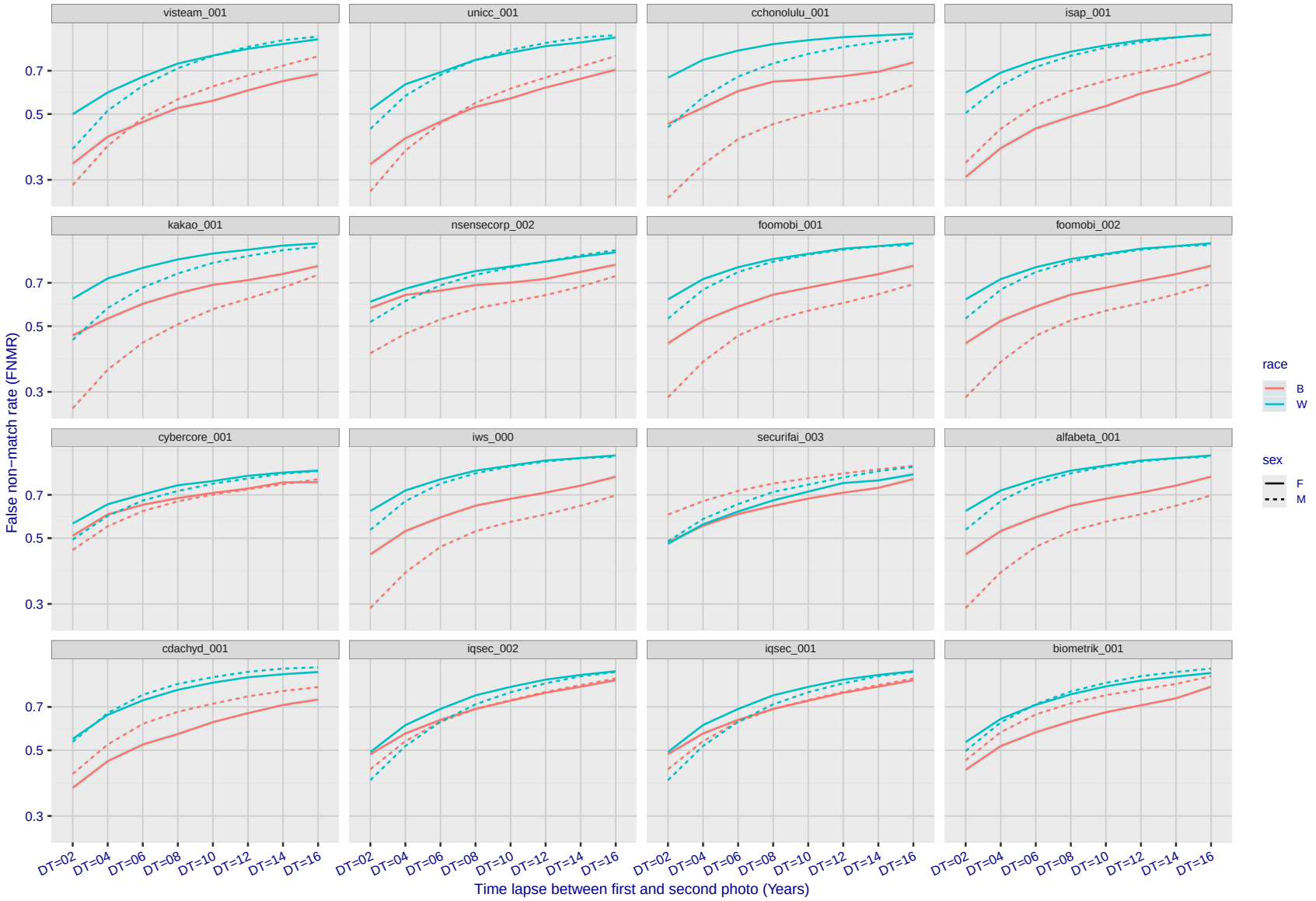

Figure 763: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

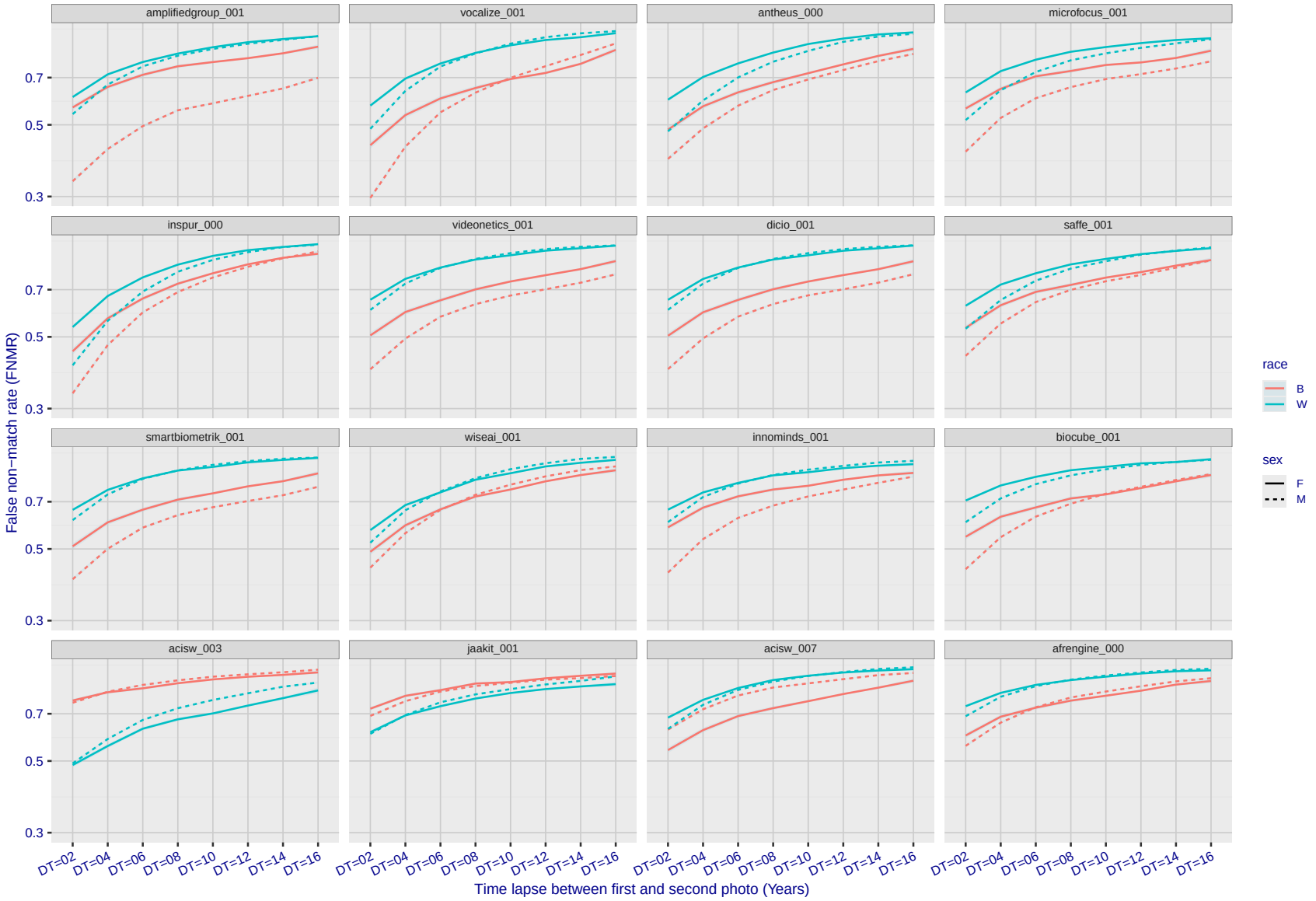

Figure 764: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all* (10^8) *impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR* < 0.001*) so that the uncertainty estimates are high.*

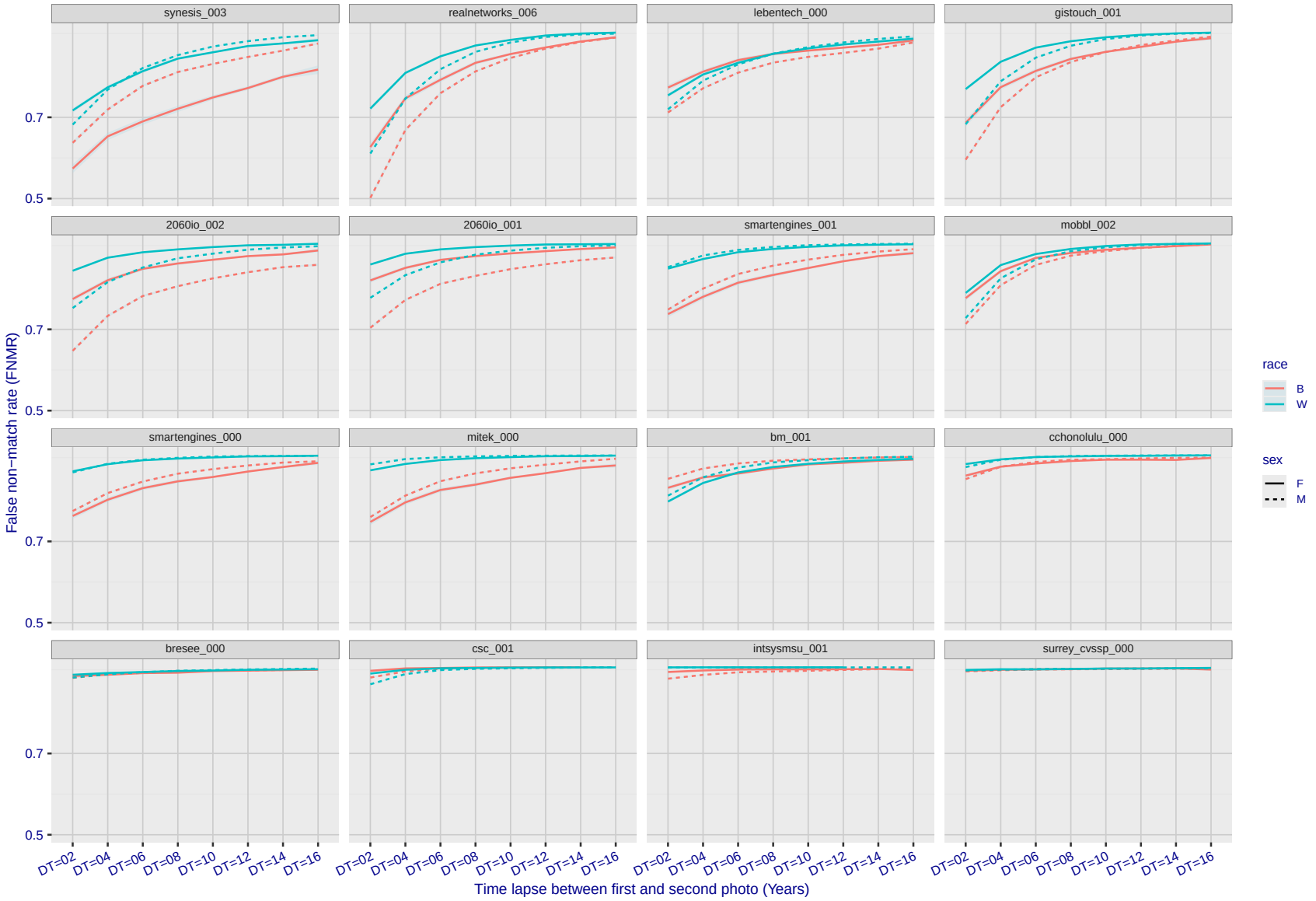

Figure 765: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

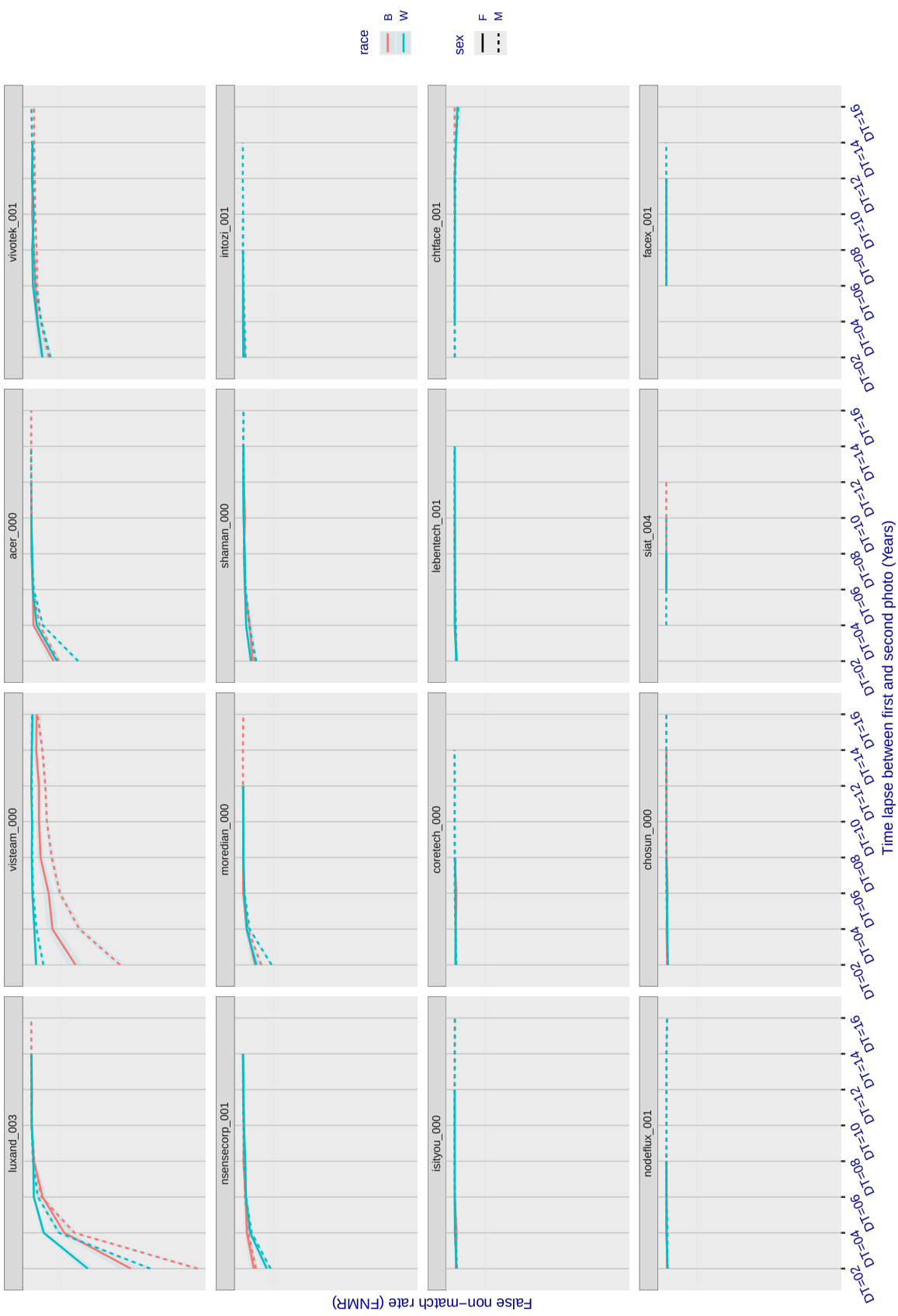

Figure 766: For the mugshot images, FNMR *as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.*

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 767: For the mugshot images, FNMR as a function of elapsed time between initial enrollment and second verification images. The panels appear most accurate first, and vertical scale changes on each page. The four traces correspond to images annotated with codes for black female, black male, white female, white male. The threshold is fixed for each algorithm to give FMR = 0.00001 over all (10^8) impostor comparisons. For short time-lapses, the most accurate algorithms give very few errors (FNMR < 0.001) so that the uncertainty estimates are high.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.5.3 Effect of age on genuine subjects

Background: Faces change appearance throughout life. Face recognition algorithms have previously beeen reported to give better accuracy on older individuals (See NIST IR 8009).

Goal: To quantify false non-match rates (FNMR) as a function of age, without an ageing component.

Methods: Using the visa images, which span fewer than five years, thresholds are determined that give FMR = 0.001 and 0.0001 over the entire impostor set. Then FNMR is measured over 1000 bootstrap replications of the genuine scores.

Results: For the visa images, Figure 858 shows how false non-match rates for genuine users, as a function of age group.

The notable aspects are:

- Younger subjects give considerably higher FNMR. This is likely due to rapid growth and change in facial appearance.
- FNMR trends down throughout life. The last bin, AGE $>$ 72, contains fewer than 140 mated pairs, and may be affected by small sample size.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 768: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 769: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 770: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 771: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 772: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

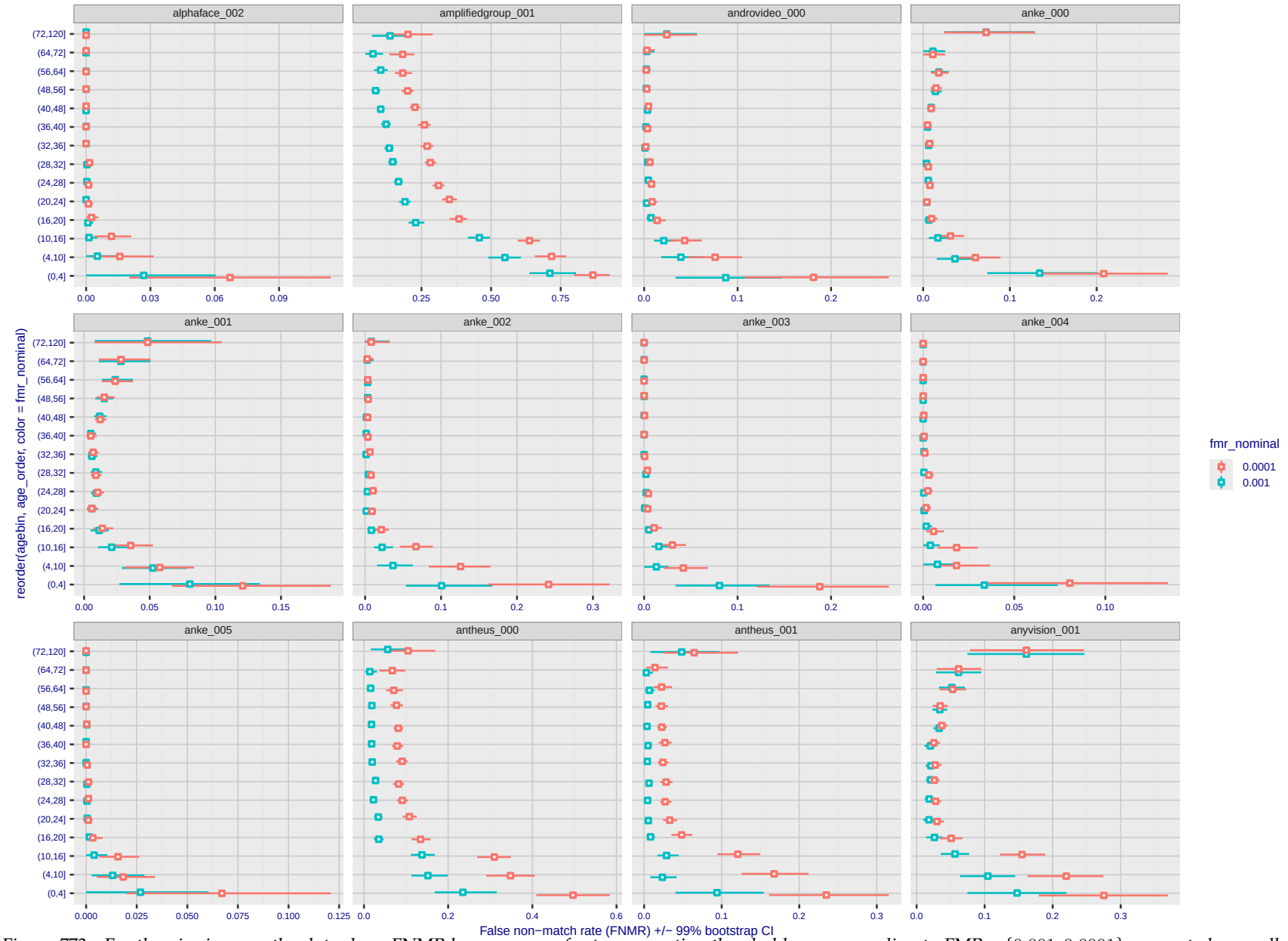

Figure 773: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 774: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 775: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 776: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 777: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 778: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

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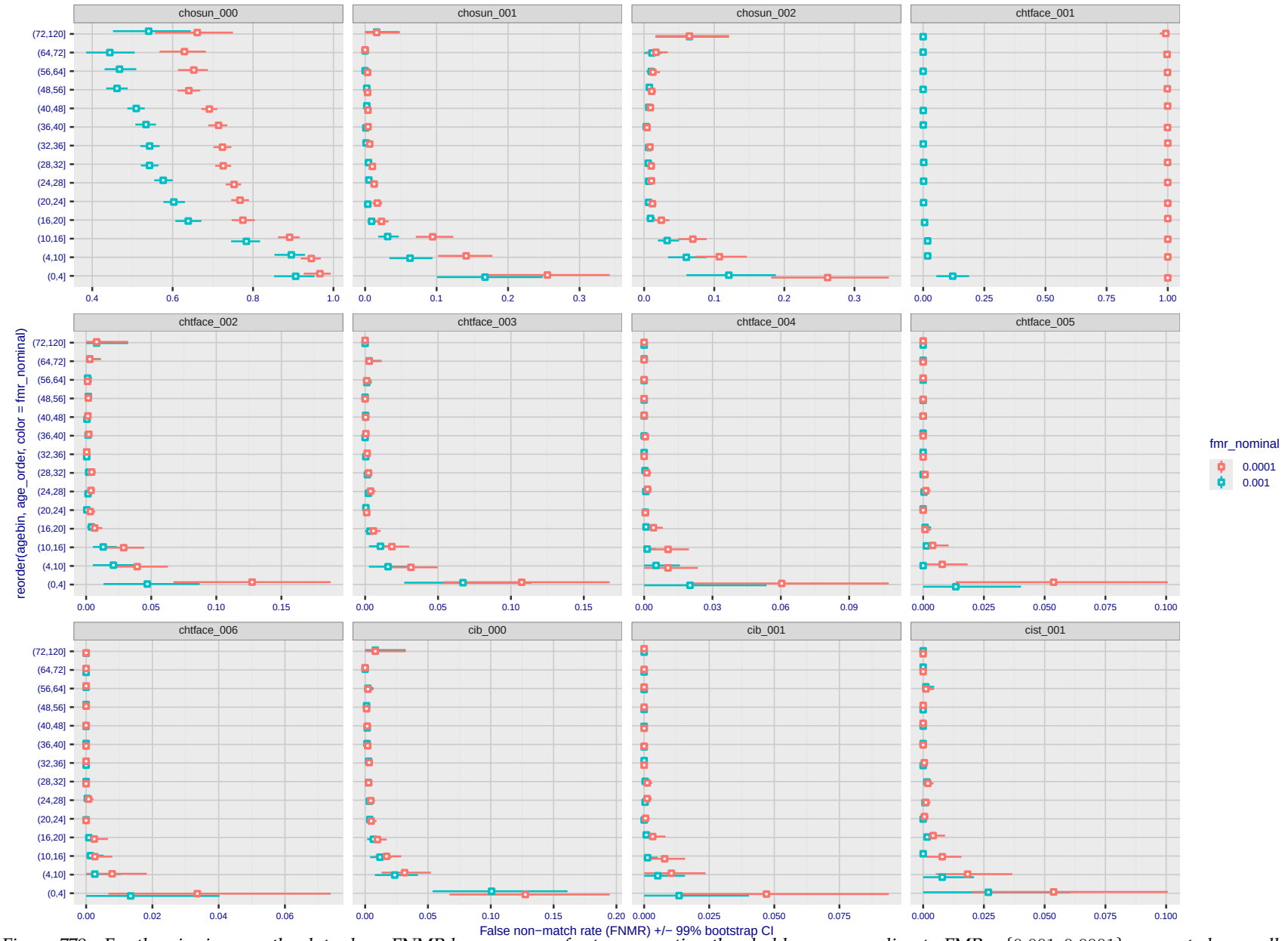

Figure 779: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 780: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 781: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

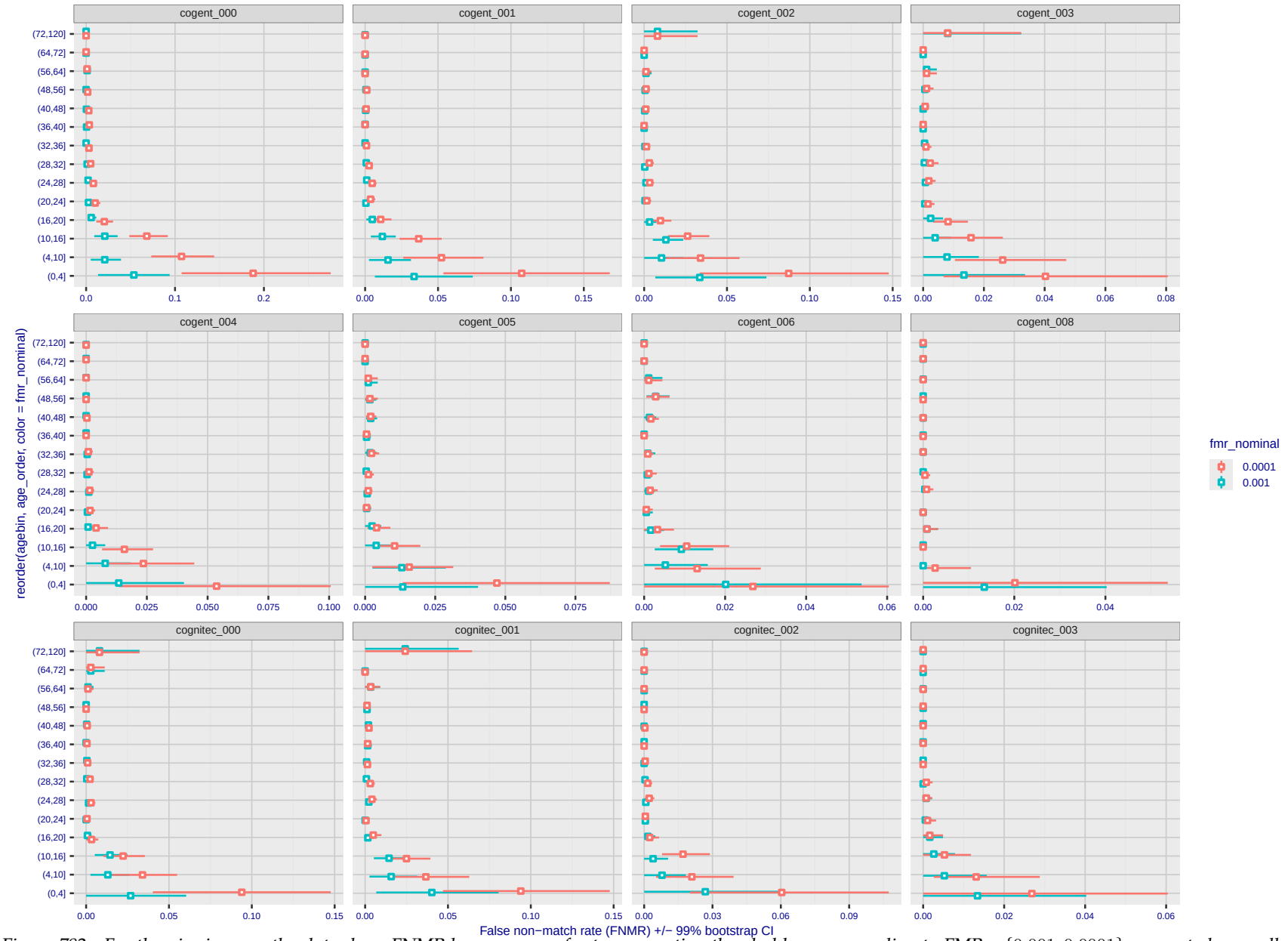

Figure 782: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 783: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 784: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 785: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

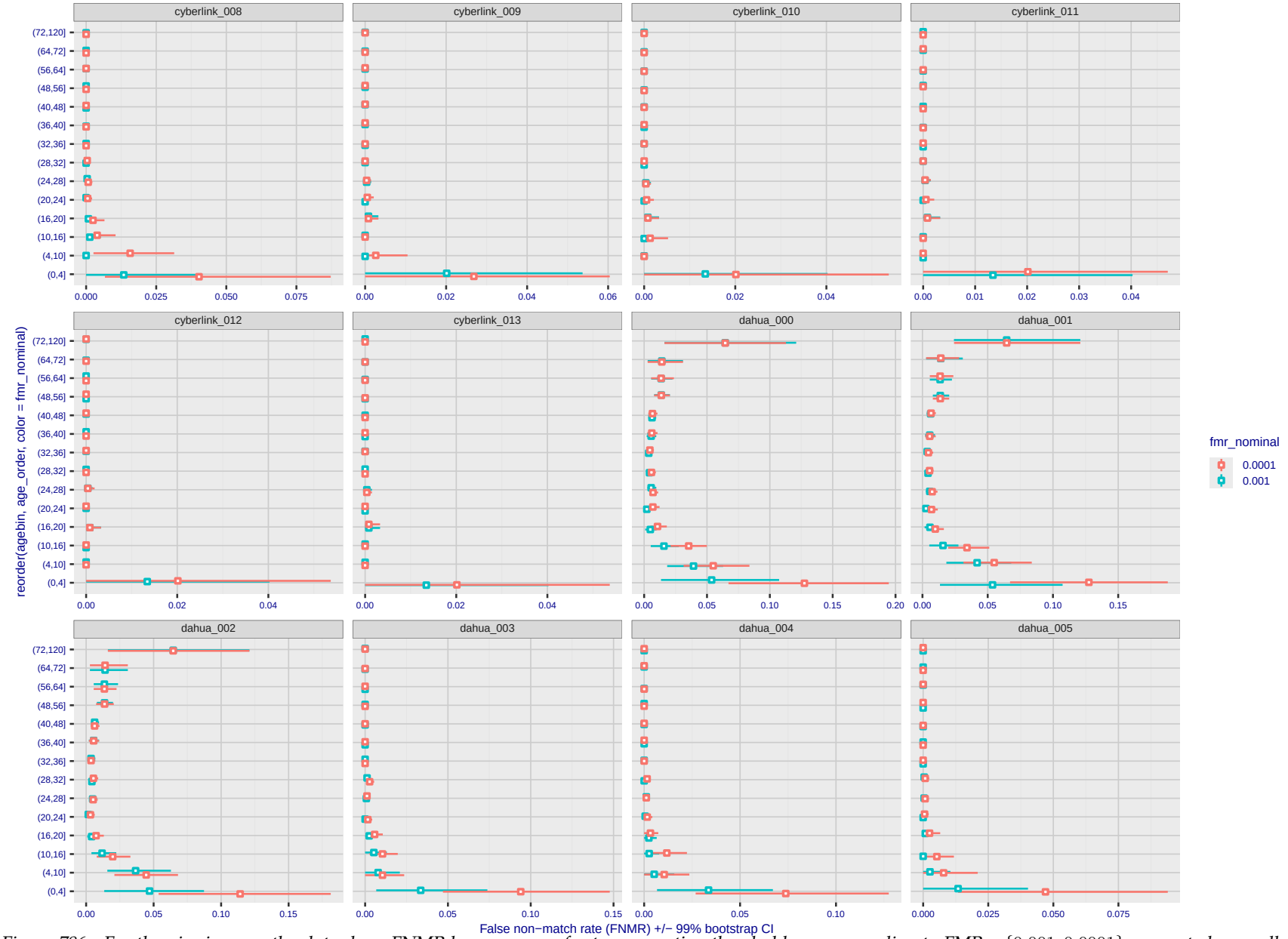

Figure 786: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

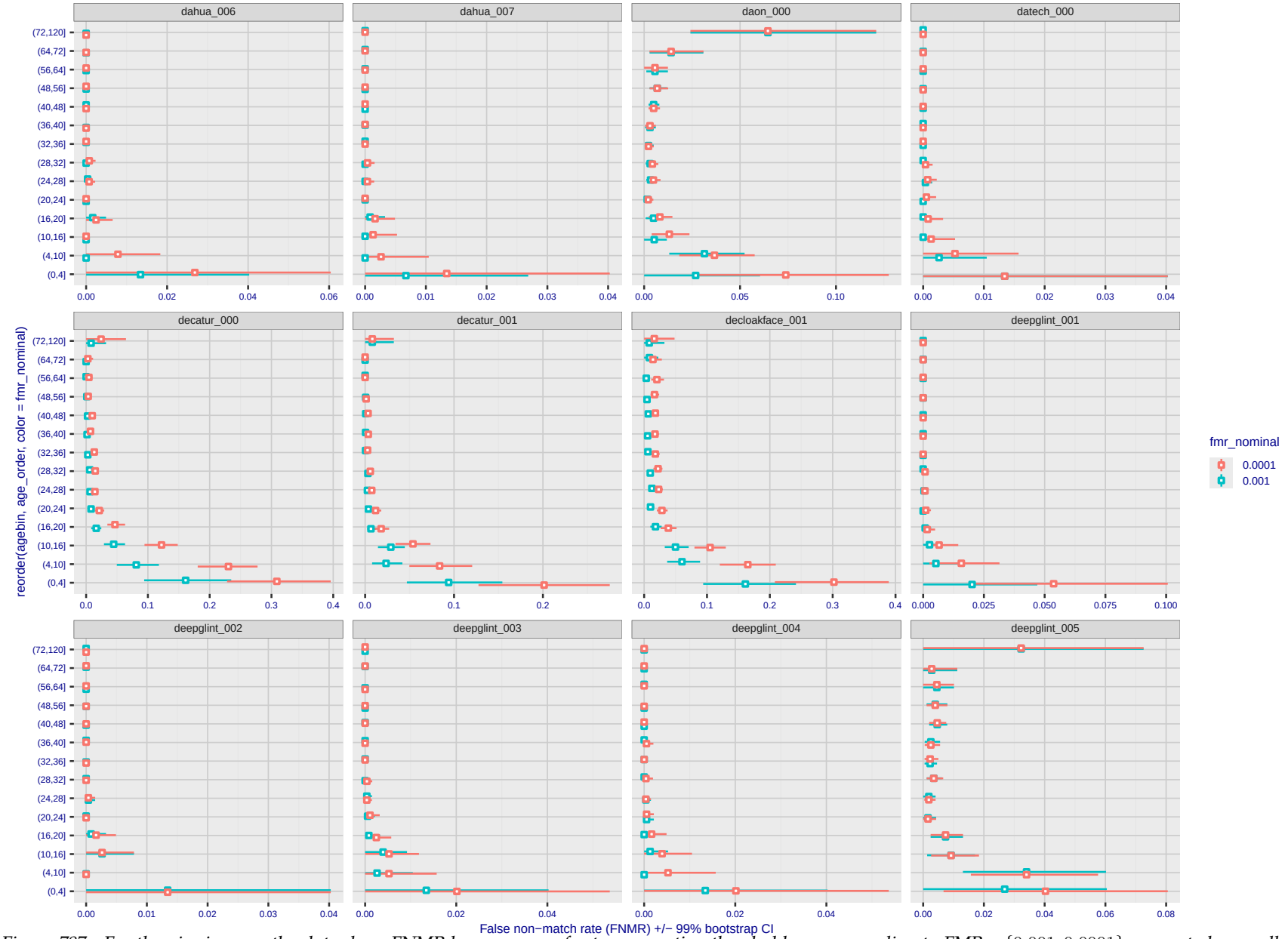

Figure 787: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 788: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

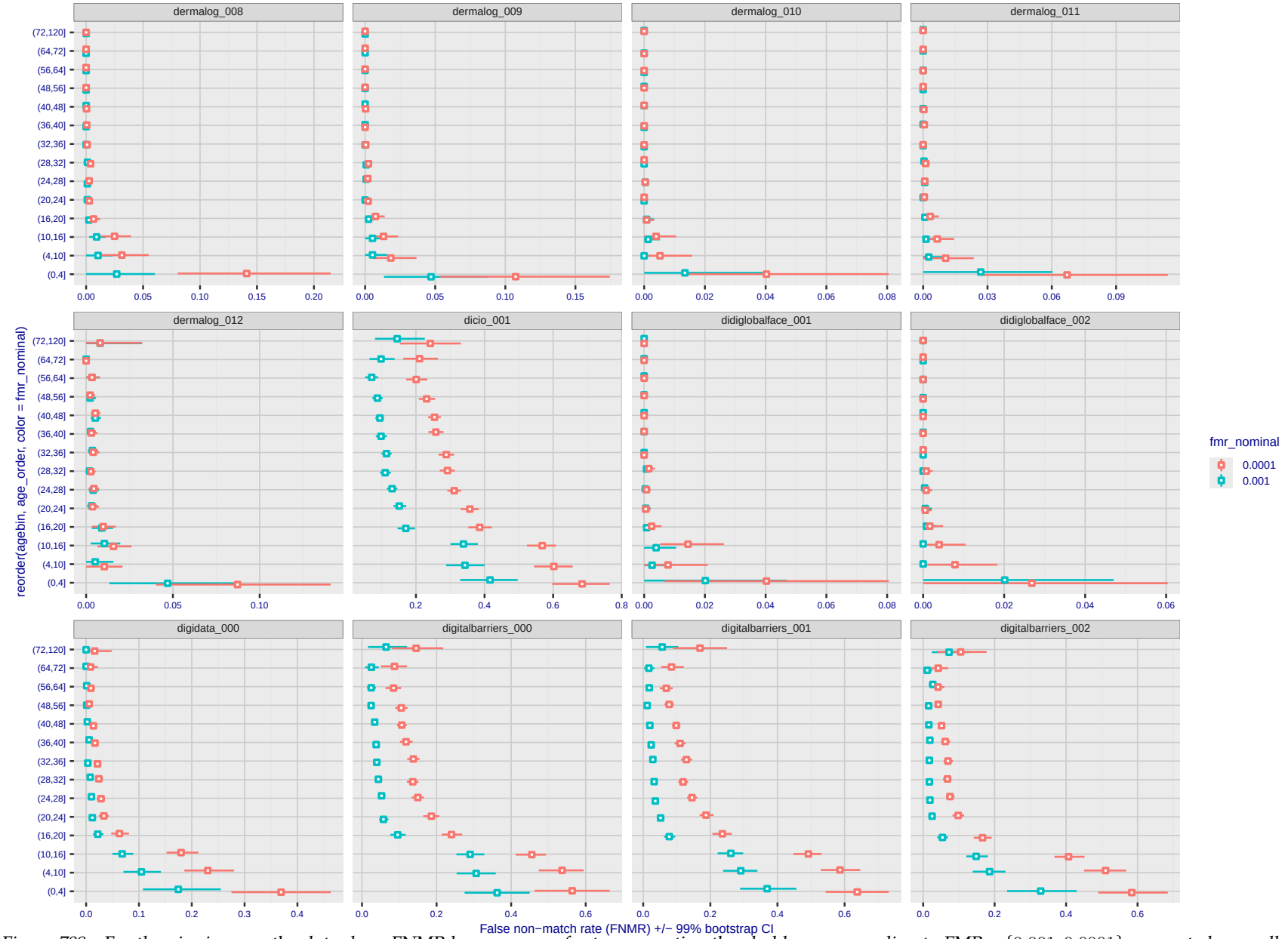

Figure 789: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

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Figure 790: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

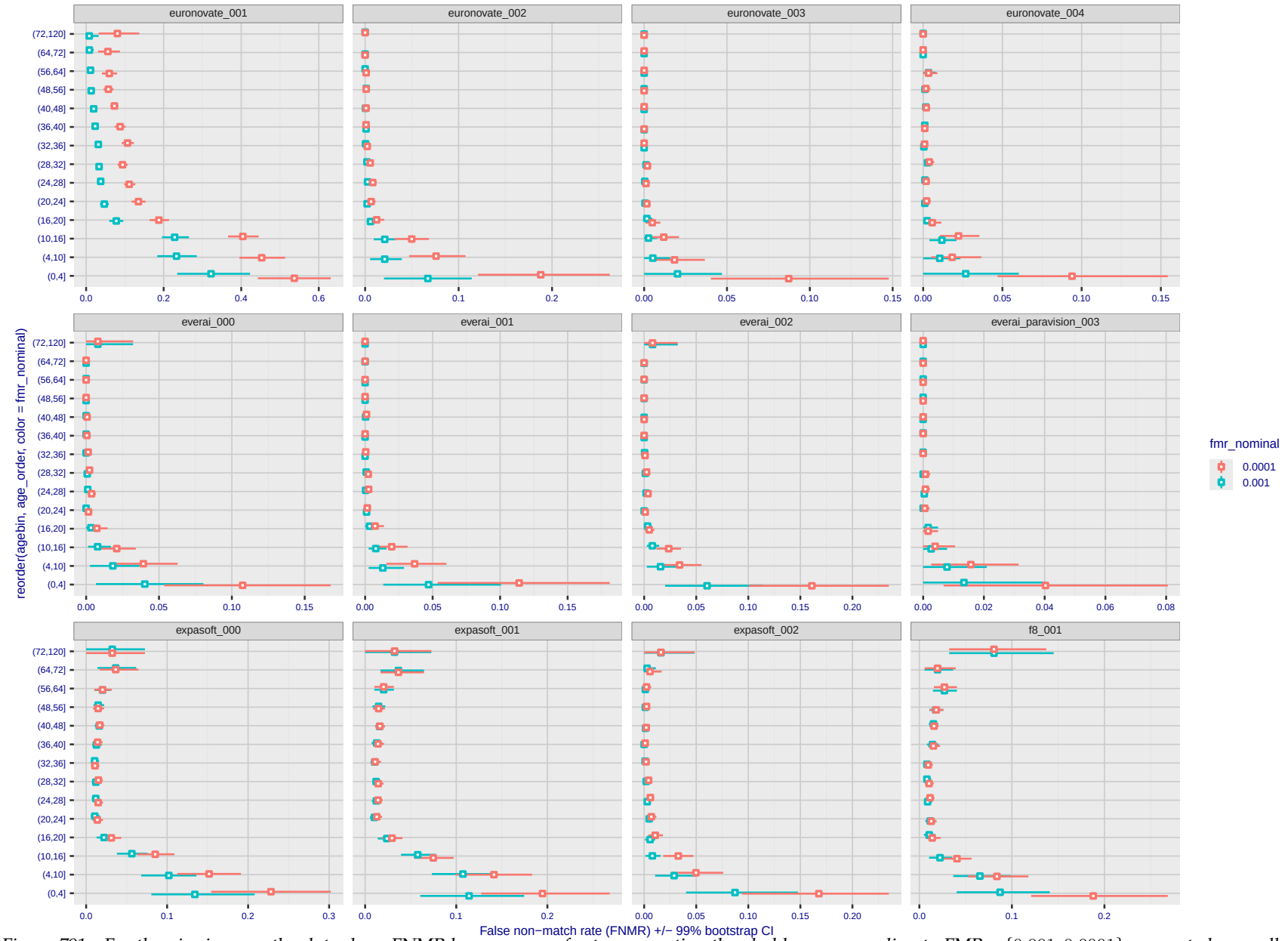


Figure 791: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 792: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

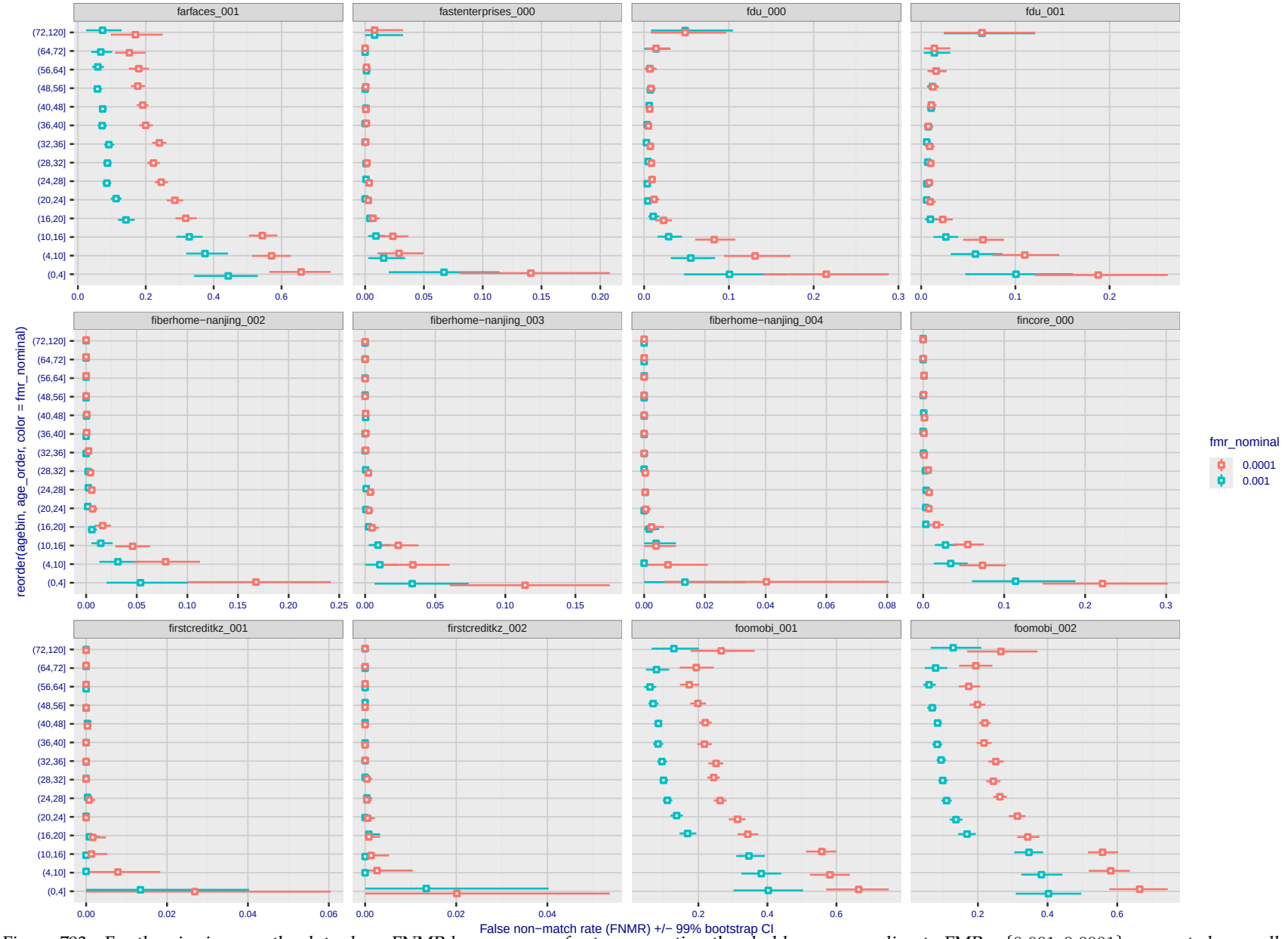


Figure 793: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 794: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 795: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 796: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 797: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 798: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

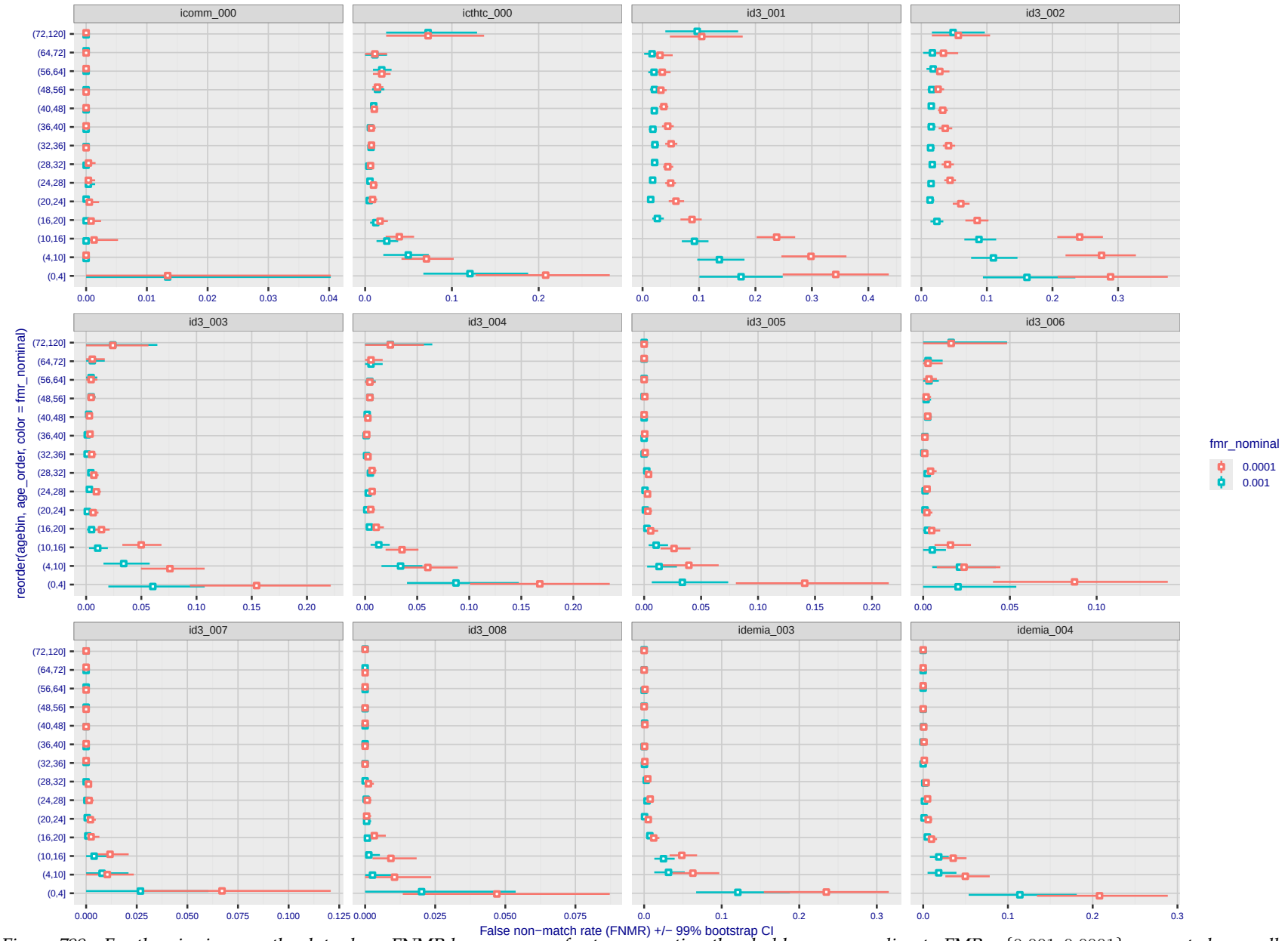


Figure 799: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

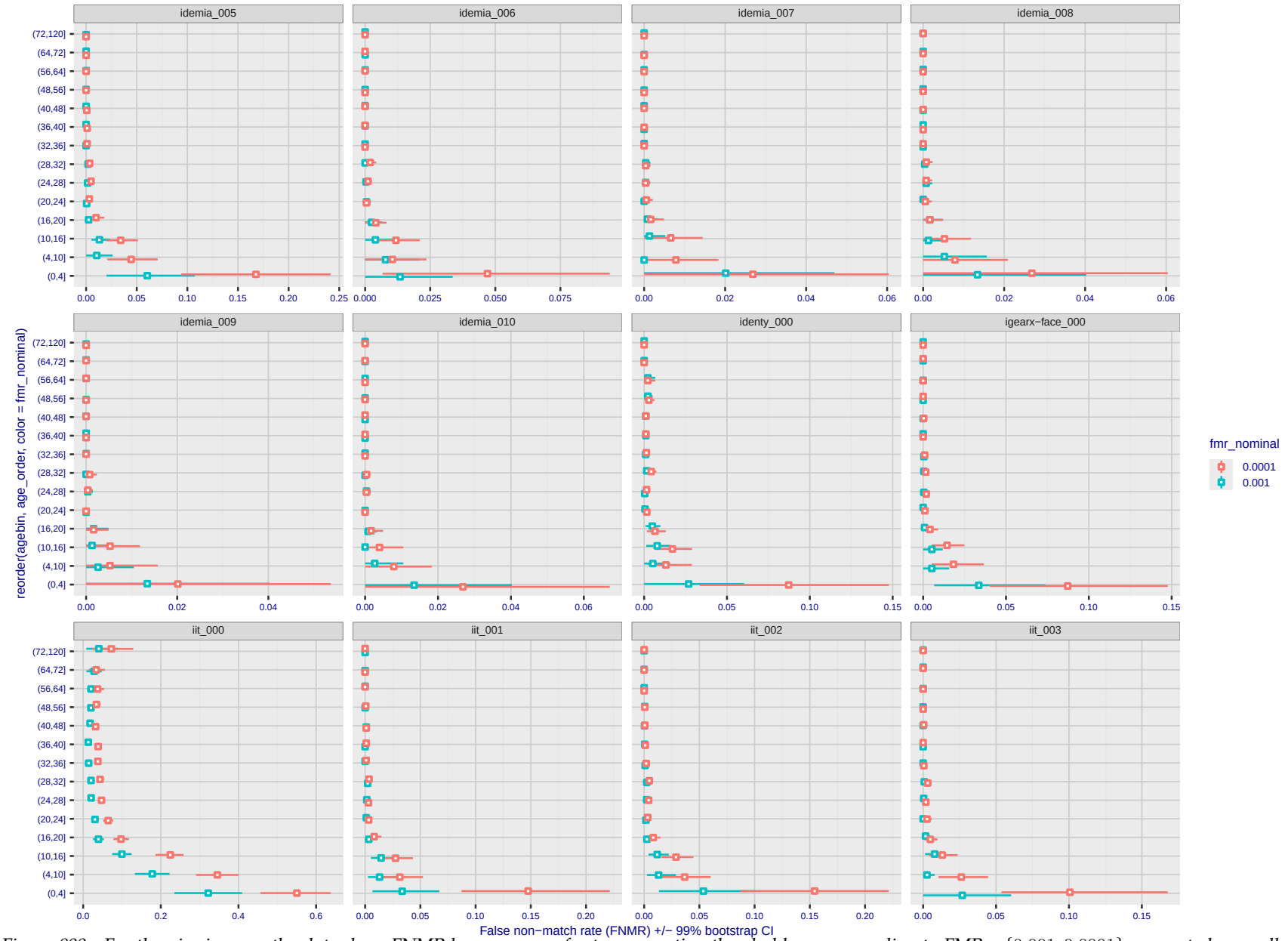


Figure 800: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 801: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 802: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 803: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

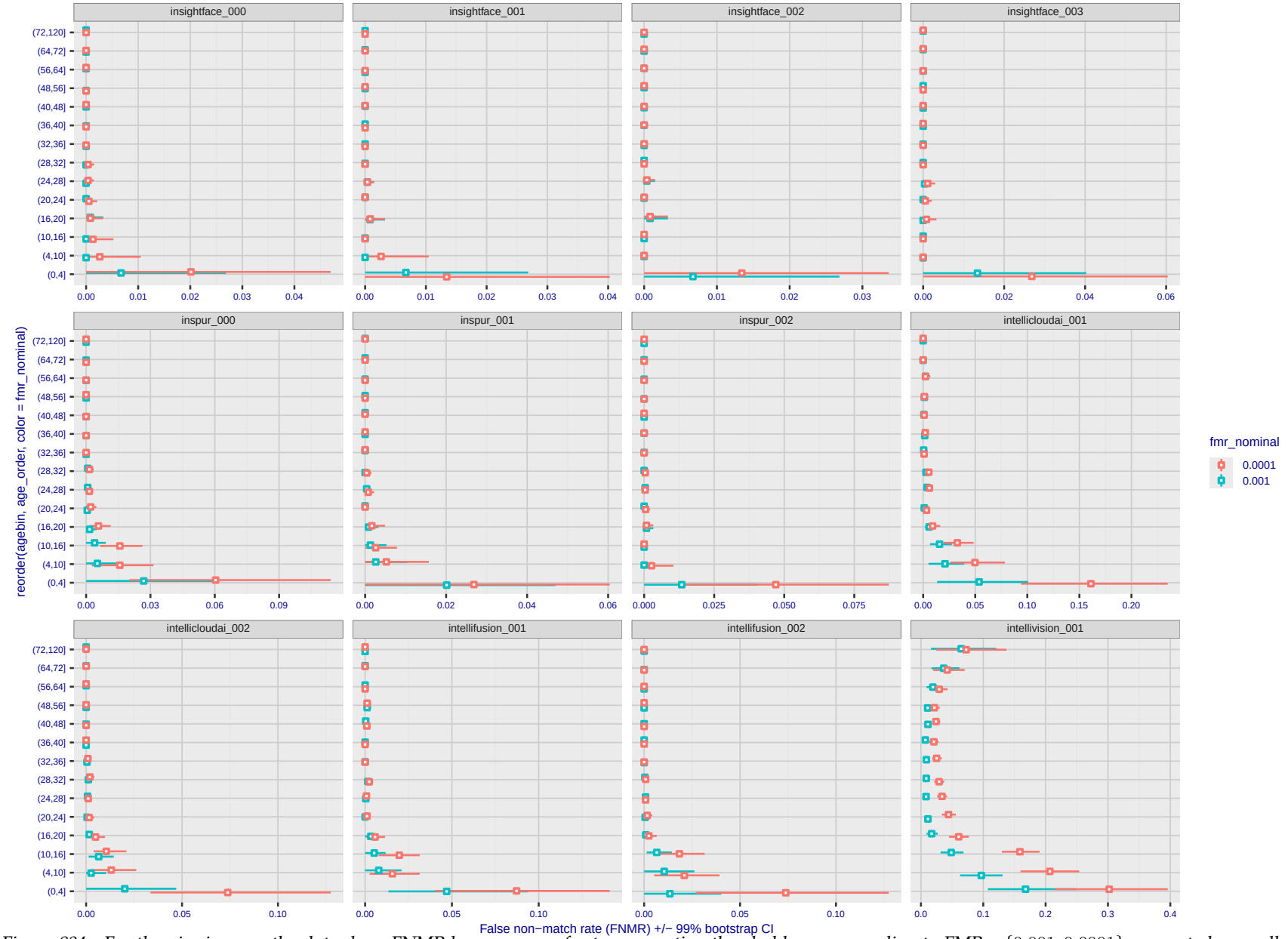


Figure 804: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

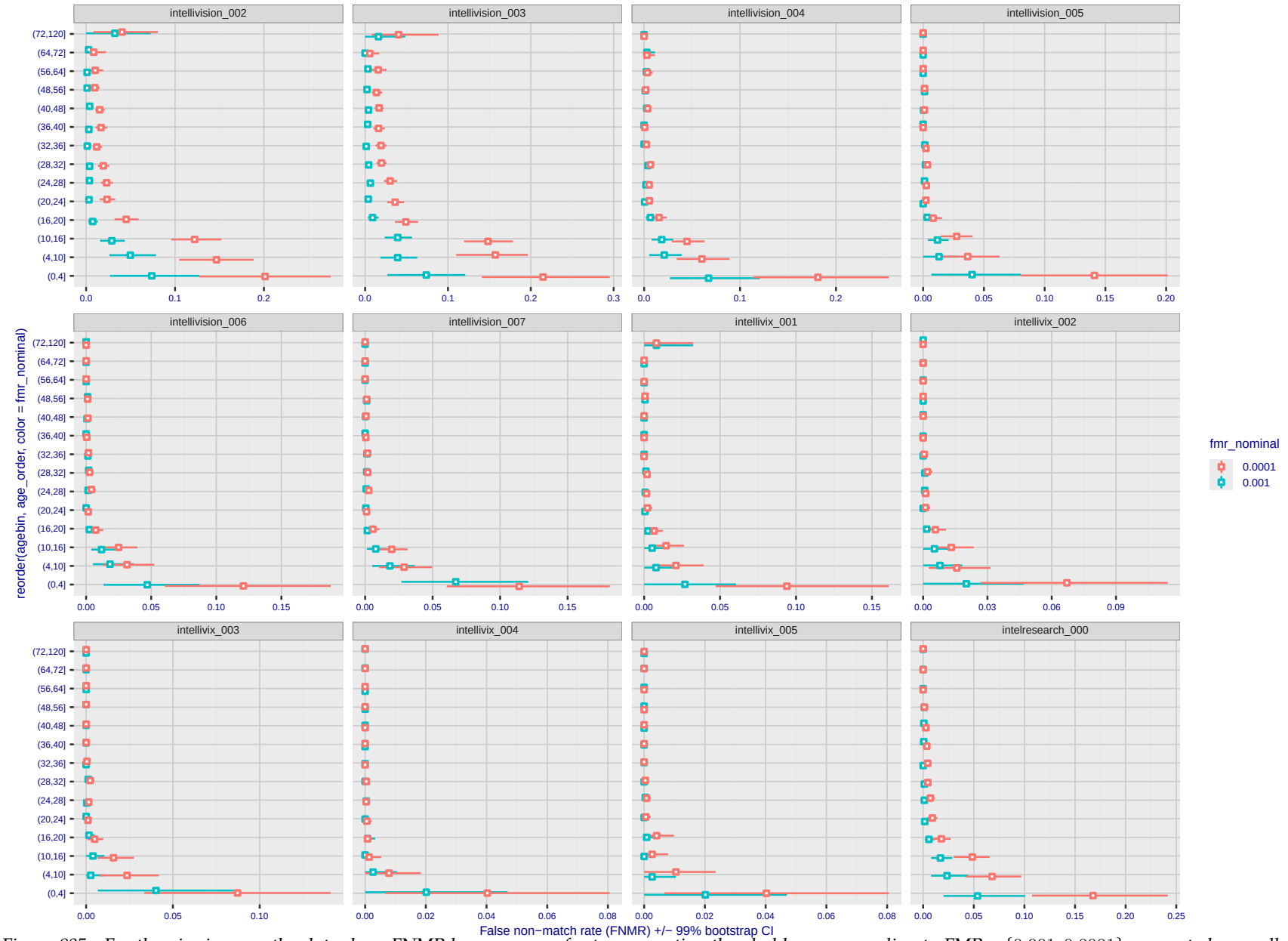


Figure 805: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

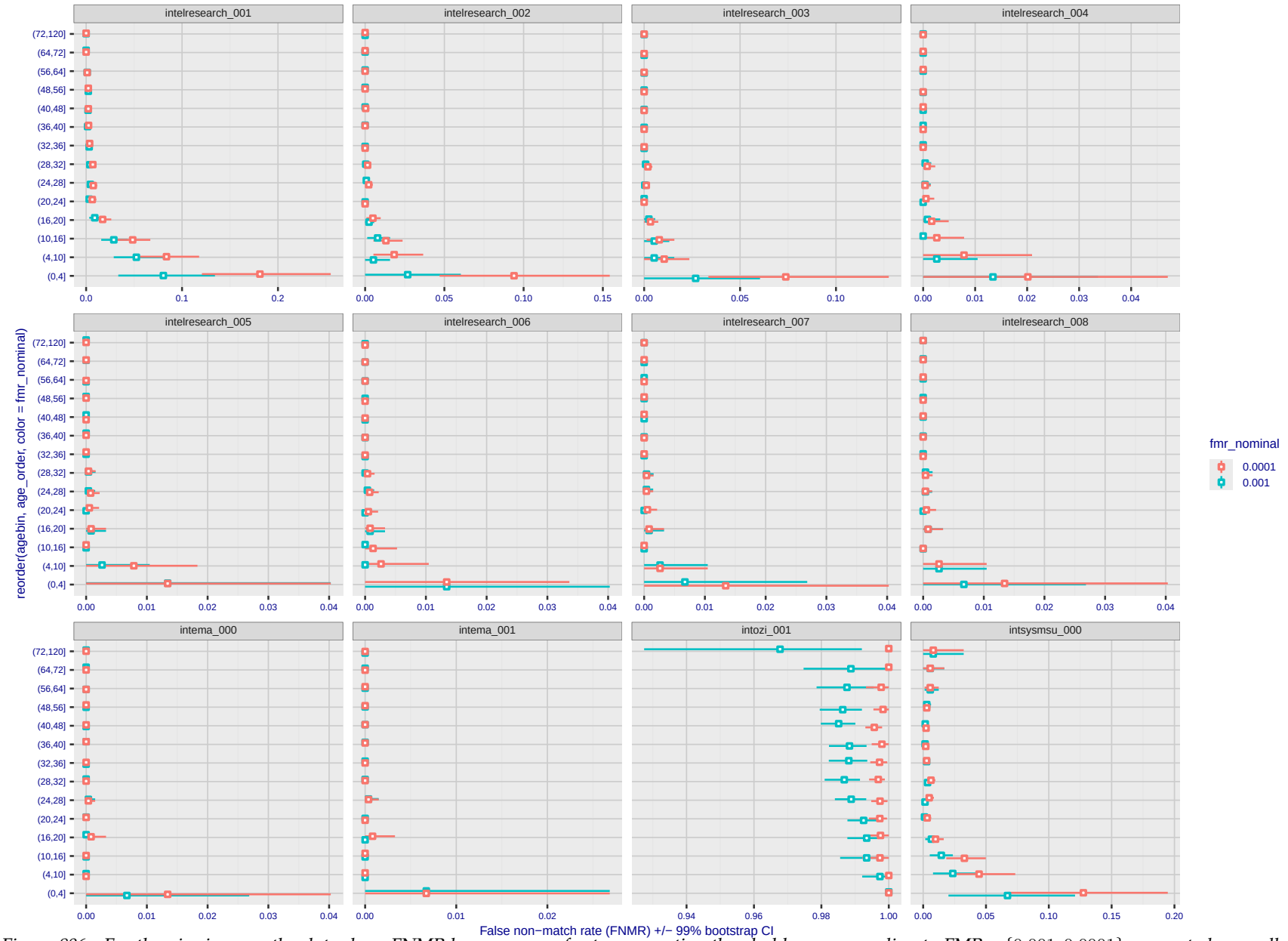


Figure 806: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 807: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 808: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 809: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

2026/01/23 11:36:01 FNMR(T) "False non-match rate" FMR(T) "False match rate"

Figure 810: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 811: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

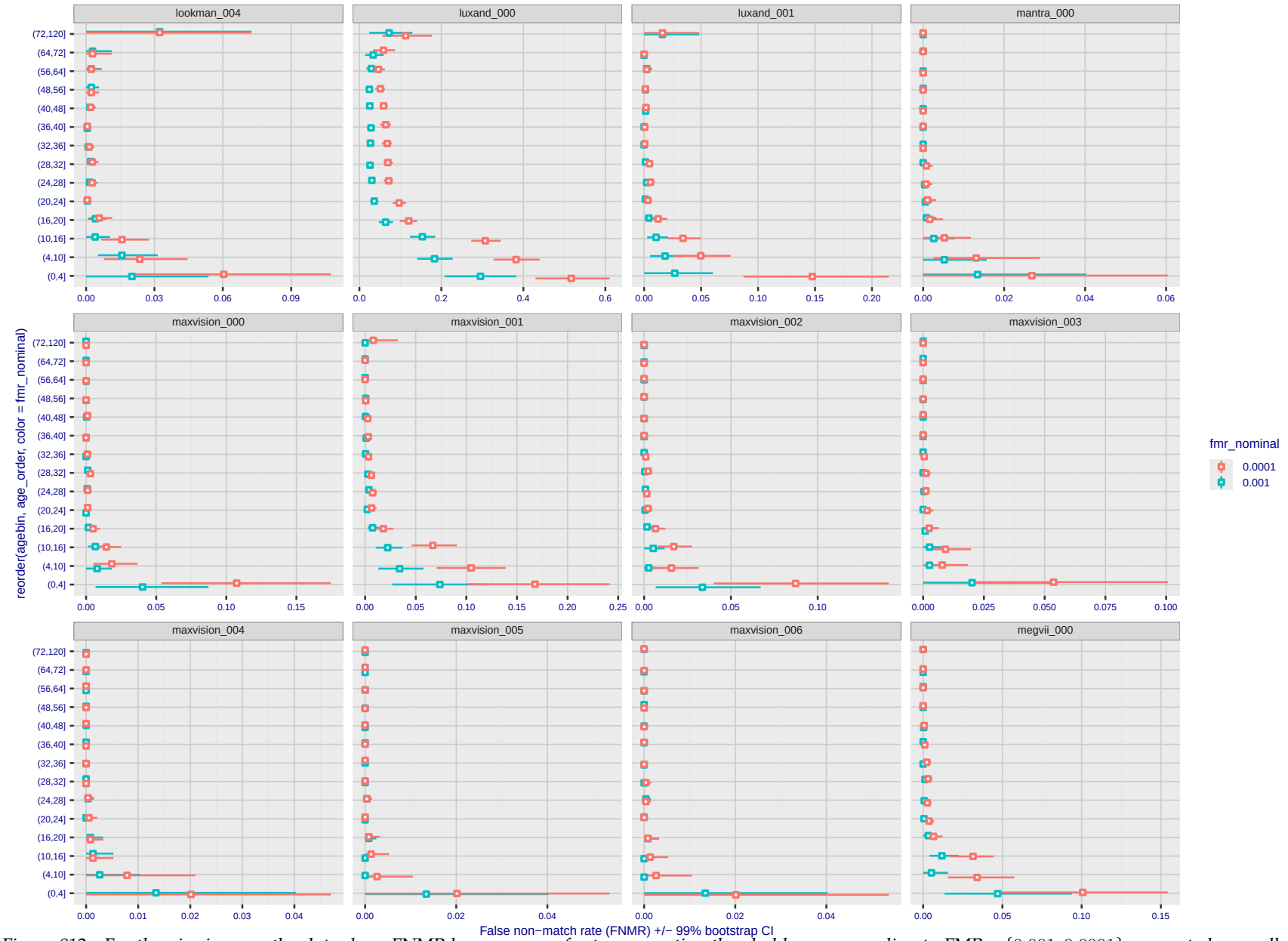


Figure 812: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

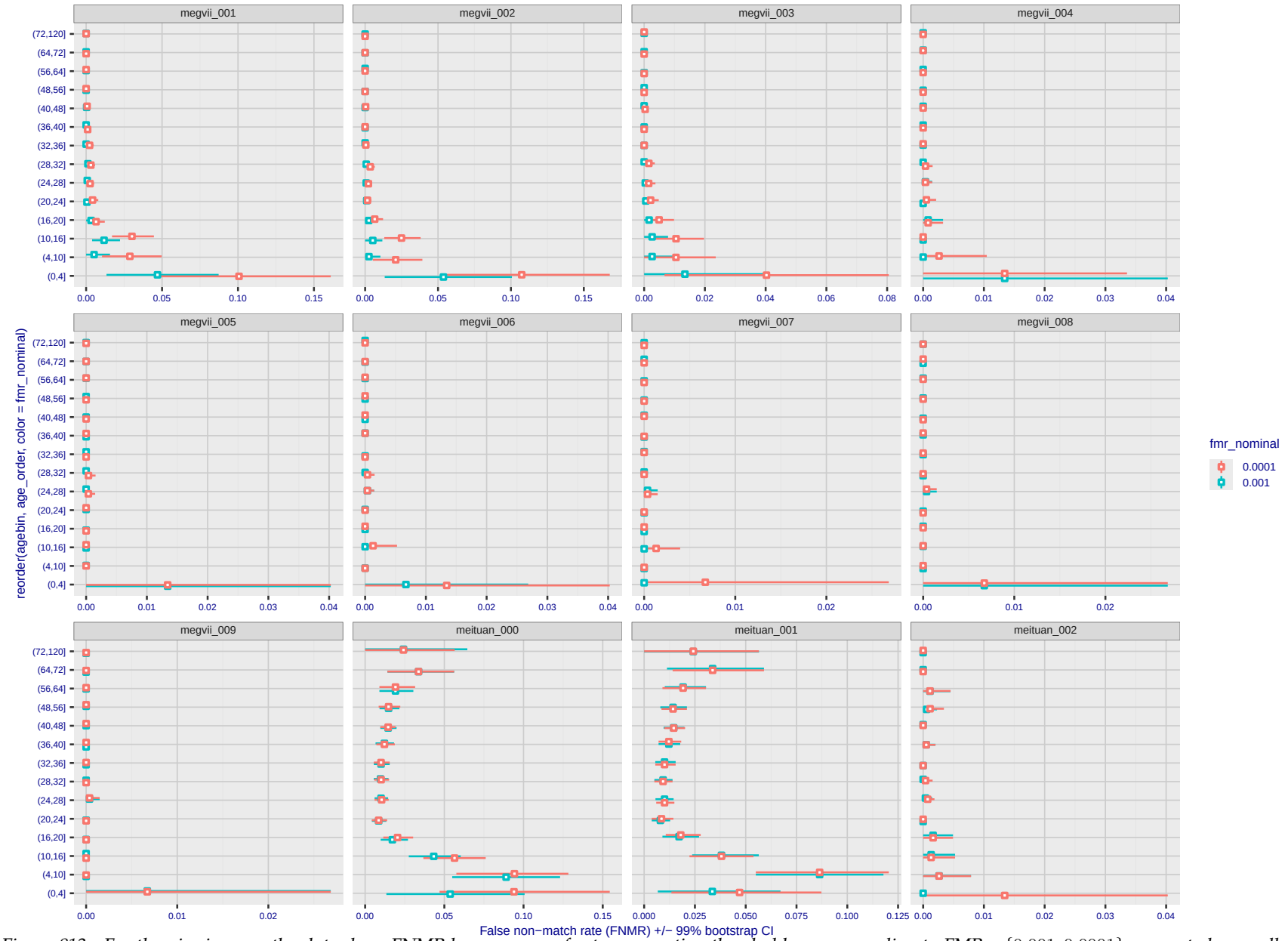


Figure 813: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 814: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

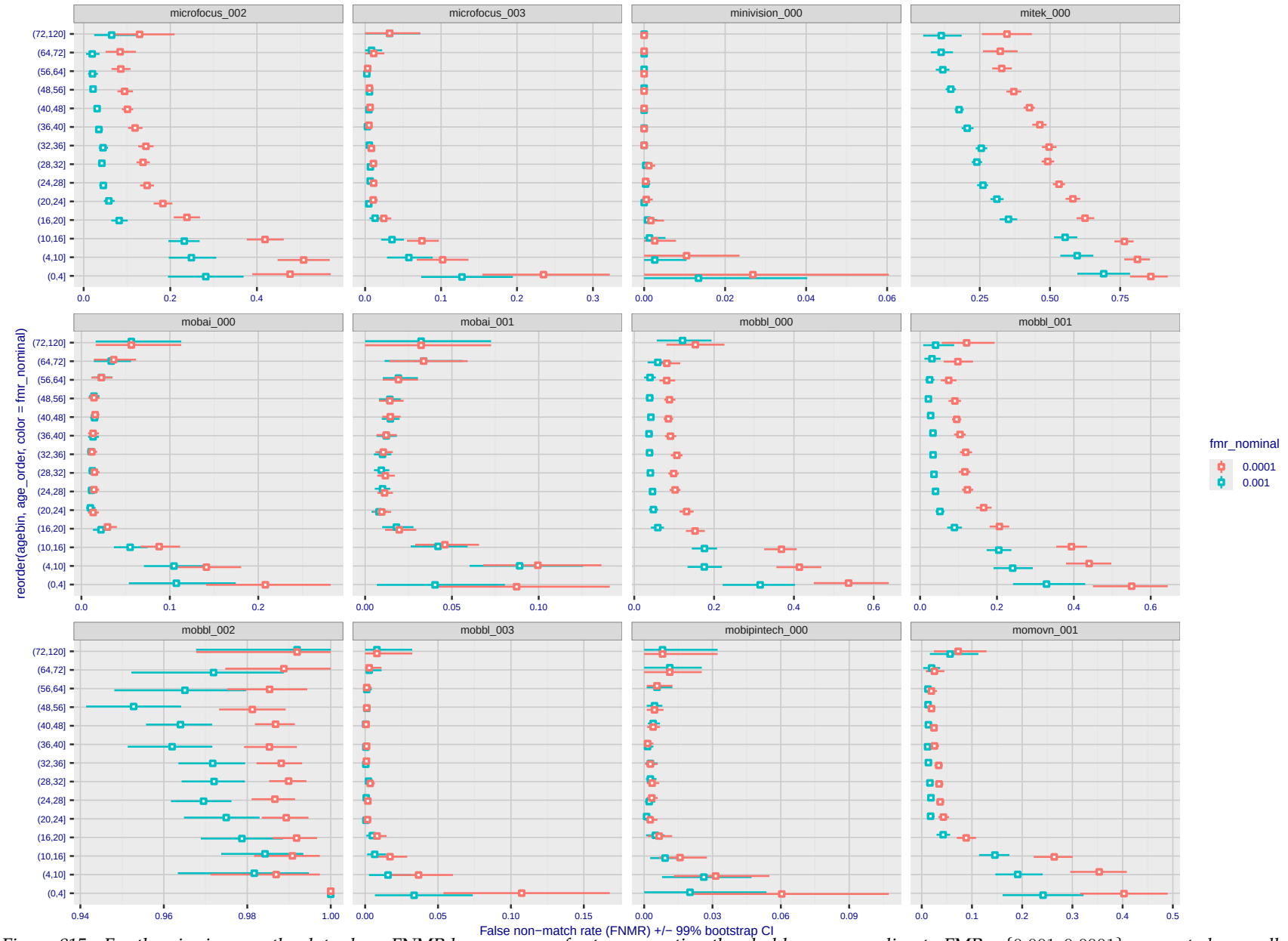


Figure 815: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 816: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

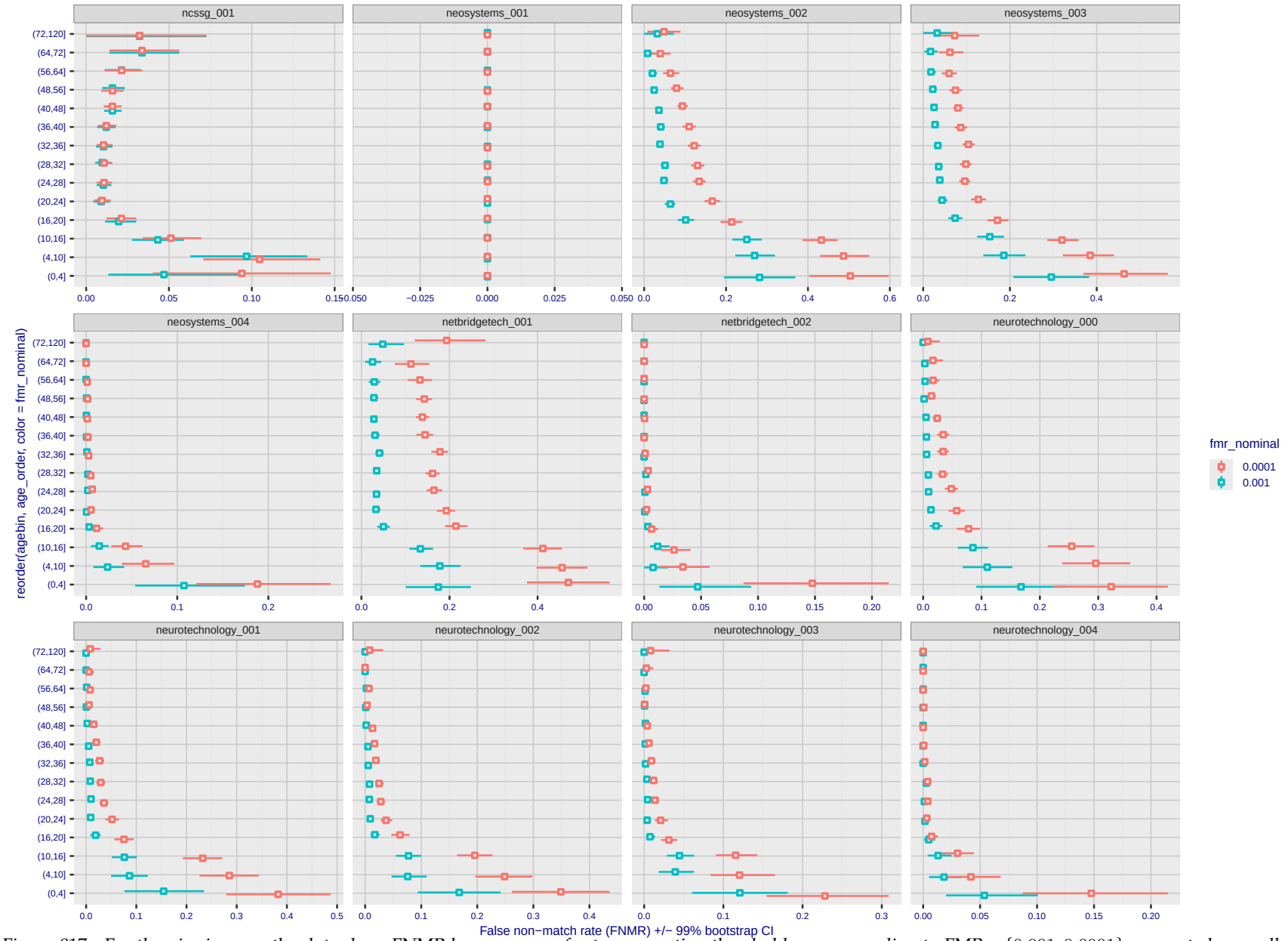


Figure 817: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

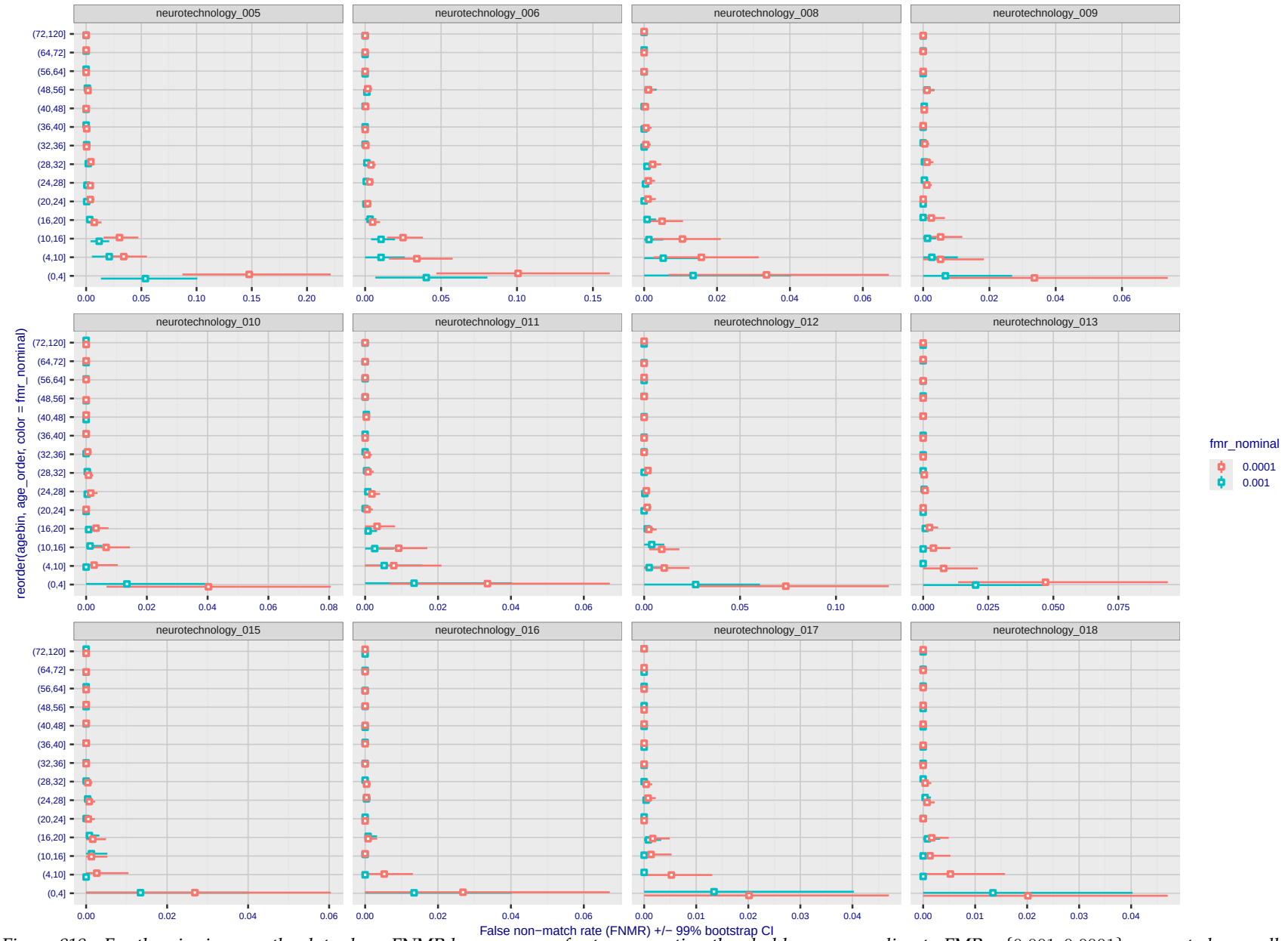


Figure 818: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 819: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 820: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 821: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 822: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

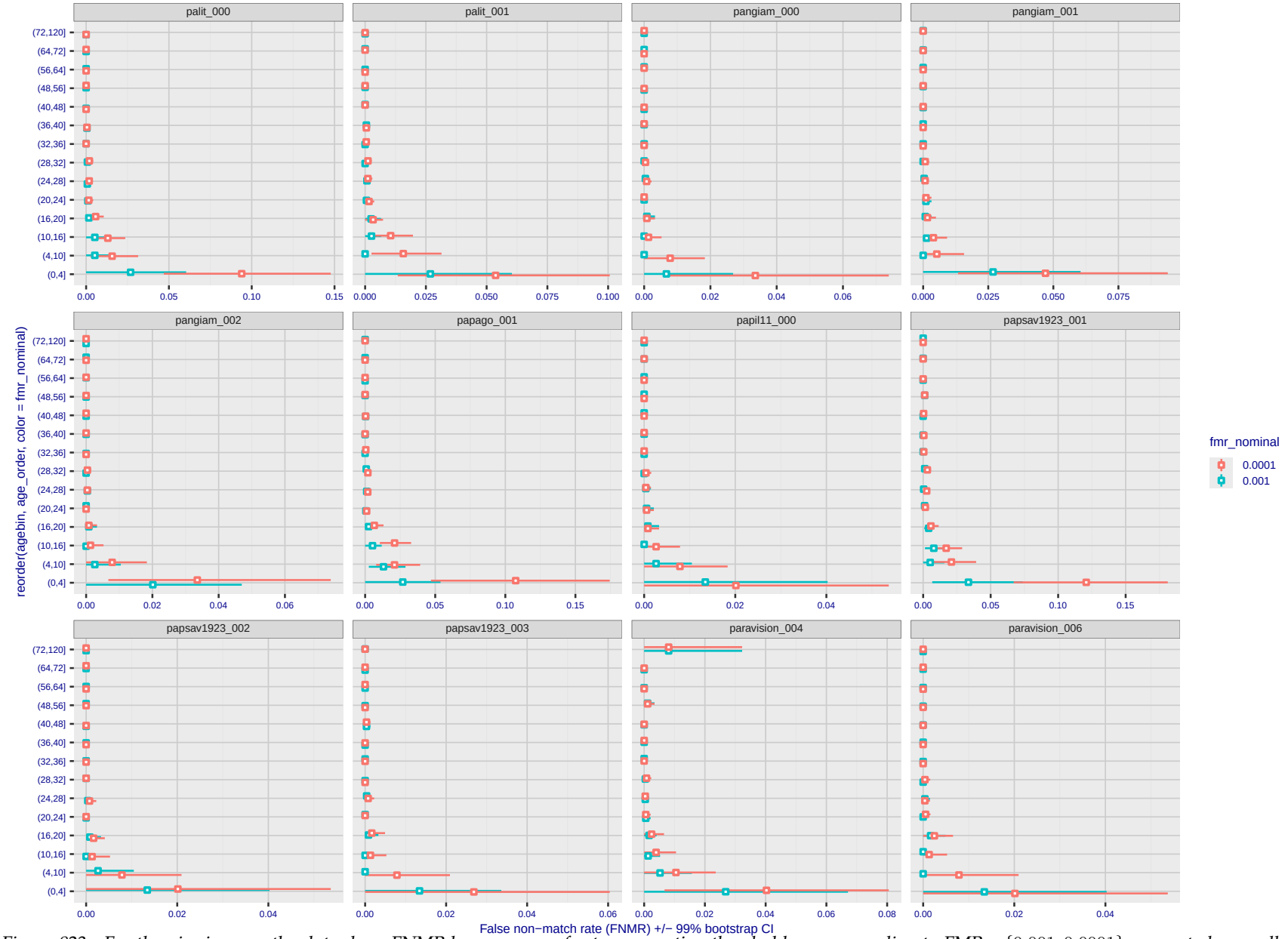


Figure 823: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

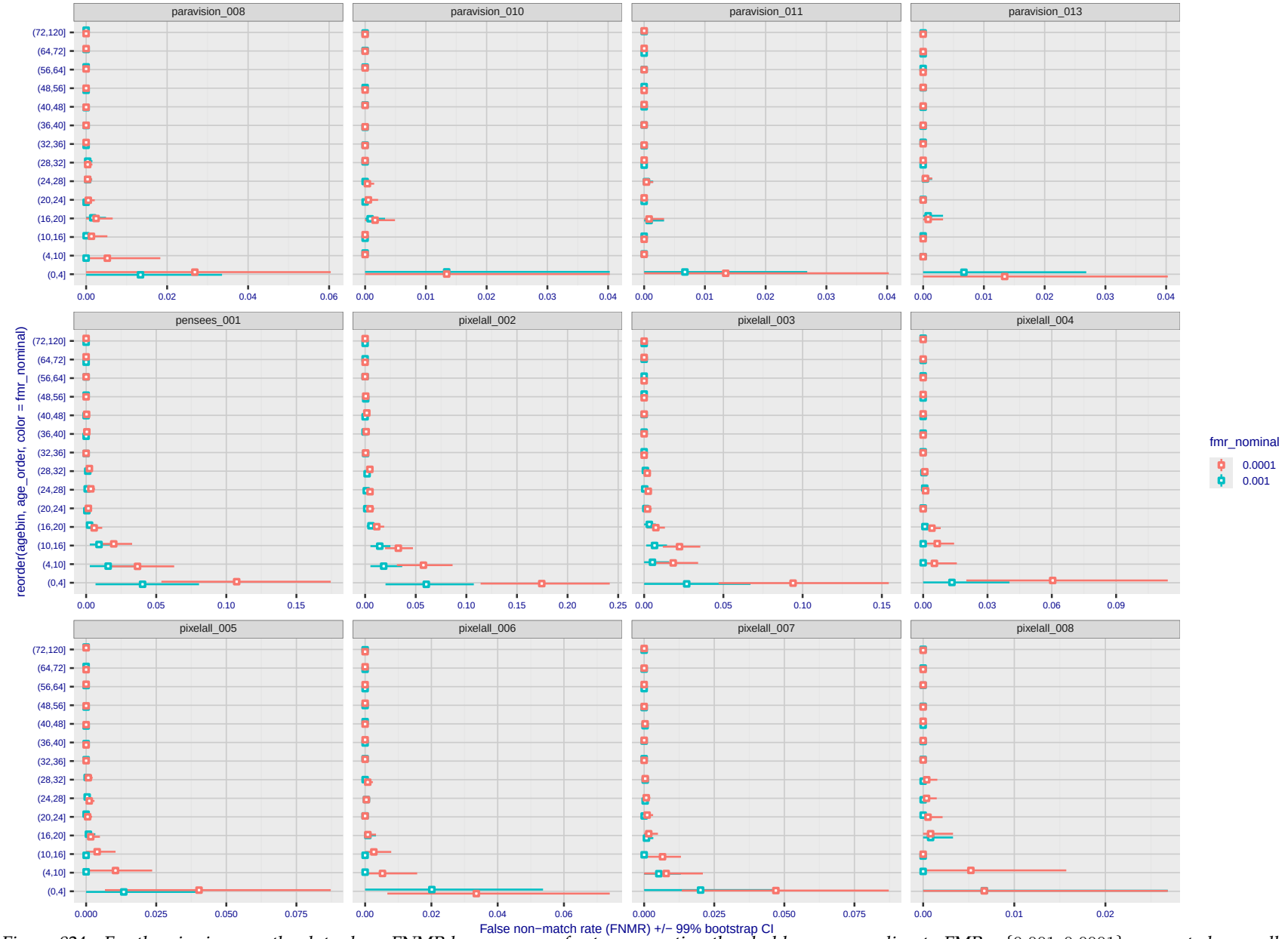


Figure 824: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 825: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

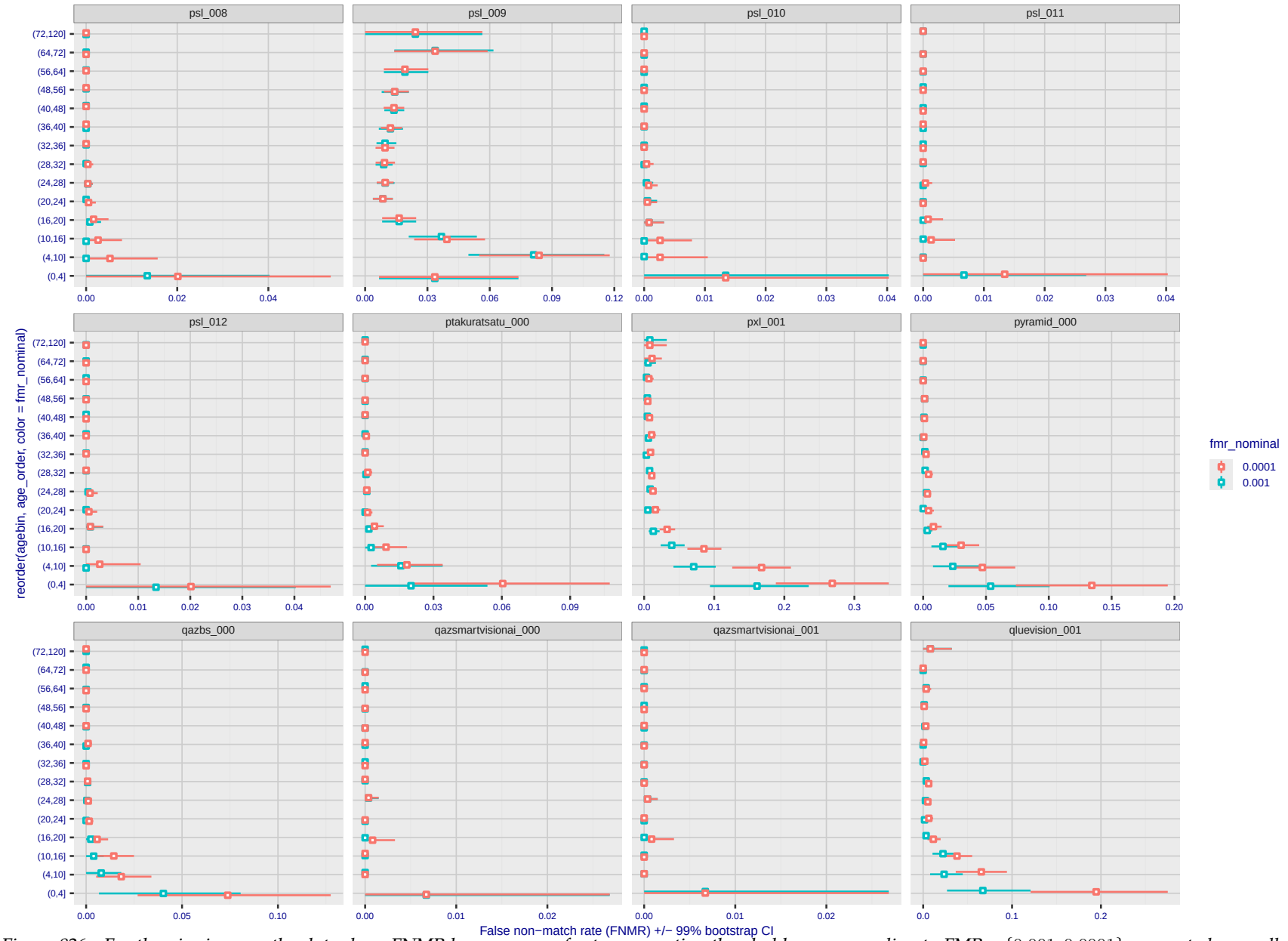


Figure 826: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 827: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

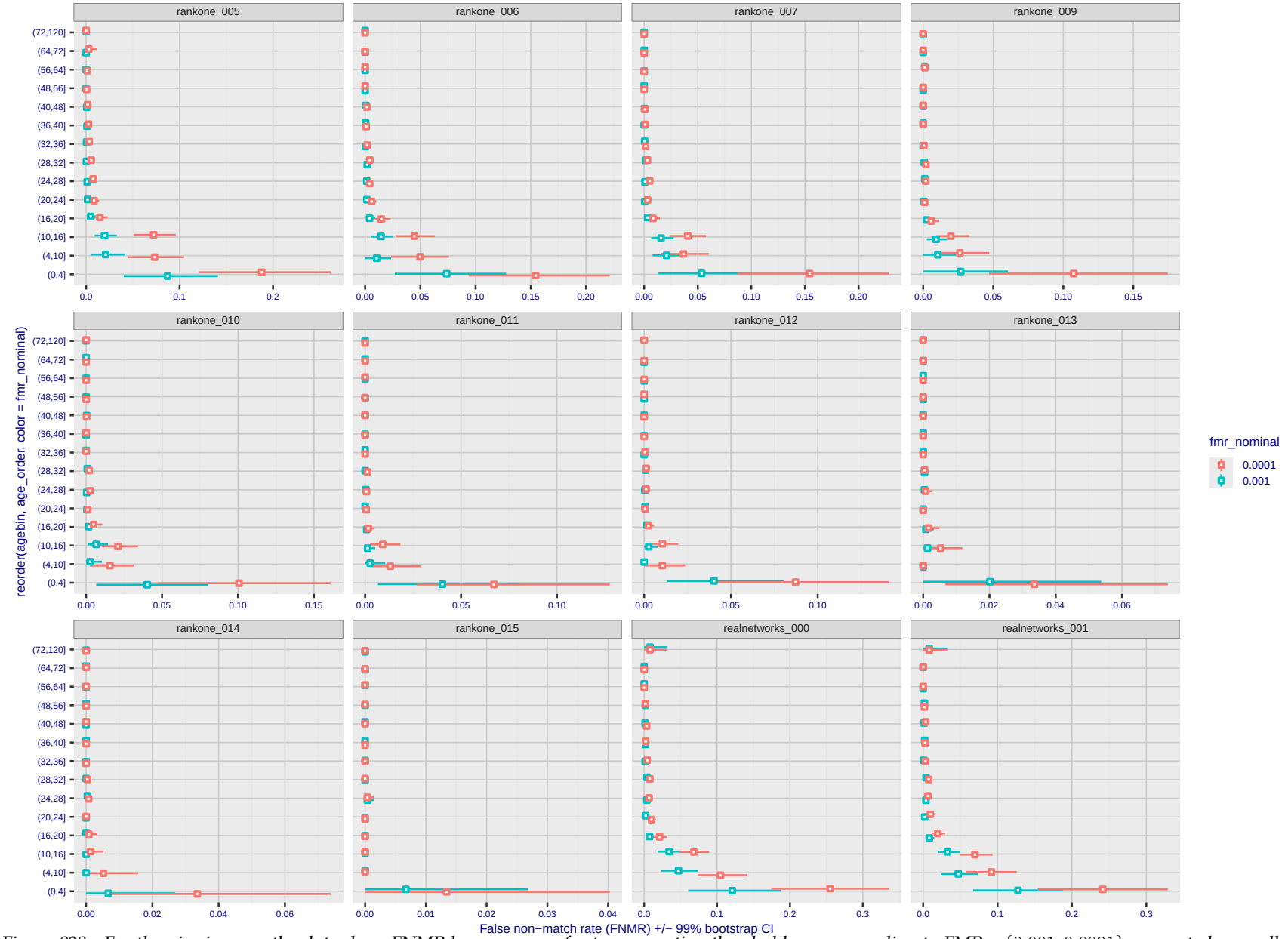


Figure 828: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

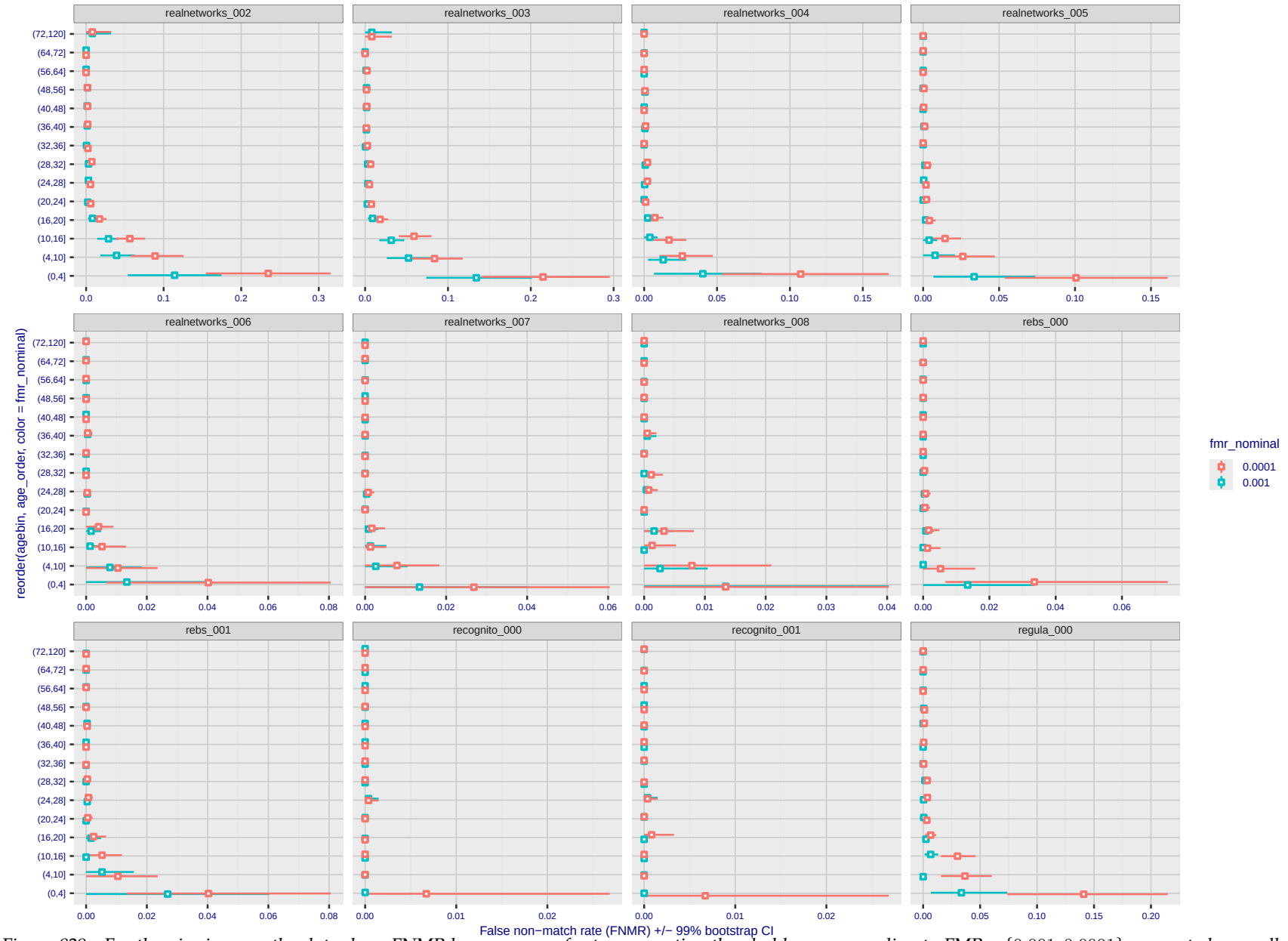


Figure 829: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 830: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

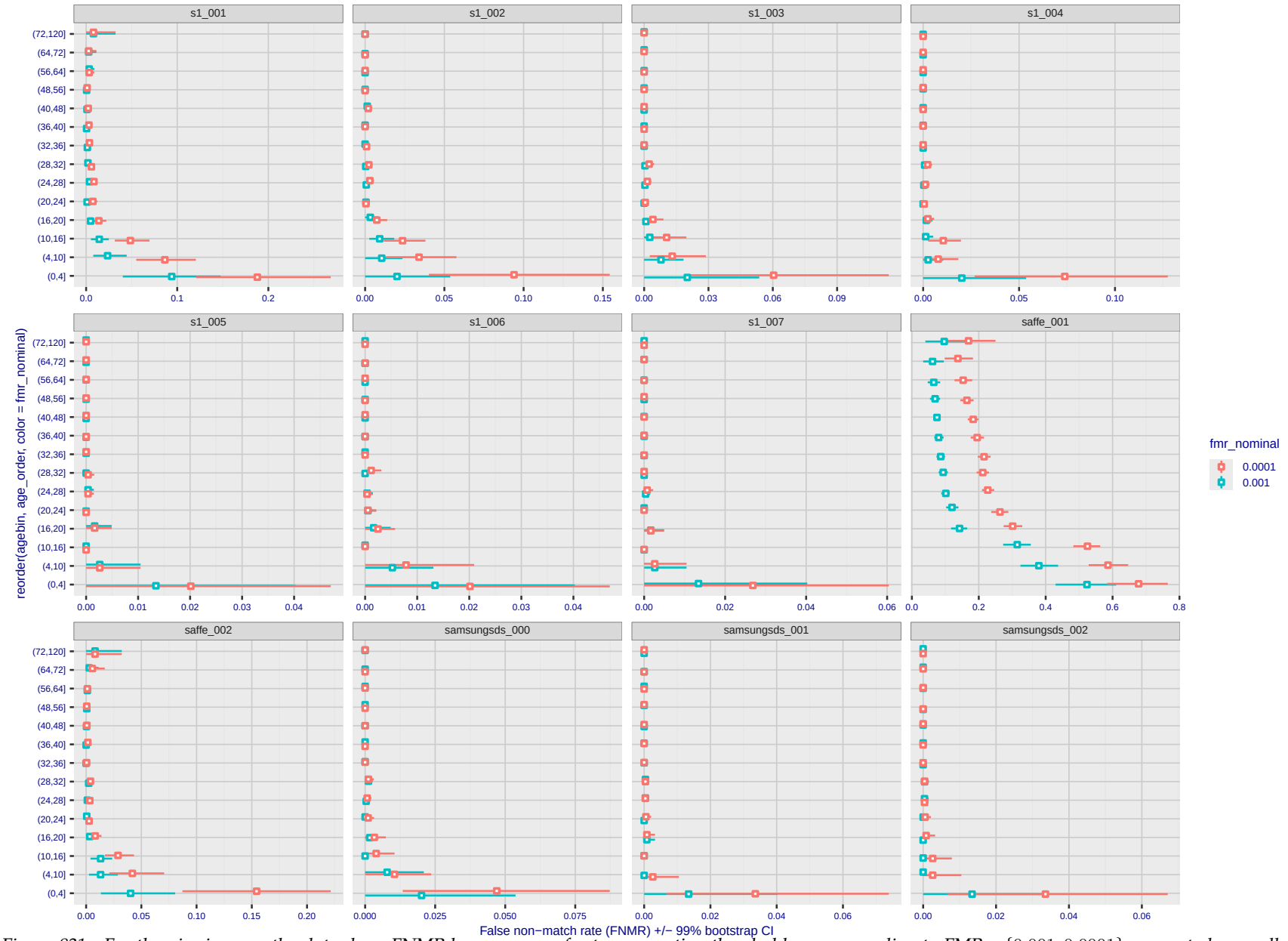


Figure 831: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

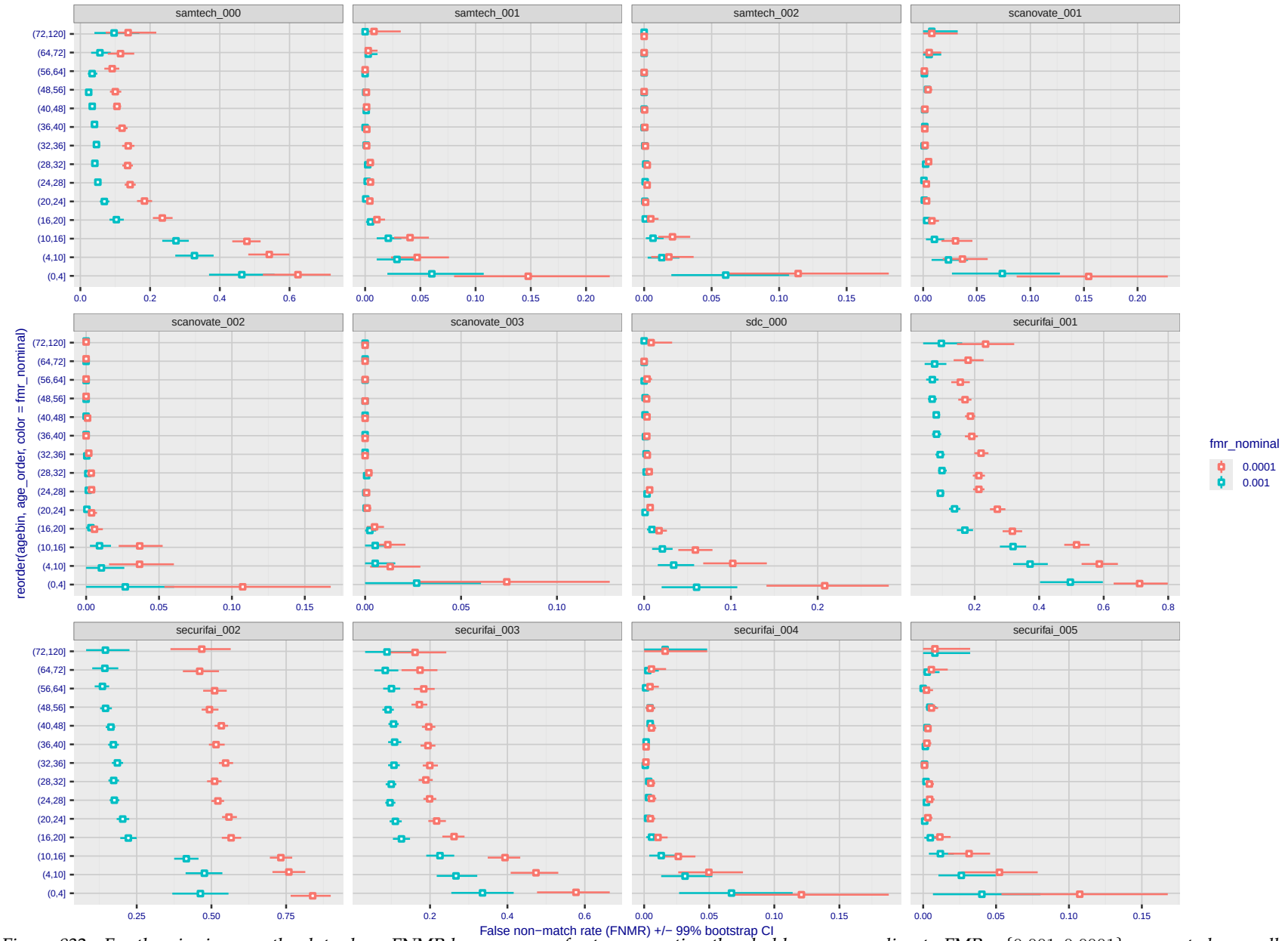


Figure 832: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

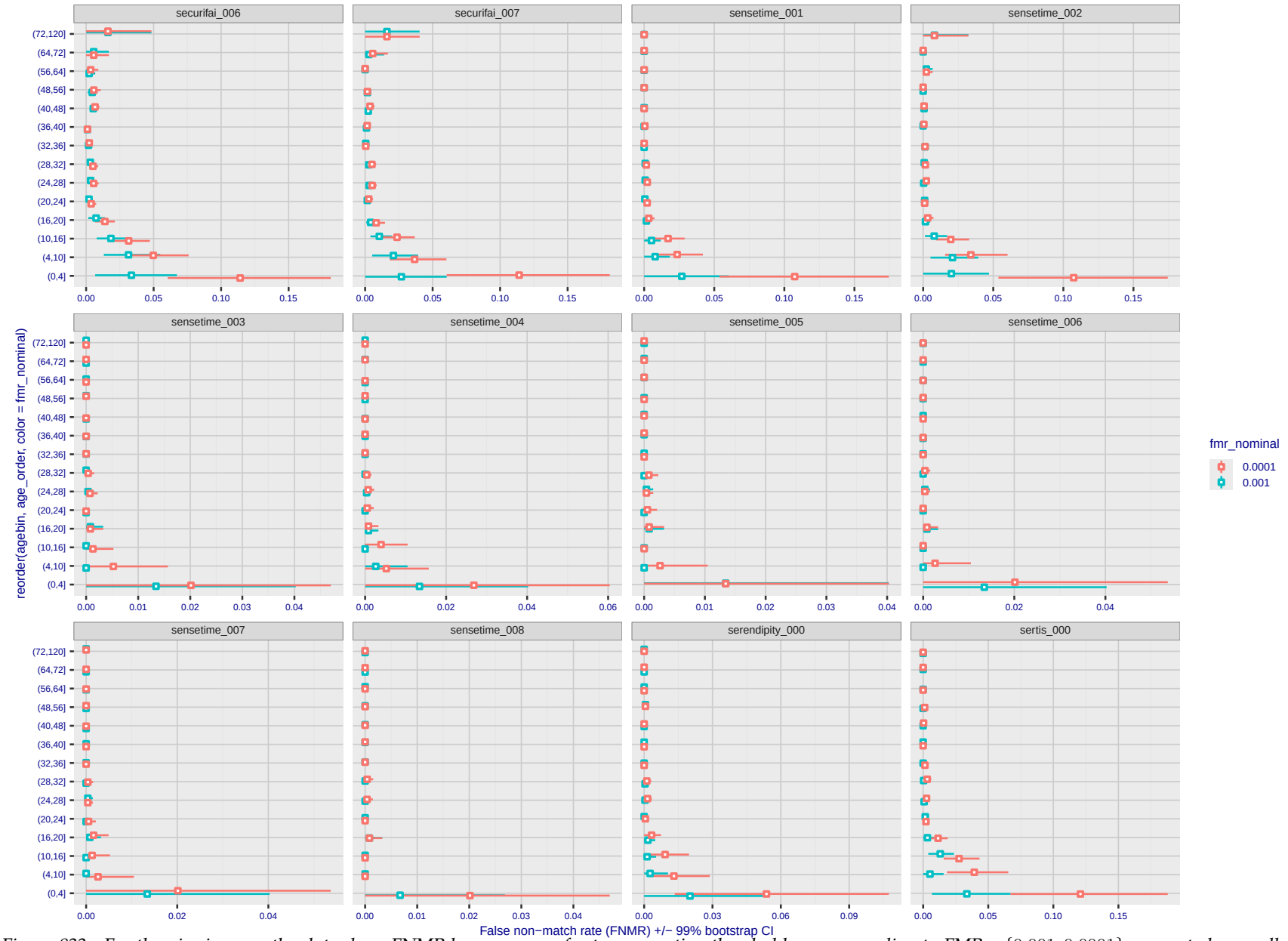


Figure 833: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

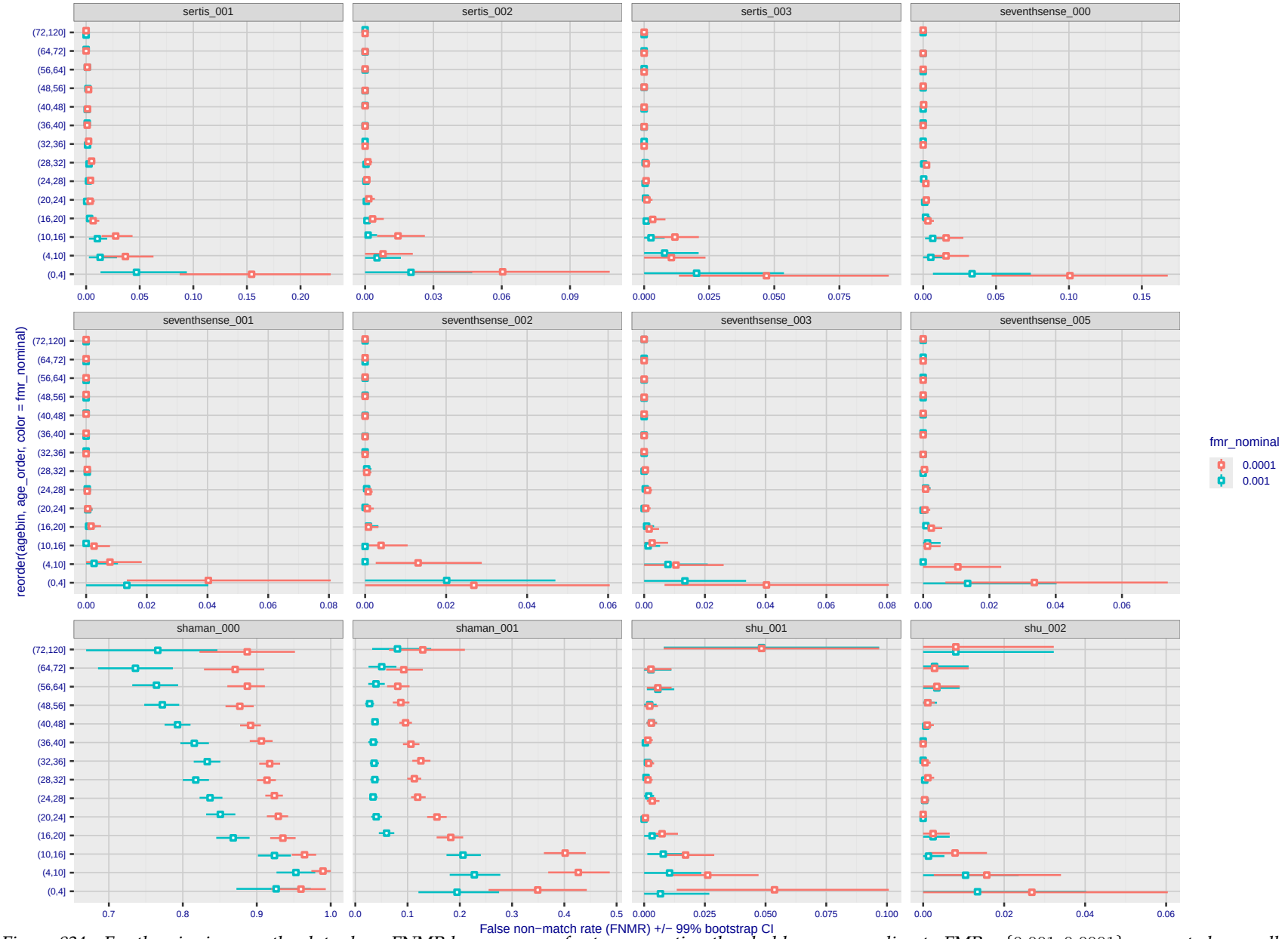


Figure 834: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 835: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 836: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

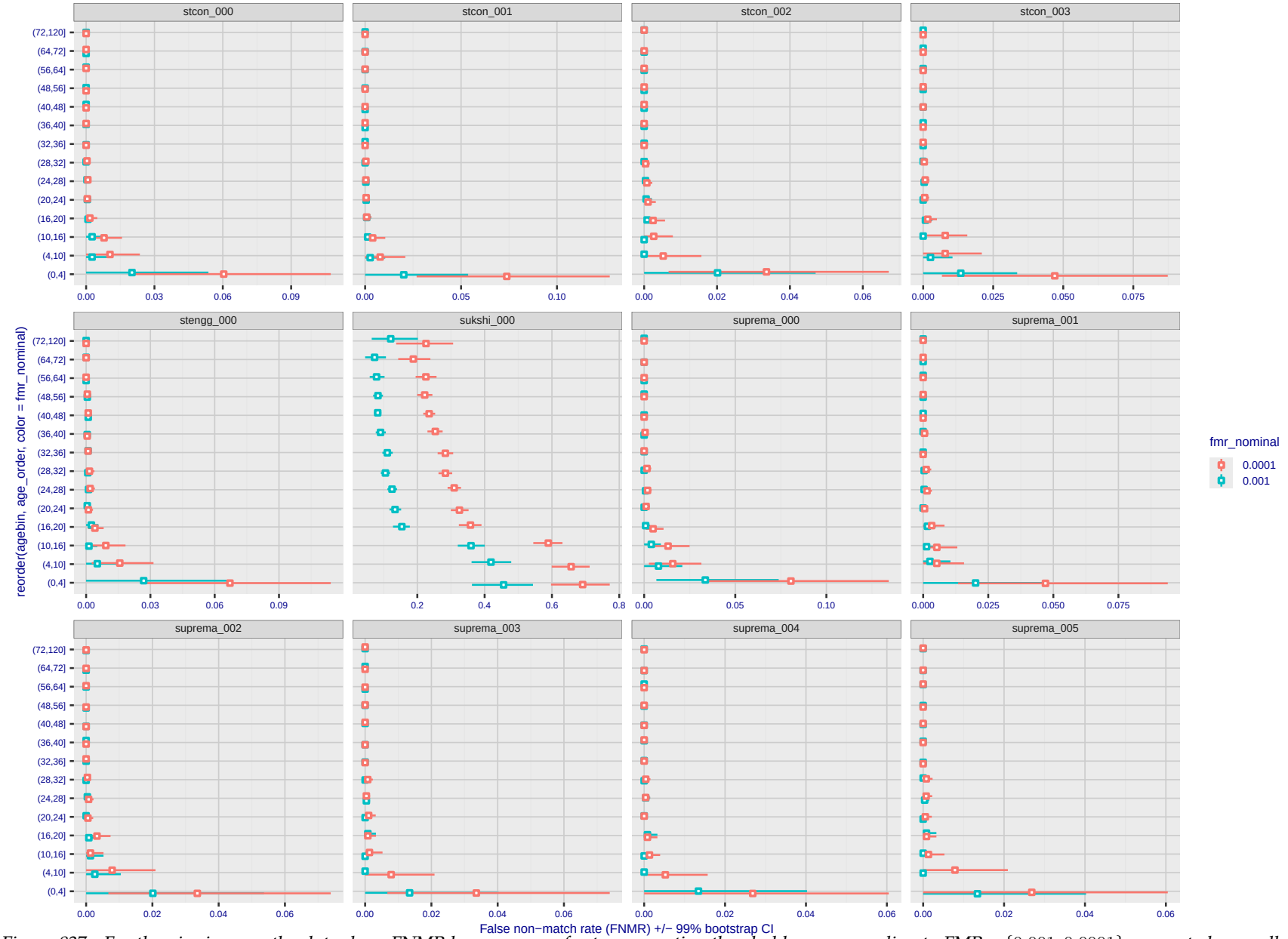


Figure 837: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

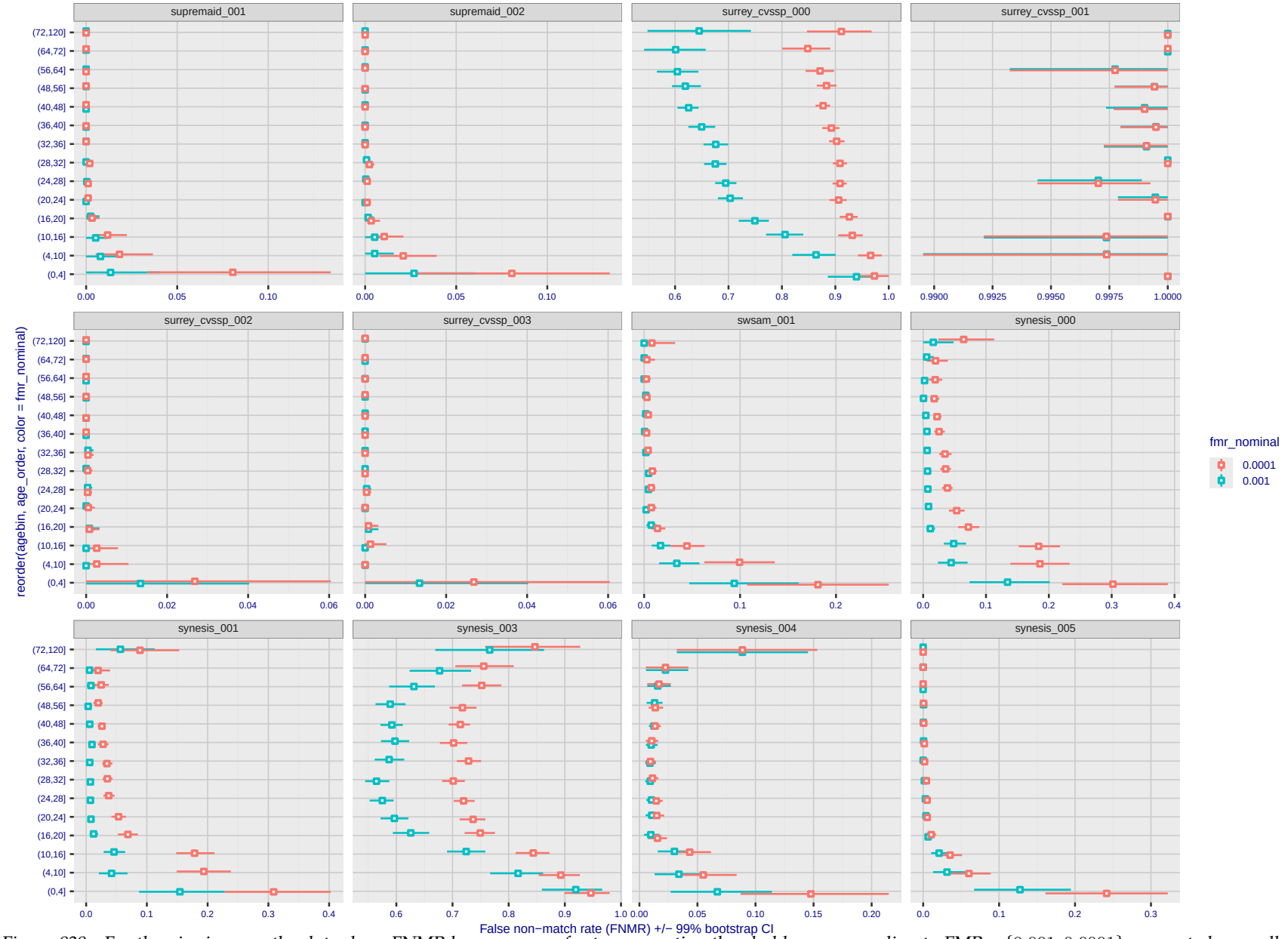


Figure 838: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 839: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 840: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 841: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

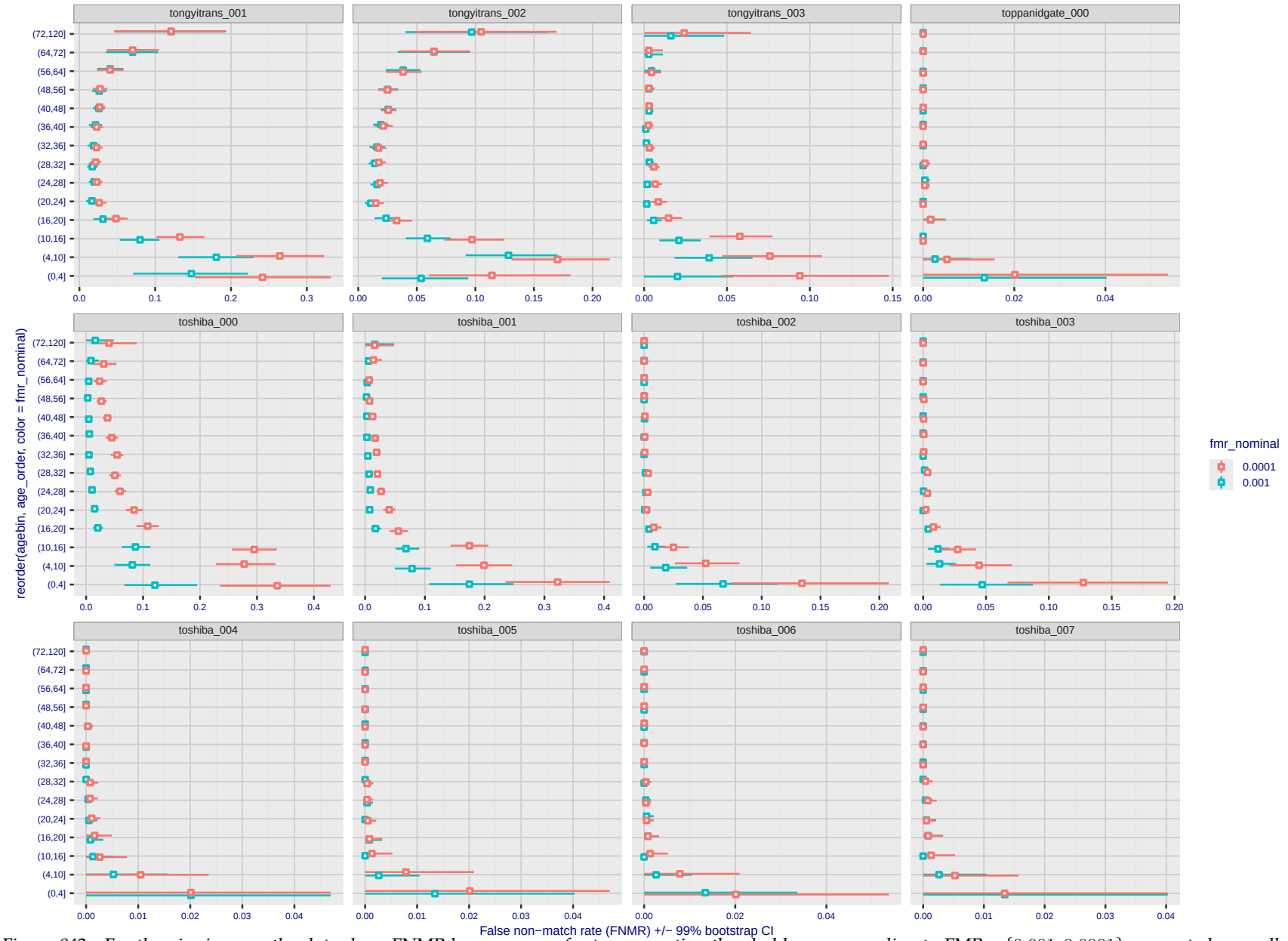


Figure 842: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

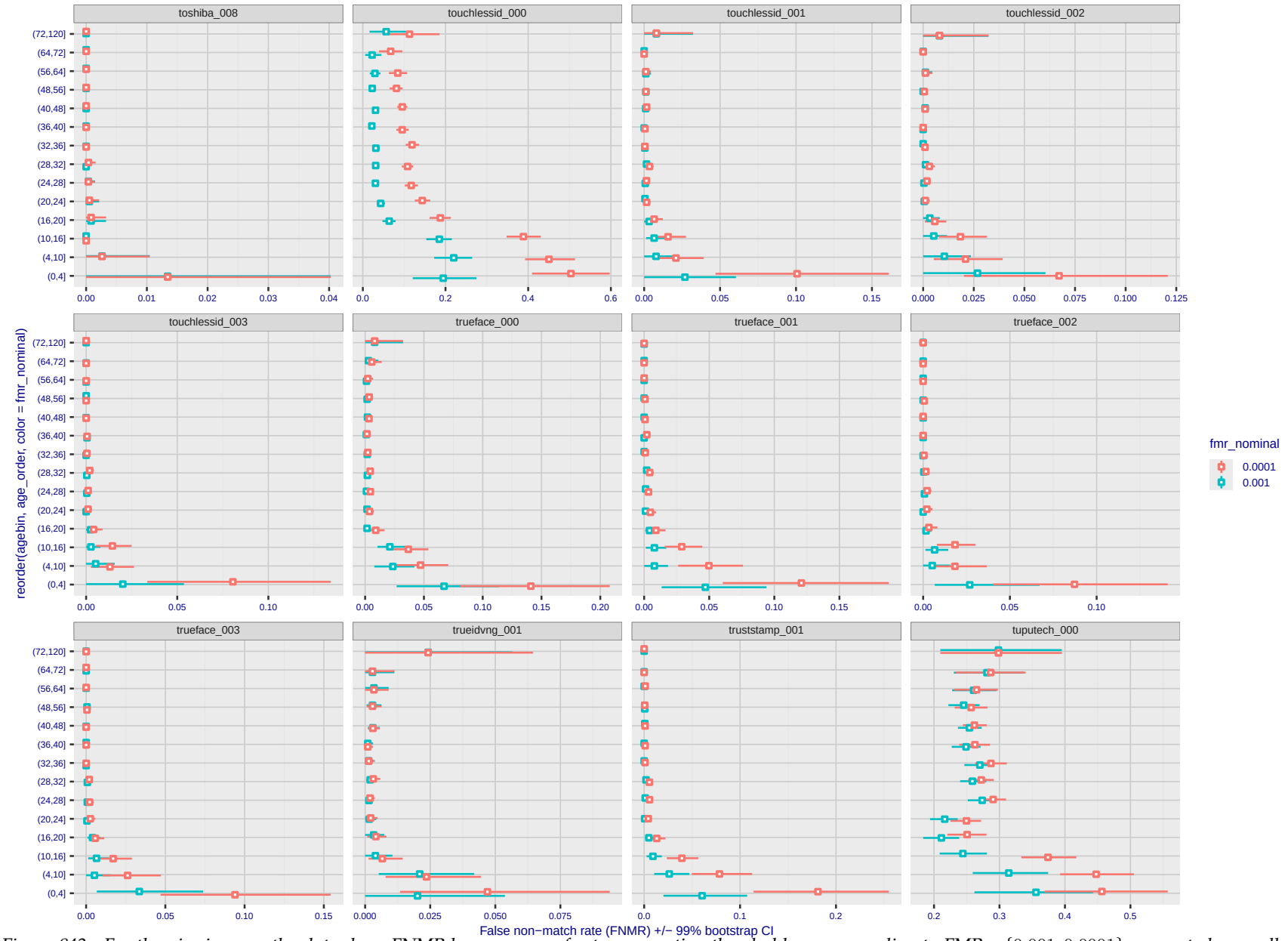


Figure 843: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 844: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 845: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

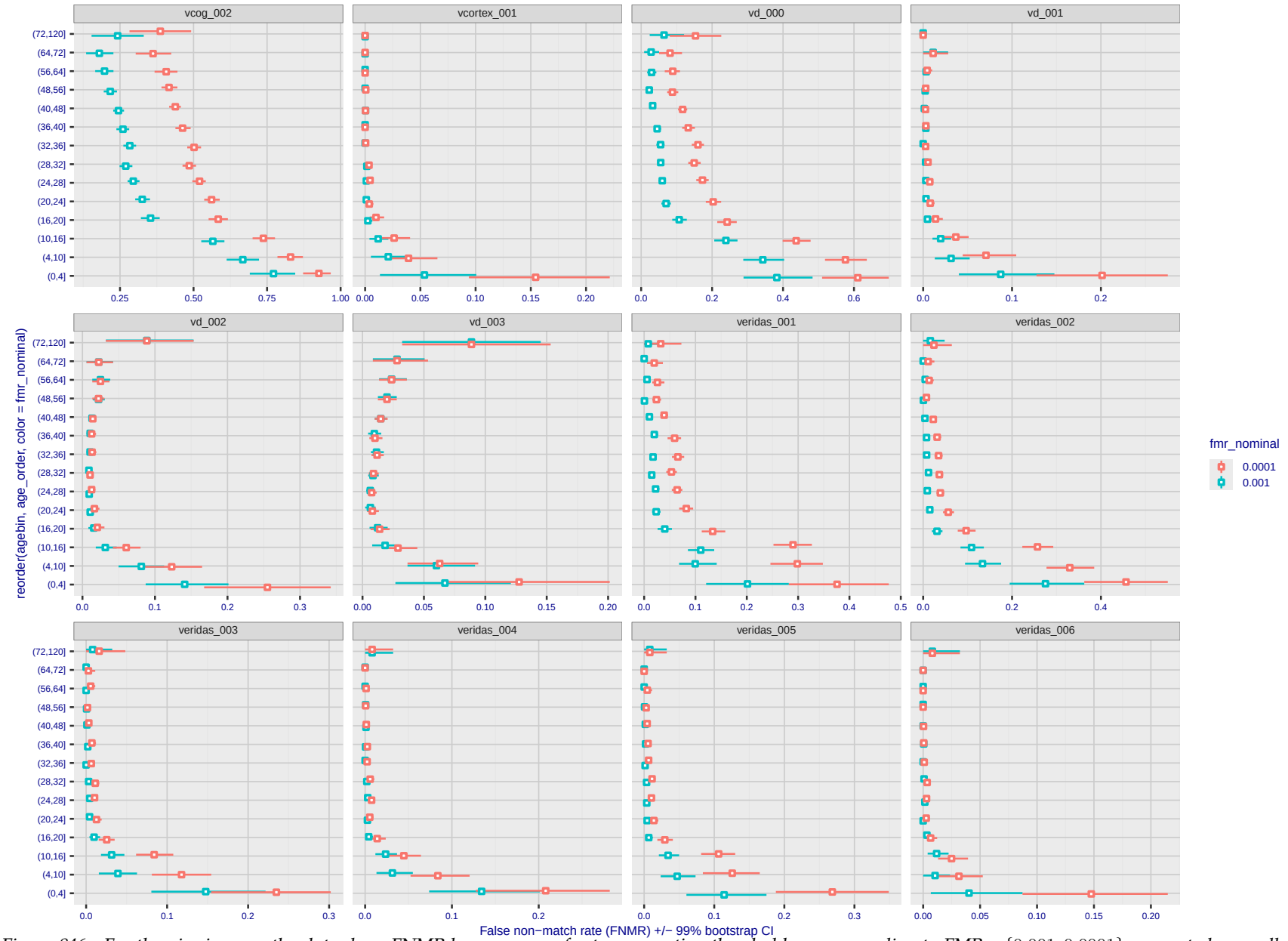


Figure 846: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 847: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

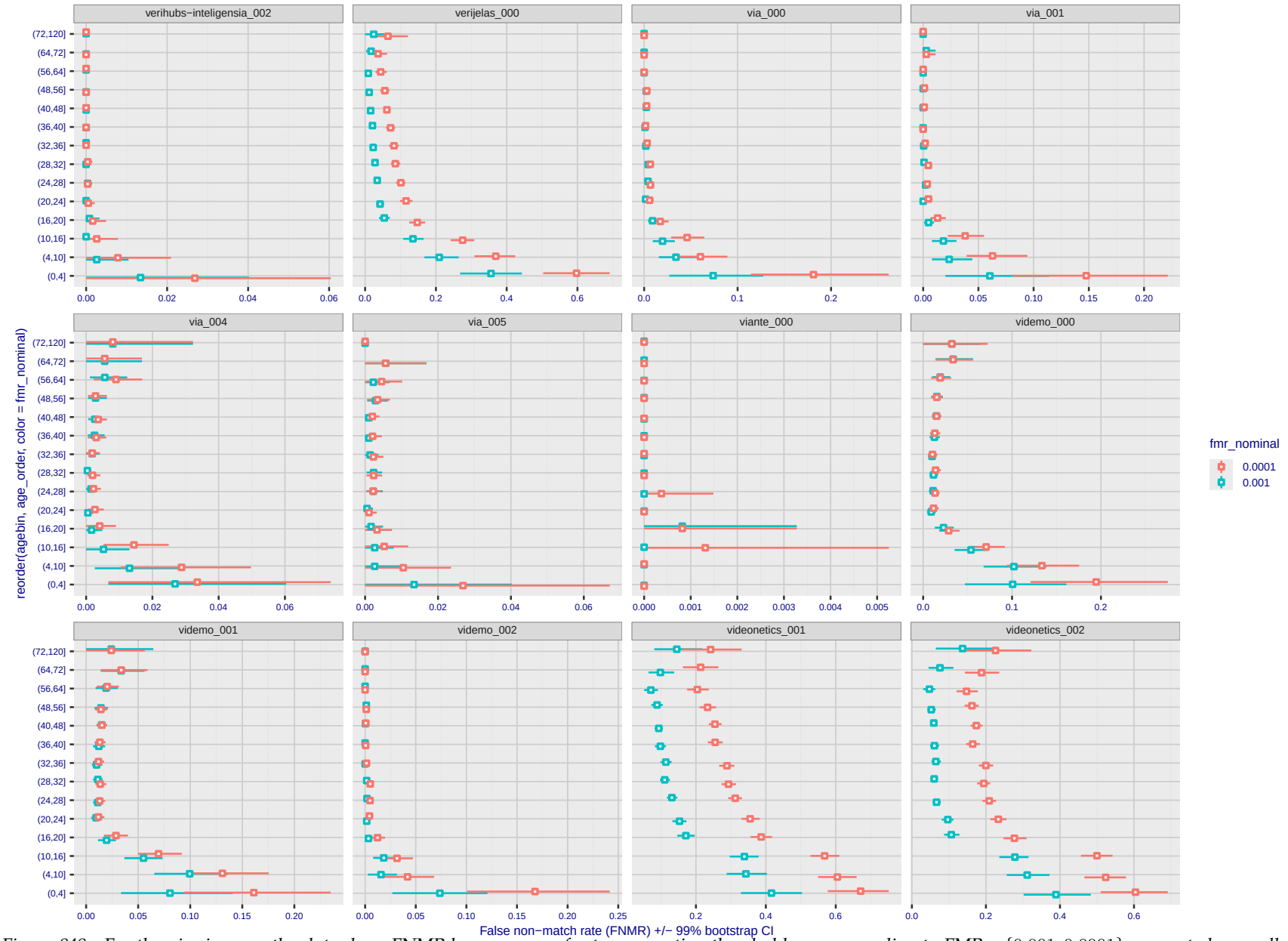


Figure 848: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

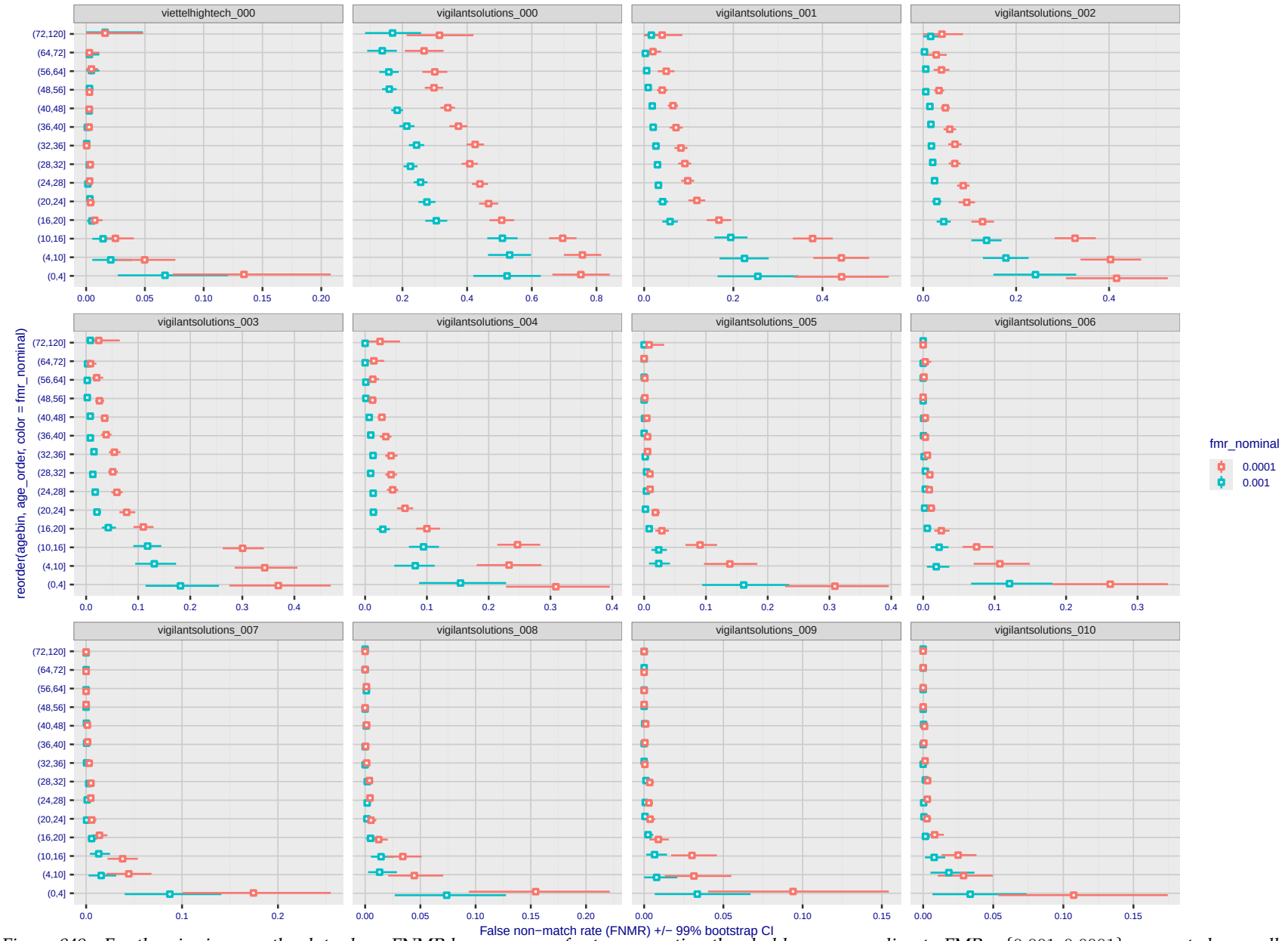


Figure 849: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 850: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

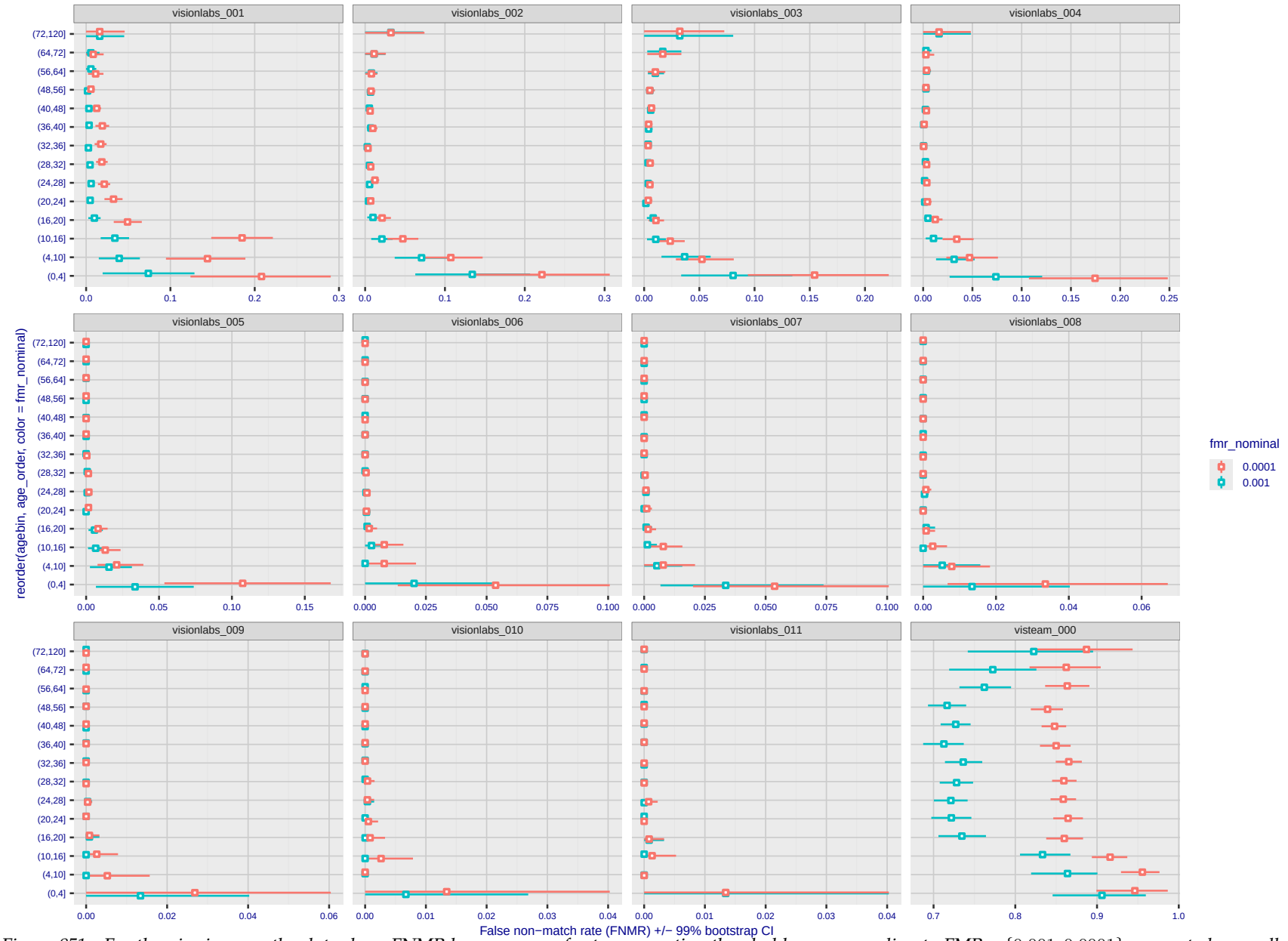


Figure 851: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Figure 852: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 853: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 854: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

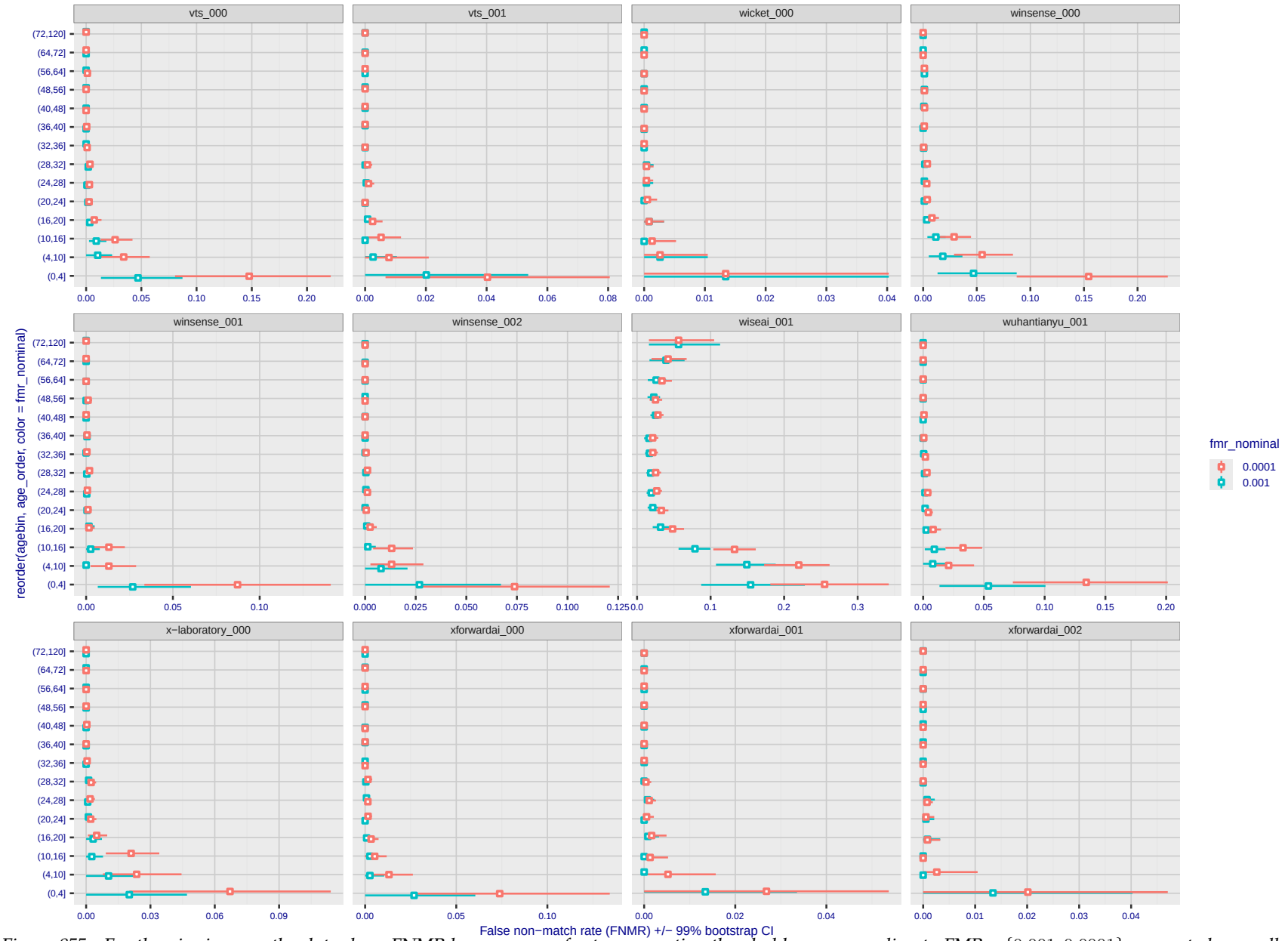


Figure 855: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

Figure 856: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

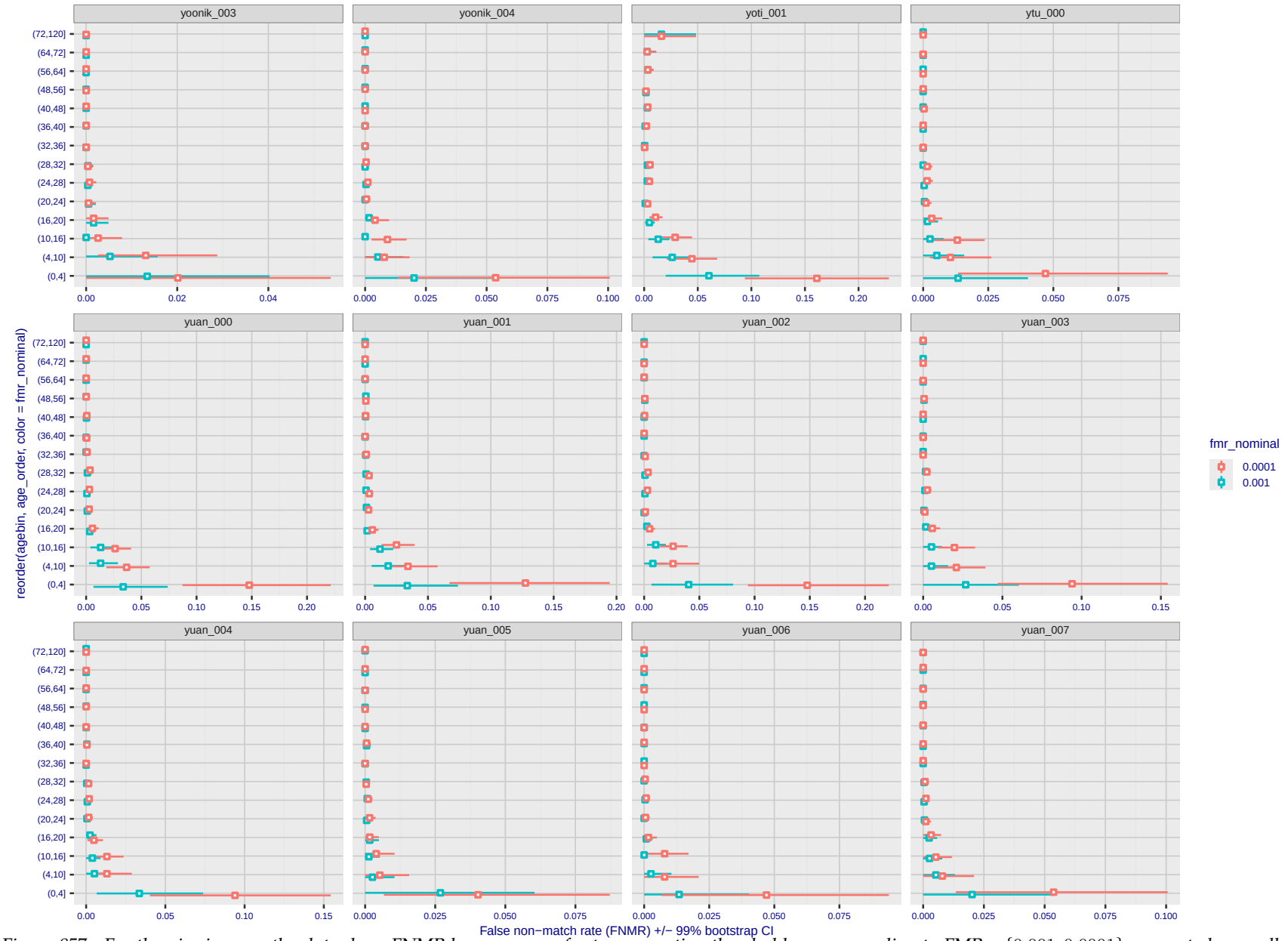


Figure 857: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

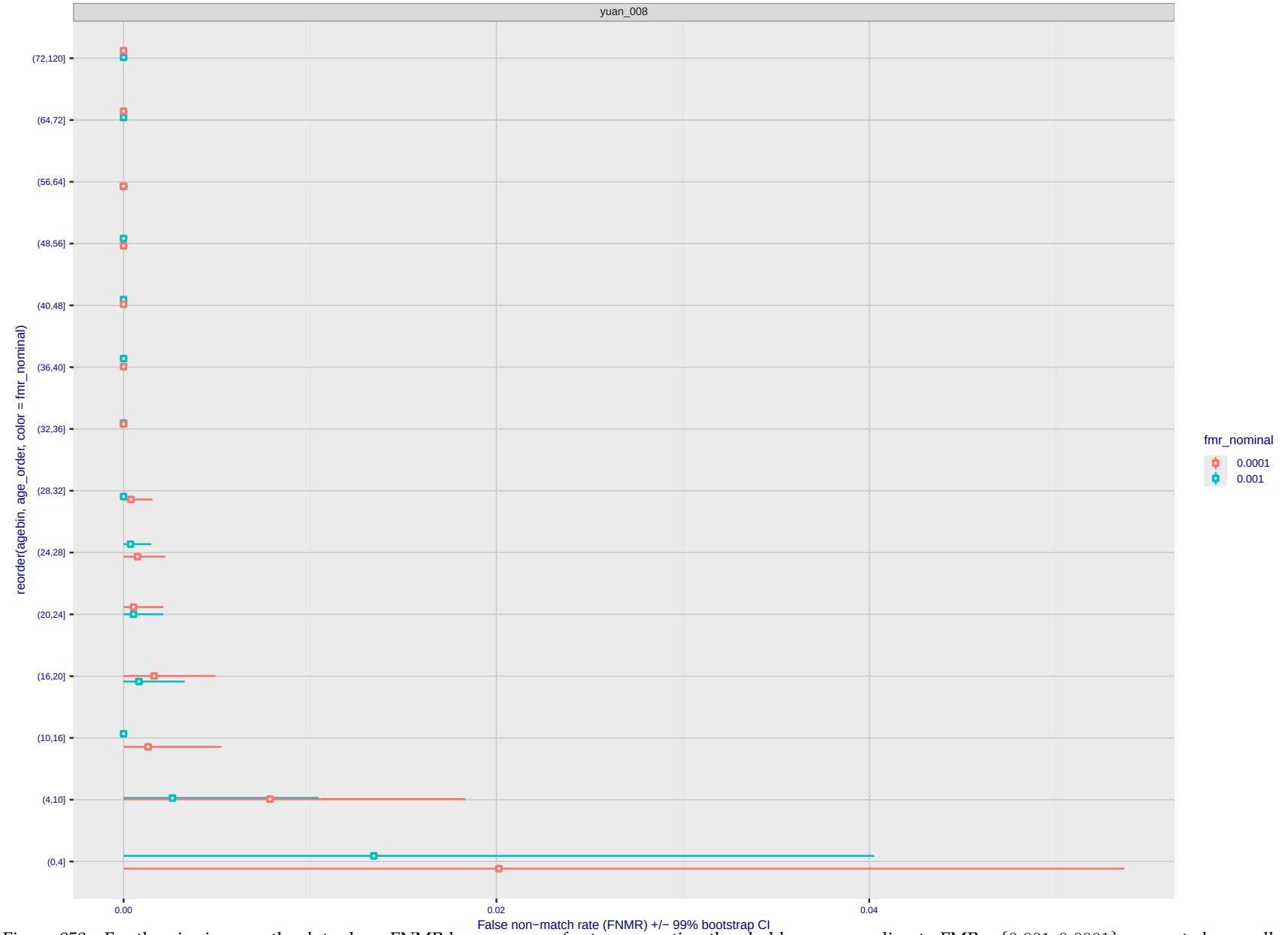


Figure 858: For the visa images, the dots show FNMR by age group for two operating thresholds corresponding to FMR = $\{0.001, 0.0001\}$ computed over all on the order of 10^{10} impostor scores. The FMR in each bin will vary also - see subsequent impostor heatmaps in sec. 3.6.2. Given a pair of face images taken at different times, we assign the comparison to the bin that is the arithmetic average of the subject's ages. This plot shows only the effect of age, not ageing. The number of comparisons in each bin is generally in the thousands, however the first and last bins are computed over 149 and 124 respectively. The error rates in some (adult) cases are zero, and in others the DET is flat so the error rates at the two thresholds are identical. The lines span 1% and 99% of boostrap replicated FNMR estimates.

2026/01/23 11:36:01 "False non-match rate" FNMR(T) "False match rate" FMR(T)

Caveats: None.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.6 Impostor distribution stability

3.6.1 Effect of birth place on the impostor distribution

Background: Facial appearance varies geographically, both in terms of skin tone, cranio-facial structure and size. This section addresses whether false match rates vary intra- and inter-regionally.

Goals:

- ▷ To show the effect of birth region of the impostor and enrollee on false match rates.
- ▷ To determine whether some algorithms give better impostor distribution stability.

Methods:

- ▷ For the visa images, NIST defined 10 regions: Sub-Saharan Africa, South Asia, Polynesia, North Africa, Middle East, Europe, East Asia, Central and South America, Central Asia, and the Caribbean.
- ▷ For the visa images, NIST mapped each country of birth to a region. There is some arbitrariness to this. For example, Egypt could reasonably be assigned to the Middle East instead of North Africa. An alternative methodology could, for example, assign the Philippines to *both* Polynesia and East Asia.
- ▷ FMR is computed for cases where all face images of impostors born in region r_2 are compared with enrolled face images of persons born in region r_1.

$$\text{FMR}(r_1, r_2, T) = \frac{\sum_{i=1}^{N_{r_1,r_2}} H(s_i - T)}{N_{r_1,r_2}} \tag{5}$$

  where the same threshold, T, is used in all cells, and H is the unit step function. The threshold is set to give FMR(T) = 0.001 over the entire set of visa image impostor comparisons.
- ▷ This analysis is then repeated by country-pair, but only for those country pairs where both have at least 1000 images available. The countries[1] appear in the axes of graphs that follow.
- ▷ The mean number of impostor scores in any cross-region bin is 33 million. The smallest number of impostor scores in any bin is 135000, for Central Asia - North Africa. While these counts are large enough to support reasonable significance, the number of individual faces is much smaller, on the order of $N^{0.5}$.
- ▷ The numbers of impostor scores in any cross-country bin is shown in Figure 859.

Results: Subsequent figures show heatmaps that use color to represent the base-10 logarithm of the false match rate. Red colors indicate high (bad) false match rates. Dark colors indicate benign false match rates. There are two series of graphs corresponding to aggregated geographical regions, and to countries. The notable observations are:

- ▷ The on-diagonal elements correspond to within-region impostors. FMR is generally above the nominal value of FMR = 0.001. Particularly there is usually higher FMR in, Sub-Saharan Africa, South Asia, and the Caribbean. Europe and Central Asia, on the other hand, usually give FMR closer to the nominal value.
- ▷ The off-diagonal elements correspond to across-region impostors. The highest FMR is produced between the Caribbean and Sub-Saharan Africa.
- ▷ Algorithms vary.

[1] These are Argentina, Australia, Brazil, Chile, China, Costa Rica, Cuba, Czech Republic, Dominican Republic, Ecuador, Egypt, El Salvador, Germany, Ghana, Great Britain, Greece, Guatamala, Haiti, Hong Kong, Honduras, Indonesia, India, Israel, Jamaica, Japan, Kenya, Korea, Lebanon, Mexico, Malaysia, Nepal, Nigeria, Peru, Philippines, Pakistan, Poland, Romania, Russia, South Africa, Saudi Arabia, Thailand, Trinidad, Turkey, Taiwan, Ukraine, Venezuela, and Vietnam.

▷ We computed the same quantities for a global FMR = 0.0001. The effects are similar.

Caveats:

▷ The effects of variable impostor rates on one-to-many identification systems may well differ from what's implied by these one-to-one verification results. Two reasons for this are a) the enrollment galleries are usually imbalanced across countries of birth, age and sex; b) one-to-many identification algorithms often implement techniques aimed at stabilizing the impostor distribution. Further research is necessary.

▷ In principle, the effects seen in this subsection could be due to differences in the image capture process. We consider this unlikely since the effects are maintained across geography - e.g. Caribbean vs. Africa, or Japan vs. China.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

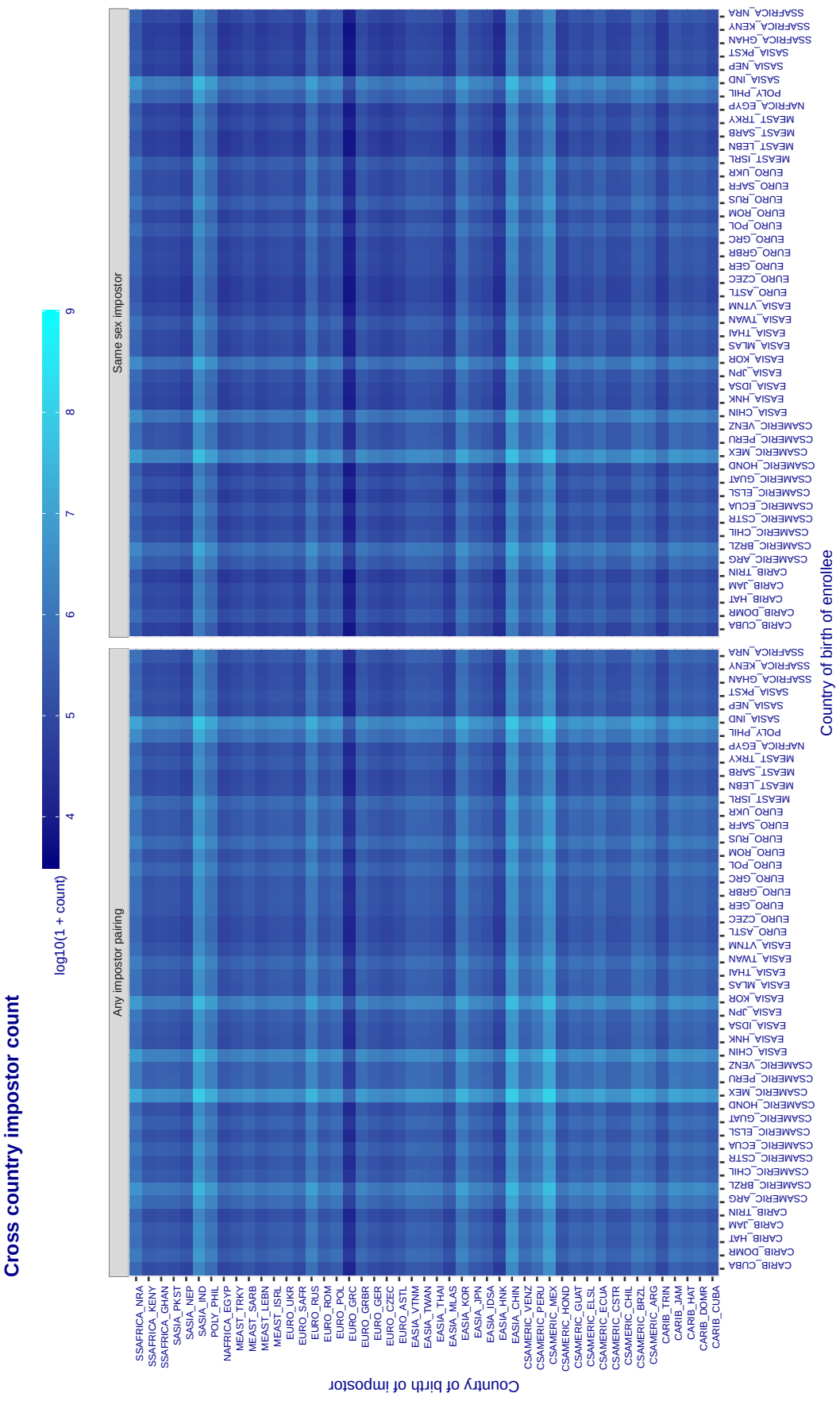


Figure 859: For visa images, the heatmap shows the count of impostor comparisons of faces from different individuals who were born in the given country pair. The FMR heatmaps themselves appear in the 1:1 report cards, for example, this one.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

3.6.2 Effect of age on impostors

Background: This section shows the effect of age on the impostor distribution. The ideal behaviour is that the age of the enrollee and the impostor would not affect impostor scores. This would support FMR stability over sub-populations.

Goals:

- ▷ To show the effect of relative ages of the impostor and enrollee on false match rates.
- ▷ To determine whether some algorithms have better impostor distribution stability.

Methods:

- ▷ Define 14 age group bins, spanning 0 to over 100 years old.
- ▷ Compute FMR over all impostor comparisons for which the subjects in the enrollee and impostor images have ages in two bins.
- ▷ Compute FMR over all impostor comparisons for which the subjects are additionally of the same sex, and born in the same geographic region.

Results:

The notable aspects are:

- ▷ Diagonal dominance: Impostors are more likely to be matched against their same age group.
- ▷ Same sex and same region impostors are more successful. On the diagonal, an impostor is more likely to succeed by posing as someone of the same sex. If $\Delta \log_{10}$ FMR $= 0.2$, then same-sex same-region FMR exceeds the all-pairs FMR by factor of $10^{0.2} = 1.6$.
- ▷ Young children impostors give elevated FMR against young children. Older adult impostor give elevated FMR against older adults. These effects are quite large, for example if $\Delta \log_{10}$ FMR $= 1.0$ larger than a 32 year old, then these groups have higher FMR by a factor of $10^1 = 10$. This would imply an FMR above 0.01 for a nominal (global) FMR = 0.001.
- ▷ Algorithms vary.
- ▷ We computed the same quantities for a global FMR = 0.0001. The effects are similar.

Note the calculations in this section include impostors paired across all countries of birth.

FNMR(T) "False non-match rate"
FMR(T) "False match rate"

Accuracy Terms + Definitions

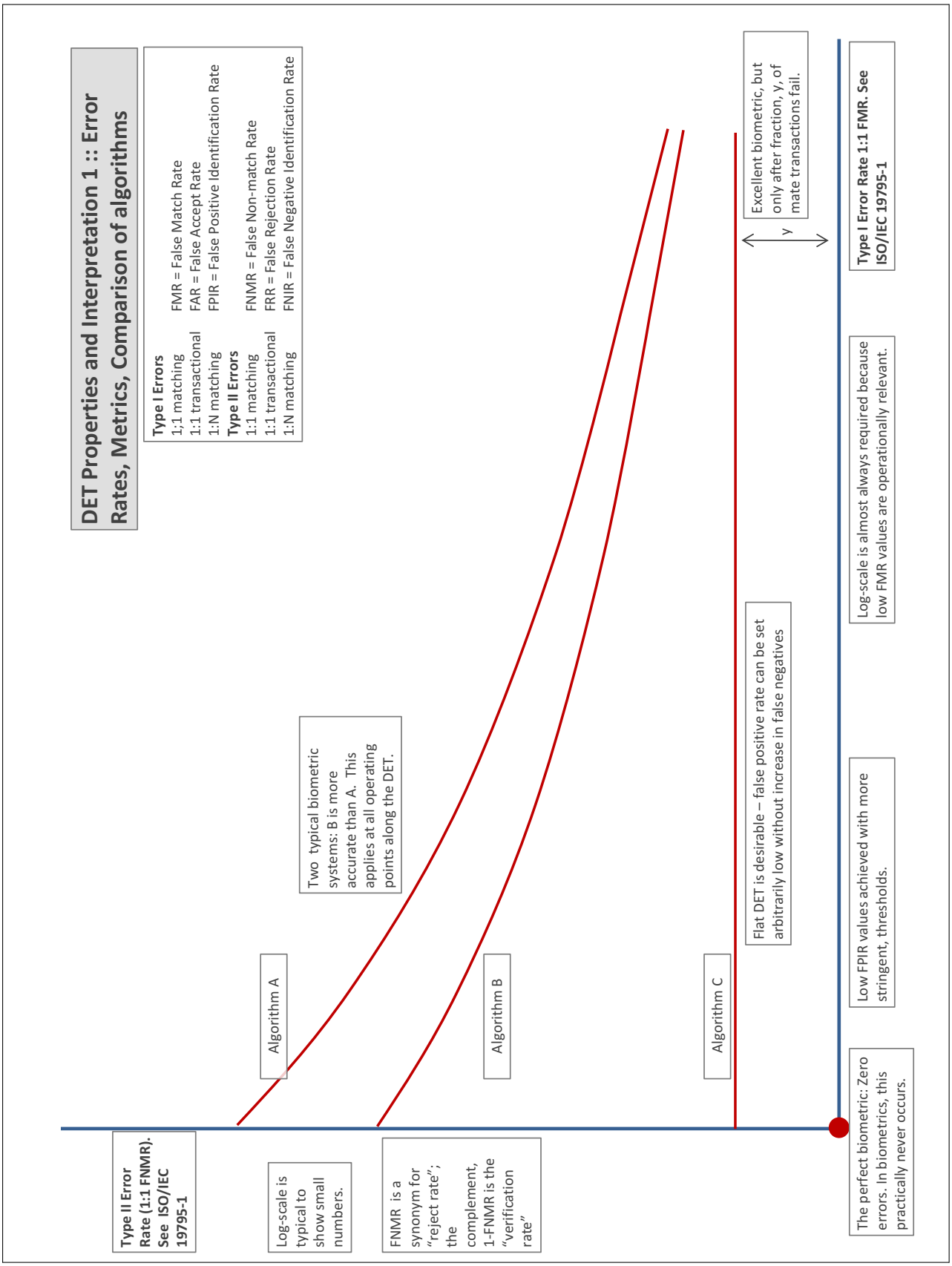
In biometrics, Type II errors occur when two samples of one person do not match – this is called a **false negative**. Correspondingly, Type I errors occur when samples from two persons do match – this is called a **false positive**. Matches are declared by a biometric system when the native comparison score from the recognition algorithm meets some **threshold**. Comparison scores can be either **similarity scores**, in which case higher values indicate that the samples are more likely to come from the same person, or **dissimilarity scores**, in which case higher values indicate different people. Similarity scores are traditionally computed by **fingerprint** and **face** recognition algorithms, while dissimilarities are used in **iris recognition**. In some cases, the dissimilarity score is a distance; this applies only when **metric** properties are obeyed. In any case, scores can be either **mate** scores, coming from a comparison of one person's samples, or **nonmate** scores, coming from comparison of different persons' samples. The words **genuine** or **authentic** are synonyms for mate, and the word **impostor** is used a synonym for nonmate. The words mate and nonmate are traditionally used in identification applications (such as law enforcement search, or background checks) while genuine and impostor are used in verification applications (such as access control).

A **error tradeoff** characteristic represents the tradeoff between Type II and Type I classification errors. For verification this plots false non-match rate (FNMR) vs. false match rate (FMR) parametrically with T.

The error tradeoff plots are often called **detection error tradeoff (DET)** characteristics or **receiver operating characteristic** (ROC). These serve the same function but differ, for example, in plotting the complement of an error rate (e.g. TMR = 1 – FNMR) and in transforming the axes most commonly using logarithms, to show multiple decades of FMR. More rarely, the function might be the inverse Gaussian function.

More detail and generality is provided in formal biometrics testing standards, see the various parts of ISO/IEC 19795 Biometrics Testing and Reporting. More terms, including and beyond those to do with accuracy, see ISO/IEC 2382-37 Information technology -- Vocabulary -- Part 37: Harmonized biometric vocabulary

FNMR(T) "False non-match rate"
FMR(T) "False match rate"



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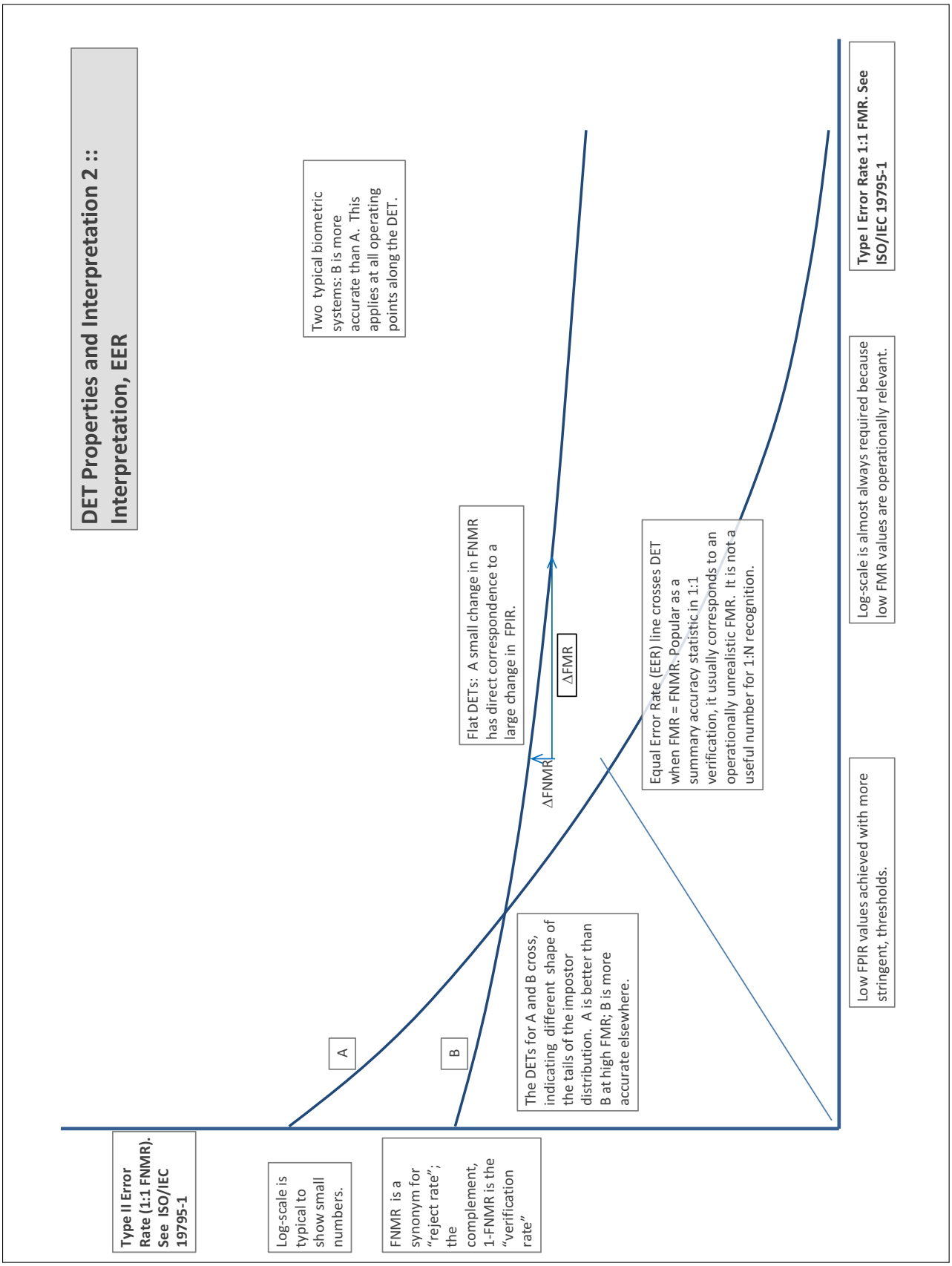
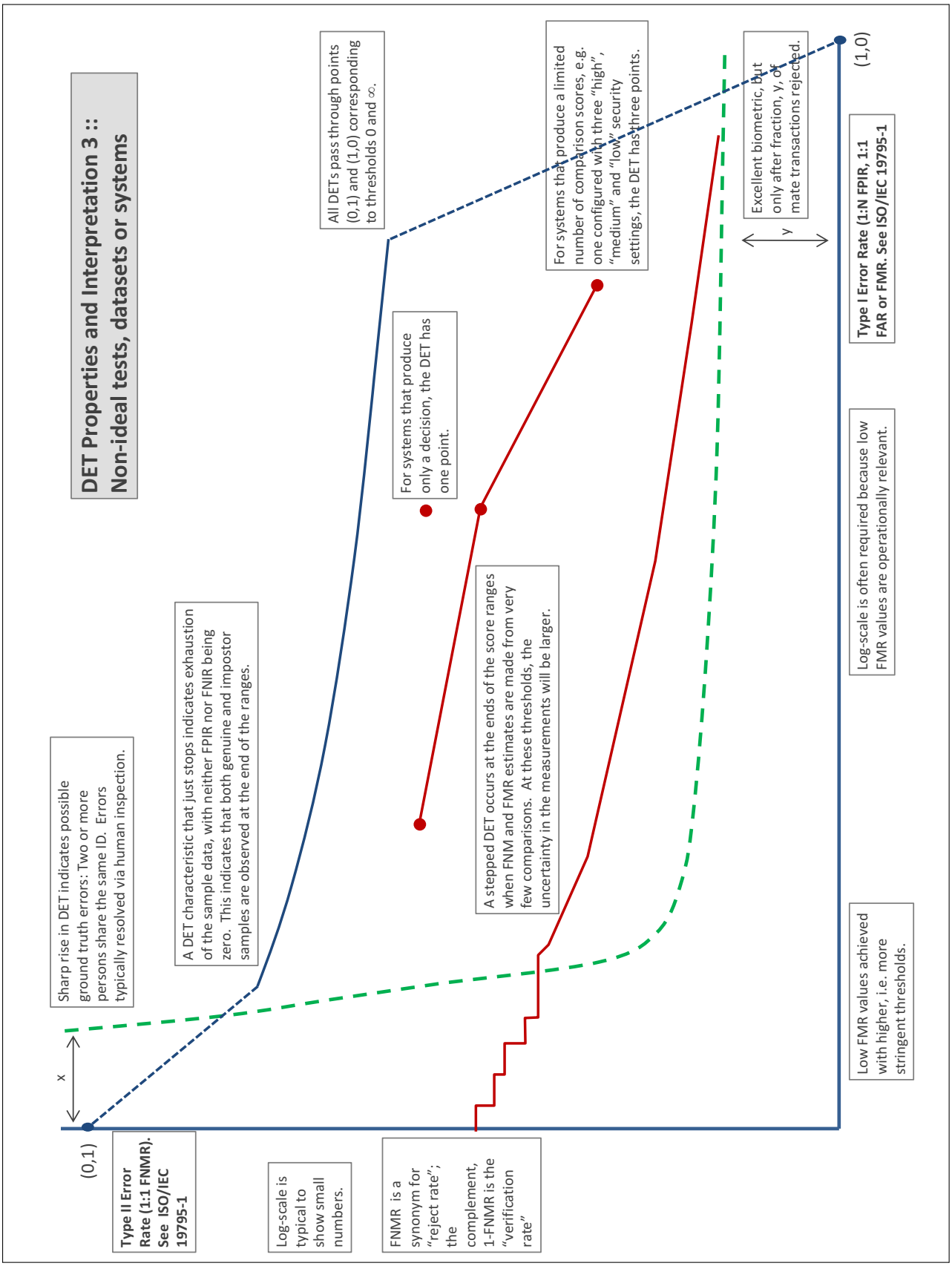
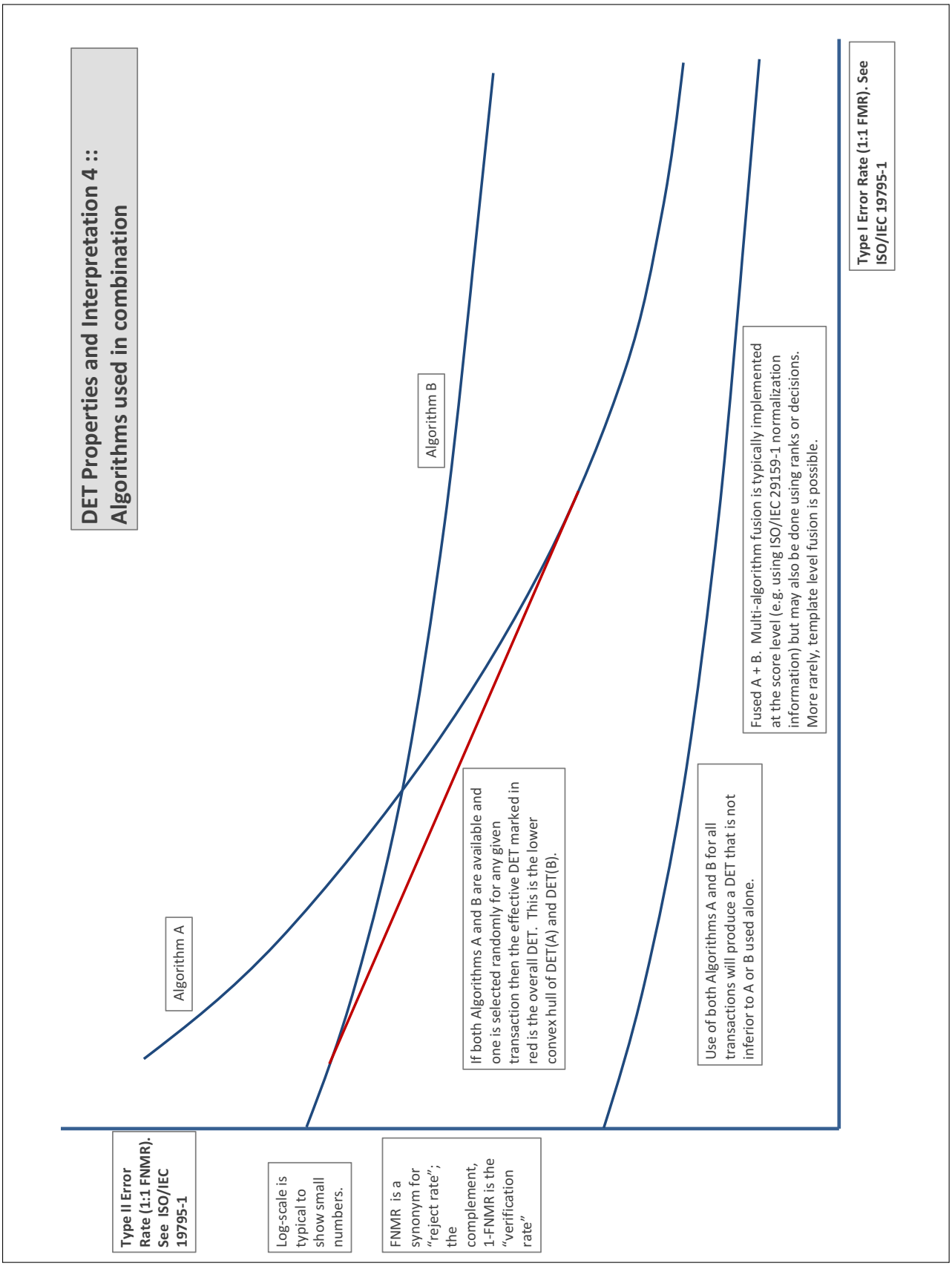
FMR(T) "False match rate"



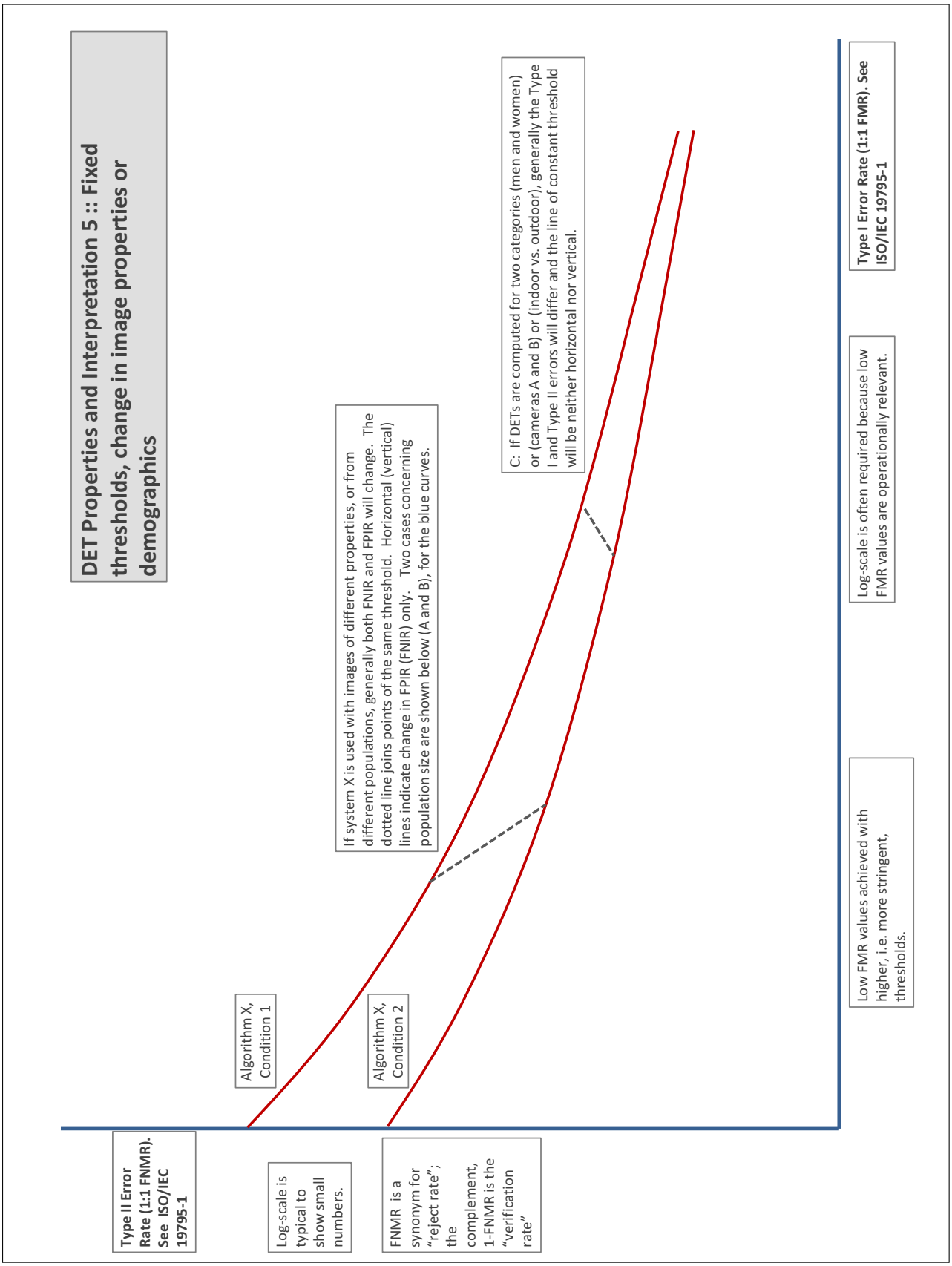
FNMR(T) "False non-match rate"
FMR(T) "False match rate"



FNMR(T) "False non-match rate"
FMR(T) "False match rate"



FNMR(T) "False non-match rate"
FMR(T) "False match rate"



FNMR(T) "False non-match rate"
FMR(T) "False match rate"

References

[1] P. Jonathon Phillips, Amy N. Yates, Ying Hu, Carina A. Hahn, Eilidh Noyes, Kelsey Jackson, Jacqueline G. Cavazos, Géraldine Jeckeln, Rajeev Ranjan, Swami Sankaranarayanan, Jun-Cheng Chen, Carlos D. Castillo, Rama Chellappa, David White, and Alice J. O'Toole. Face recognition accuracy of forensic examiners, superrecognizers, and face recognition algorithms. *Proceedings of the National Academy of Sciences*, 115(24):6171–6176, 2018.

FNMR(T) "False non-match rate"
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