MICCAI 2025 — Daejeon, REPUBLIC OF KOREA

MICCAI

Special Interest Group for Biomedical Image Analysis Challenges (SIG-BIAS)

SIG Board

- Lena Maier-Hein (President)
- Annika Reinke (Secretary)
- Olivier Colliot (Treasurer)
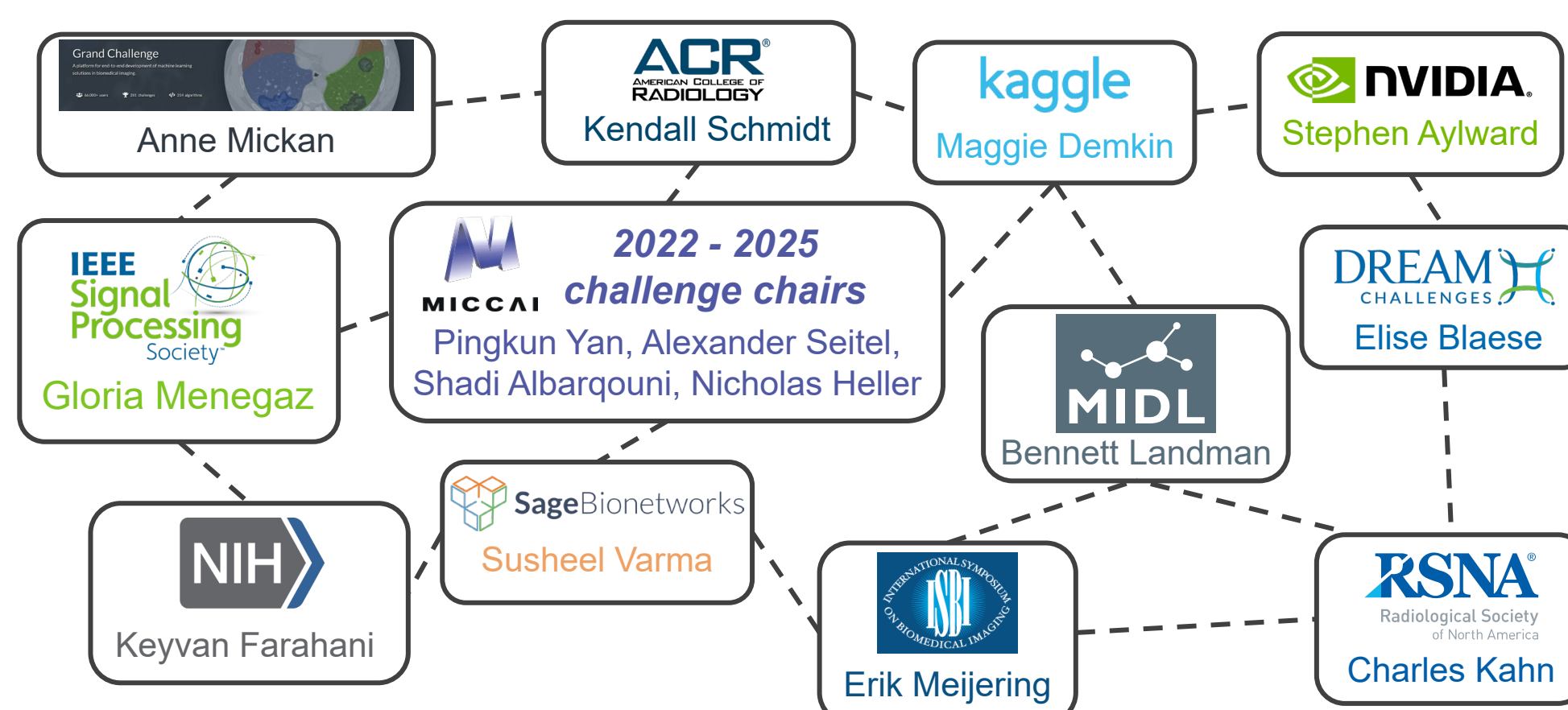- Bennett Landman
- Spyridon Bakas
- Michal Kozubek
- Nicholas Heller
- Alexandros Karargyris
- Annette Kopp-Schneider (Statistical Advisor)

SIG members

- Anne Mickan
- Kendall Schmidt (ACR RADIOLOGY)
- Maggie Demkin (kaggle)
- Stephen Aylward (NVIDIA)
- Gloria Menegaz (IEEE Signal Processing Society)
- 2022 - 2025 challenge chairs: Pingkun Yan, Alexander Seitel, Shadi Albarqouni, Nicholas Heller (MICCAI)
- Elise Blaese (DREAM CHALLENGES)
- Bennett Landman (MIDL)
- Keyvan Farahani (NIH)
- Susheel Varma (SageBionetworks)
- Erik Meijering
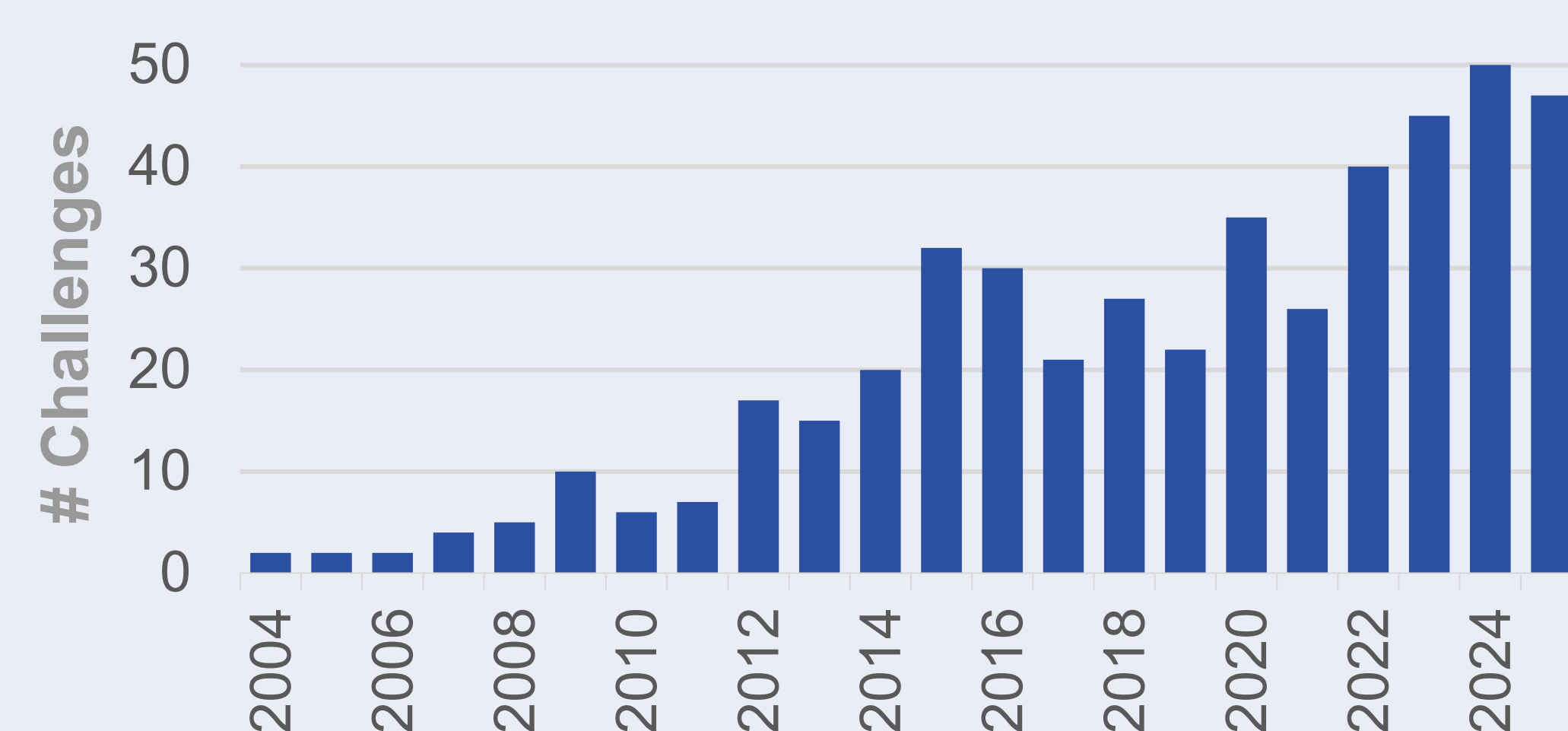- Charles Kahn (RSNA)

SIG Mission

Best practices for the MICCAI community: The SIG aims to **build consensus regarding standards and best practices** by fostering inclusively and integrating the expertise of the international SIG-specific laboratories in academia and industry. This has the potential to **lead to better quality, reproducibility, interpretability, and transparency of benchmarking studies**.

Leading role in method benchmarking: Major machine learning conferences are increasingly attracting submissions from MICCAI, but credible benchmarking practices require domain expertise. The **MICCAI society uniquely positioned to become the leading organization with respect to systematic benchmarking of biomedical image analysis algorithms**.

Assistance in challenge-related aspects: The SIG is **assisting MICCAI in handling challenge-related aspects**, such as the review of applications for challenge organization or endorsement.

The number of MICCAI challenges per year is increasingly rising, reflecting their high impact: challenges drive the research field with new datasets and by producing new state-of-the-art methods.

Get involved!

Do you have an idea for a webinar? Want to change challenge practice? Contact us!
miccai-board-challenge-wg@dkfz-heidelberg.de

Do you have specific feedback on challenges? Use our anonymous feedback survey.

Science

- **Metrics Reloaded: Recommendation framework** guiding researchers in the problem-aware selection of metrics
- **Comprehensive** common point of access to information on **metric-related pitfalls**
- **Study on 80 challenges** investigating **winning solution characteristics** and **common participation strategies**
- Study on **false outperformance claims** when using bold-faced numbers in results tables
- **Advanced visualization and results interpretation** for challenge and benchmarking results
- **Reporting guideline** for transparent and complete reporting challenges
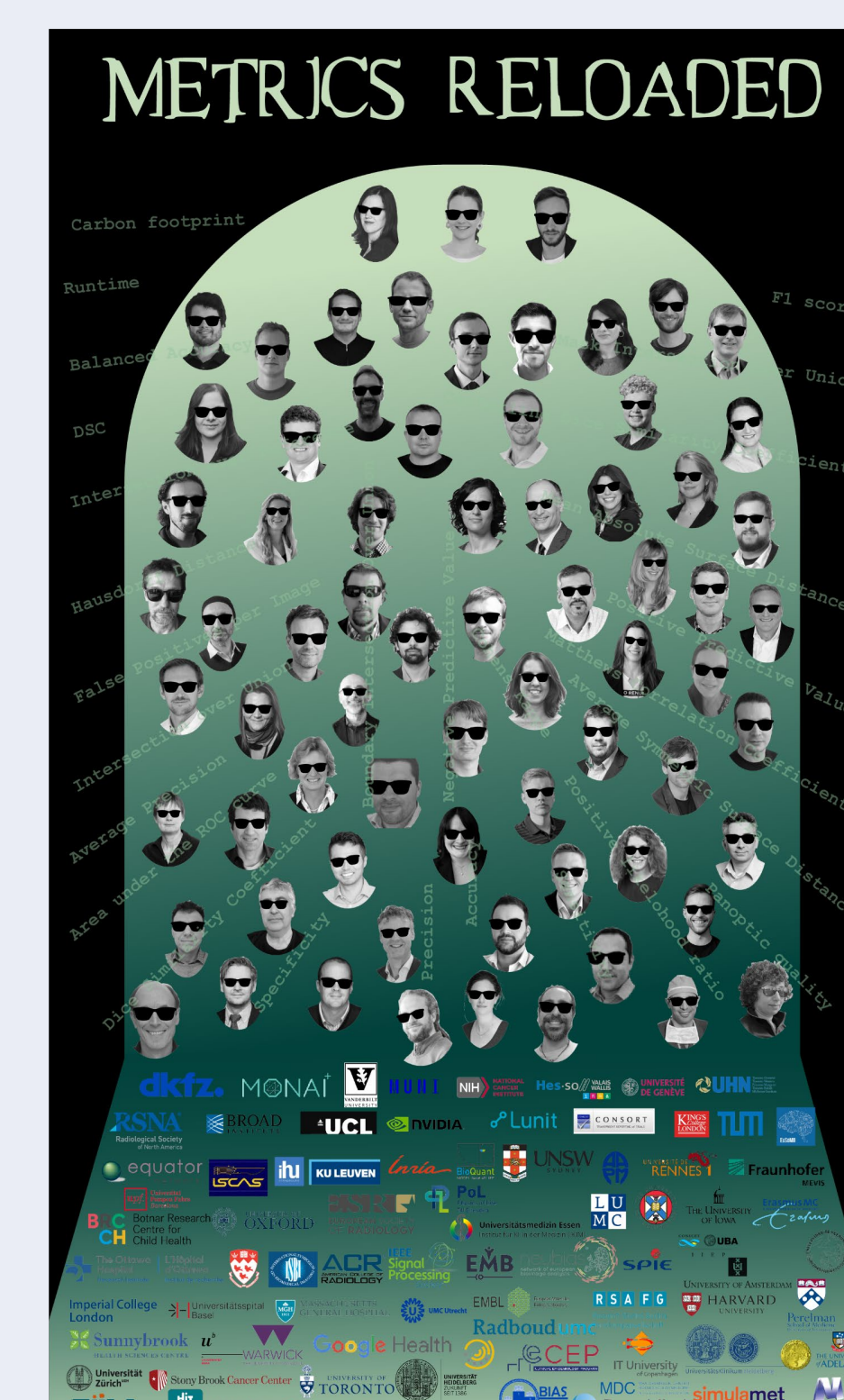
Ongoing initiatives

- Metrics Reloaded: image reconstruction and image synthesis
- Metrics Reloaded: surgery
- Foundation model pitfalls
- Data sharing and licensing practices in challenges
- Medical Imaging AI challenges we aim to solve by 2035

METRICS RELOADED

Education

Webinars

Our webinar series aims to educate researchers on how to successfully participate in and conduct challenges, focusing on quality control and validation.
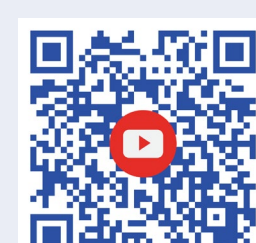
Past webinars:

- How to **win** a challenge
- How to **run** a challenge
- **Metrics Reloaded**
- **Reporting practices**

Upcoming webinar: October 2025: Beyond the benchmark dataset – Real-world generalizability and regulatory challenges in medical AI

Online toolkits

To make our science easily accessible and usable, we have converted the theory into web toolkits free to use!

- **Metrics Reloaded:** A framework for trustworthy image analysis validation
- **Rankings Reloaded:** A toolkit for visualizing benchmarking results

Infrastructure

Structured challenge review system

To enforce compliance to the reporting guideline, a peer review process for challenges was developed through a structured challenge submission system introducing standardized challenge designs.

Challenge registration

Inspired by clinical trials, the concept of challenge registration requires challenge designs to be uploaded and updated transparently before execution, reducing the risk of manipulation.

Lighthouse challenges initiative

The SIG introduced "lighthouse challenges" at MICCAI 2025 to highlight high-impact, best-practice challenges undergoing stricter review and meeting specific criteria, including multi-centered data, and docker-based submissions.