10. More music is better music

Pelle Snickars

INTRODUCTION

In March 2014 the funk band Vulfpeck released the conceptual album, 'Sleepify', containing five minutes and 16 seconds of pure silence. The purpose was to crowdfund an upcoming world tour, and songs were specifically prompted to be available on the Swedish music streaming service Spotify – hence the title of the album. In a video posted at the same time on YouTube, band leader Jack Stratton stated that when he sat down with his band to talk about potential touring during the fall of 2014, 'they said that they would do it under one condition: that all the shows would be free.' Jokingly, he replied: 'That's not a problem – Yeah!'

In the video Stratton went on to explain 'how it works': Vulfpeck releases 'Sleepify' on Spotify, an album that 'is different from our previous albums. This album is much quieter. In fact, we believed it is the most silent album ever recorded.' Essentially, what Stratton was asking fans to do was to stream the silent album on repeat while sleeping – 'make your sleep productive' – all in order to exponentially multiply royalties from Spotify. Since the latter are only disbursed once a song is registered as a play, which happens after 30 seconds, all songs on 'Sleepify' – ingeniously given the titles, 'Z' to 'Zzzzzzzzzz' – were 31 or 32 seconds long. According to Stratton's announcement in the video, 800 streams would roughly generate four dollars in royalties to the band. 'If you stream "Sleepify" on repeat while you sleep every night, we will be able to tour without charging admission,' he concluded, all the while vividly exclaiming that if someone was unaware of what Spotify is – it's a service that's 'gonna *through in* the entire history of recorded music' (Sleepify 2014).

Vulfpeck's silent prank is illustrative of the fundamental changes the recording and music industry has gone through during the last 15 years. When music and listening behaviors are treated as discrete (and even silent) data in binary form, content literally starts to lose its meaning – at

least from a computational perspective. This is especially the case when dealing with music distribution and adjacent services. Nearly all established and emerging music streaming services today see themselves as tech companies, not curators or content producers. Even though there has never been any music without technology, the primary business of these tech start-ups is (mainly) the distribution (and gathering) of data – Spotify is no exception – and, importantly, all streams are treated equal.

Online music is also growing tremendously; the launch of, and hype around, Apple Music during the summer of 2015 is but the latest fad. Thousands of new tracks are uploaded every day, and as stated by Music Machinery – an excellent blog about the interface of music and technology – this seemingly 'endless supply of new music creates a problem for a music listener. How can you find music that you will like when there are millions and millions of tracks to choose from?' (Music Machinery 2014) As a consequence, a number of tech companies have joined (or been purchased by) the music industry and/or related streaming services, all in order to facilitate new forms of rediscovery, algorithmic recommendation systems, analyses of listening behaviors and so on. The common denominator, however, is the way in which online music and music consumption have mutated into big data. Executives, in short, see data as key to unlock completely new ways to deliver music, with the purpose of creating novel 'revenue streams through such things as better targeted advertising or personalized entertainment' (Pham 2014). This is the reason why a hyped company such as Next Big Sound can in all sincerity, and almost religiously, state that they 'believe in the power of data to transform the music industry … Every listen on the radio, every play on YouTube, every mention and follow on Twitter, every purchase on iTunes, and every concert and press mention' – all such data streams are used by Next Big Sound to envision and imagine 'the pulse of humanity.' In a nifty video at nextbigsound.com – revealingly entitled, 'Analytics in the music industry' – it's consequently argued that the need 'for tying together all this data is more important than ever' (Next Big Sound video 2014).

Other companies make related claims, yet data is persistently perceived as the crude oil of our time waiting to be refined. Gracenote, for example, is said to 'love music technology and data; it's the foundation of what we do' (Gracenote 2014). The Echo Nest – acquired by Spotify in 2014 – in addition boasts of being the music industry's leading data company. Powering music discovery and personalization, the company asserts will 'improve acquisition and engagement, innovate faster at a lower cost, and deliver best-in-class music discovery on a global scale.' What's more, The Echo Nest intelligence platform brags of being able to

synthesize 'billions of data points and transforms it into musical understanding' (The Echo Nest 2014).

Yet, meaning and understanding has little to do with actual data streams. On the contrary, by way of early communication theory one might argue that generic signal processing (and noise reduction) are instead distinctive features of various data-driven musical enterprises today. At the very origin of communication theory – or high modernism for that matter – lies a (more or less) mute meaninglessness since the semantic aspects of communication were once deemed 'irrelevant to the engineering problem' (Shannon 1948). Claude Shannon's often misunderstood declaration was formulated only four years prior to John Cage's conceptual piece 'Four Minutes Thirty-three Seconds of Silence' from 1952. As it happened, Spotify's spokesman Graham James was, hence, spot on when commenting on the silent album 'Sleepify': 'This is a clever stunt, but we prefer Vulpeck's earlier albums. 'Sleepify' seems derivative of John Cage's work' (Ramirez 2014).

DATA-DRIVEN MUSIC

One of the core motives underlying the disruption process within the music industry during the last two decades has been the establishment of vast online music archives – that is, databases of easily accessible content. In this chapter, I will make the claim that throughout recent digital shifts and changes more music has been a recurring lead metaphor and marketing strategy for the music industry and symbiotic pop-up services, all eager to distribute a never-ending tail of tracks. However, I will refrain from discussing corresponding tendencies from a listener perspective, such as, for example, algorithmic and personalized music curation. What interests me are instead the ways in which swelling musical databases at streaming services are – or can potentially be – undermined or even subverted, either in computational form or via ingenious human actions. In essence, I argue that more music doesn't necessarily mean better music as most marketing hype would have it. On the contrary, through different aggregators, content at streaming services and platforms are today semi-open to (sometimes) contradictory forms of automated music, bot logics, fake listeners and the likes, various proxy deceits, piracy and even hacks. Regarding Vulfpeck's stunt, for instance, claims have been made that Spotify should have acted much more determinate to get rid of the band's silent non-music. Fans were able to 'listen' to 'Sleepify' for more than seven weeks, after which Spotify (in May 2014) silenced the album.

Interestingly – accentuating the notion of treating listening behaviors as data – Vulfpeck's idea was that the planned world tour would be correlated to cities and places where the album was frequently streamed: 'also we are going to base the routing of the Sleepify tour on where 'Sleepify' is happening the most' (Sleepify 2014). In other words, the data-driven prank was smart in more ways than one, in effect causing considerable debate. Some hailed the release as a clever idea, others – although mostly from an industry perspective – argued that streaming services should impose stricter 'regulations for this sort of "hack".' Otherwise the effect might turn viral and trigger 'a damaging slippery slope' (Lyynks 2014). So-called streaming fraud has consequently generated worries within the music industry, not the least since these types of witty tricks tend to get public attention. The artist Brado Popcorn, for example, released 'A Tribute to Vulfpeck's Sleepify' – a 'song' in the form of 33 seconds of distorted noise.

My general claim in the following is that the handling and treatment of music as data is one defining impetus for increased activities around an elaborated hoax as 'Sleepify,' but more importantly so regarding automatic music content production and bot logics. I will argue that we are currently witnessing the contours of a gradual transition, where music (bit by bit) is redefined as a data-driven communication form. Rather than being primarily designated as an audible media format, streaming music suggests a variety of interlinked formats, activities and patterns – at least from a computational perspective. Indeed, as Patrick Vonderau has argued, the concept of streaming

> promises to be of interest to media theory similar to 'television,' 'broadcasting,' or 'flow,' if only because of the ways it negates or renegotiates the meaning of those earlier media metaphors. In the current sense of the word, streaming does not refer to the wide territorial dissemination, planned (dis-)order, and real-time experiences of established media [instead] streaming seems most closely linked to an economic belief in a conversion of values. (Vonderau 2014, p. 2)

Importantly, these developments are determined and facilitated by tech companies – hooked to streaming services in different tie-ins – as these intensify their commercial role within the music industry at large. Apple's neat acquisition of Beats Music (a purchase of three billion dollars) comes as no surprise, in effect preparing the former's full move into the streaming music market during the summer of 2015 with the launch of Apple Music – and importantly so by including the latter *into* the iOS operating system.

'[You'll] have to realize that music is much more than just digital files; it breeds and bleeds and feels. To do that you'll need more inside your skull than a circuit board – because code can't hear Bowie in a band's influences,' the saying went in one of Beats Music commercials (Reznor 2014). Yet, in computational form, music does lose its media specificity and instead becomes part of different coded processes, interlinked systems and user-generated data streams. Since computational media by definition can be reduced to algorithms and a data structure, music becomes detached from its particular traits when transformed into bits and bytes (Manovich 2013). At the same time, Shannon's 'engineering problem' and the apparent meaninglessness ascribed to media reappear. The reason is that code (and software) differs from other media since it doesn't have meaning – only function. The only purpose of code (understood as statements written in a particular programming language) is to be able to run in a computer, that is, being executable following encoded instructions (Chun 2011). Programmers naturally understand the semantics of code. Still, for various engineering problems concerned with, for example, analytics at streaming services, music is by and large deprived of meaning when treated as data. However, this is not to state that music and listening behaviors are transparent and self-evident – data doesn't simply exist, it has to be generated. 'Data are familiarly "collected," "entered,", "compiled," "stored," "processed," "mined," and "interpreted",' as Lisa Gitelman has put it. 'Less obvious are the ways in which the final term in this sequence – interpretation – haunts its predecessors' (Gitelman 2013, p. 3).

Then again, what interests me is the fact that when music and listening practices are treated as data, they can – and will – with some coding skills be altered, tinkered with or even algorithmically manipulated, following one (or the other) principle of new media. Music and listening behaviors in the form of numerical representations transform the identity and specificity of music as new media regarding, for example, modularity, automation, variability and transcoding. Vulfpeck's prank is but one example; the (short lived) Eternify site was another, were one could enter the name of a favorite artist and start playing their songs on repeat in 30-second increments in order to increase revenue. As a consequence, there are at present different more or less sophisticated ways of subverting the archive and dismantling the importance of streaming services' back catalogues, not to mention new automatic ways of composing songs. On music streaming platforms there are, for instance, millions of unplayed songs – which less successful artists, consequently, seek to promote by computational means. Software that writes music by itself, note by note, is also becoming increasingly common. Jukedeck, for

example, automates the process of composition, and via responsive music software users can choose from genres like techno, jazz or classical.

MUSIC NON STOP

It almost goes without saying that streaming services wouldn't have been able to gain global and rapid popularity if it hadn't been for the huge back catalogues of music providers. The number of tracks available at popular music streaming sites have during the last ten years been constantly promoted to entice prospective listeners – even if the affirmed uniqueness of particular services has swiftly become totally habitual. The media history of Apple's iTunes Music Store, for example, can easily be reduced to a story about increasing figures and sales, multiplied numbers of songs downloaded and a constantly swelling back catalogue (Arditi 2014). 'The iTunes Music Store … offers an extensive music library of over 700,000 songs in each country,' Apple boasted already a decade ago (Wayback Machine 2004). Meanwhile, Xbox Music nowadays claims 30 million songs, Grooveshark 15, Deezer and Rdio 20, SoundCloud 16, Last.fm 12 (all according to the latest figures). Spotify has some 20 million songs on the service, with 20 000 new tracks added every day. The marketing catchphrase of more music is found almost everywhere: 'Your music library – built step by step' (Deezer), 'Unlimited Music Everywhere' (Rdio), 'Millions of songs. Find yours' (Grooveshark). More music, indeed, seems to be better music.

From an archival perspective, one important consequence of this development is that content and previous content has become inseparable. For an artist, a new album can easily be promoted together with all prior releases (as long as they have also been digitized). Downloadable or stored online, musicological visions of totality and all-inclusiveness are, thus, common discursive traits, with claims that one is going to 'through in' the whole history of recorded music as Jack Stratton admiringly put it. The notion of the celestial jukebox has, of course, been the most prevalent idea(l) within this archival discourse. It was the first dominant vision of a networked database of consumable on-demand music proposed already two decades ago (Goldstein 1994). Digital purchase of individual songs then became a widely promoted solution, spearheaded by the iPod, iTunes and Apple's palette of gorgeous mobile devices (Snickars and Vonderau 2012). Today, the most recent game changer is geared toward cloud-based streaming services of which Apple Music and Spotify are the most salient ones – or as the *New Yorker* recently stated:

'Spotify is a force for good in the world of music, is almost Swedenborgian: salvation in the form of a fully licensed streaming-music service where you can find every record ever made' (Seabrook 2014).

Yet, when almost every song is available, finding and searching it becomes paramount. Most streaming services hence grapple with the so-called discovery challenge, that is, how to make users consume more – all in order to make the service indispensable. As a result, deep back catalogues of streaming sites market constant rediscovery. Functionalities such as Discover, Radio or Browse at Spotify, for example, are all algorithmic archival modes based on the service long-tail catalogue. Pertaining to the contemporary streaming moment, the buffet or 'all-you-can-eat' version of musical access for a set price with package subscriptions to consumers is thus dependent on a never-ending tail of content. A number of services desire nothing less than to witness increased revenue streams transform into profitable revenue dreams. Getting users hooked on a service and continue listening to more music (than they need) is perceived as key to (potential) success – even if most streaming services (including Spotify) are still far from making a profit. As a consequence, almost all of the emerging services have repeatedly stressed the importance of building a vast back music catalogue. 'With music, rediscovery is a critical part of how you listen to music,' as Spotify Chief Executive Officer (CEO) Daniel Ek has stressed in countless interviews (Dredge 2012). Still, he has also asserted that music 'isn't just about providing a large catalog of songs, but about understanding the context in which people listen to music' (Pham 2014).

Under the computational hood at streaming services, however, all streams are equal. Every stream (silent or not) means (potentially) increased revenue from advertisers. Since Spotify Free, for example, operates similar to commercial ad-supported radio, more streams are equivalent to more usage, which is what attracts advertisers. Spotify has during the last year experimented with new advertisement formats. The 'Sponsored Session,' for instance, lets freemium users watch a brand-sponsored 15 to 30 second video spot in exchange for 30 minutes of uninterrupted, ad-free music. In this regard, more music is better music – both for advertisers and streaming platforms. Constantly adding new music to the back catalogue, thus, entails increased consumption, or at least the capacity thereof. Following basic economics around supply and demand, a wider offer will expand usage, independent of quality of content available.

This is one of the reasons why streaming services are more likely to include (rather than reject) various forms of (semi-)automated music, sounds and audio bot logics than, for example, sites where users actively

purchase and pay for individual downloadable music (like at the iTunes store). One wouldn't assume, for example, that Spotify contains tracks entitled 'Aircraft Lavatory Ambience,' 'Weight Loss Hypnosis,' 'Car Alarm on City Side Street,' 'Beach Rain,' 'Spend Less-Stop Waisting Money Subliminal Message Therapy' or the 100-track album 'Correct Wrong Sound Effects.' The artist Prime Sound has, furthermore, specialized in various tool sound and domestic household recordings, the label White Noise Meditation in 'soothing waterfalls' and the artist/lecturer Douglas Jacoby in religion and culture – with 46 album releases appearing only in 2014. The list of similar 'music' is endless. And even if these tracks are not all automatically produced, most of them adhere to a certain bot logic that is currently redefining audio boundaries – regarding, for example, what to interpret as music.

It is stating the obvious that these tracks do not attract crowds of listeners. But they are an important part of the marketing hype around more music, and thus part of the 'all-you-can-eat' bid that streaming services offer. The analogy to a buffet is, in fact, striking. With its wide range of delicacies at a smorgasbord you don't have to be picky what you choose – you can have a taste of all since everything is included in the price. Once users of streaming services have paid the subscription fee (and got rid of ads) they don't really need to think twice about what to listen too. Taking the notion of streaming music literally, it is indeed continuous and never-ending.

However, as the idea of the stream has become dominant it's easy to perceive it as 'the natural state of things in a networked media environment [forgetting] that the stream is a creation of particular companies and thinkers' (Madrigal 2013). Commercial interests of distributors (like Spotify) and music providers (such as record labels) are hence inclined to latently collide as an effect of various intermissions between content and automatic (low quality) non-content. Swelling catalogues are a boon for streaming services, both regarding users and in terms of advertisement opportunities. Yet, record labels and (most) artists primarily wants regulated and commercialized streaming services with professional music, and not semi-open platforms with user- or machine-generated content. There is, after all, a difference between Spotify and SoundCloud. The success of Apple's iTunes Store and its App Store, with their controlled business environments, have in many ways functioned as a digital beacon for the music industry, even if Apple also received criticism due to its dictatorial deals more than a decade ago.

Circumstances, however, are truly complicated. On the one hand, streaming services mostly want to attract subscribers (as Apple Music) – and from such a perspective there are no ads, or all advertisement is

simply noise with the (implicit) intention of trying to make listeners move from freemium to premium. Increasing the conversion rate toward higher percentages of actively paying customers lies at the core of most streaming services. Alternatively, there is *no* free content; Apple Music was only free during a three month trial period. Still, 'why link free and paid?,' Ek has repeatedly asked. 'Because the hardest thing about selling a music subscription is that most of our competition comes from the tons of free music available just about everywhere.' Ek is, of course, right, and not the least alluding to the number of platforms where all content can be made available, side-stepping the aggregation phase. SoundCloud is perhaps the best example, a classic web 2.0 platform, sometimes said to be the YouTube of audio. 'SoundCloud is not dependent on a full catalogue as much as other players in this space are,' one of the founders of the site has stated. There are, instead, 'a lot of creators on the platform and only a tiny fraction of those are signed to major labels … It's really the depth of the content that differentiates the platform' (Ahmed and Garrahan 2014). Yet, SoundCloud is all about potential discovery – or the joy of simply distributing one's music – and not about the possibility of making money. SoundCloud does not feature advertisements; the site is driven by venture capital and fees for extra storage and service. Yet, even if the platform would cater to various forms of commercials, that's not where substantial sums are to be found. At Spotify, for example, premium subscribers accounted for as much as 90 percent of company revenues in 2013 (Peoples 2014). Ads thus only made up a fraction of company income.

The complicated matters are thus, on the other hand, related to various forms of streaming fraud. As was argued around the debate of Vulfpeck's prank, advertisers will likely not want to invest when their 'commercials are falling upon unconscious ears' (Lyynks 2014). Millions of unheard songs are, naturally, not especially interesting from an ad perspective. From the standpoint of the music industry, streaming services should hence in principle only distribute music with some kind of public appeal (however minor it might be). Hence, all streams ought not to be treated equal (which arguably is why the album 'Sleepify' was removed).

At the heart of the matter lies contractual and fundamental agreements (or potential disagreements) around where profits will end up in the long run – at streaming services or record labels? Again, Spotify is an illustrative case in point. During the summer of 2015 the service had grown to 70 million users world wide, including 20 million paying subscribers. In addition, the company reported more than one billion dollars in revenue during 2013. Still, Spotify has also received a wave of criticism from artists who disapprove of the service's freemium model,

and the impossibility of making music available only to paying subscribers (which Apple Music has made default). The royalty rates Spotify pays to music companies for free streams are significantly lower than for paid ones, hence the motive of including ever-more tracks (independent of musical quality). But the freemium model is also decisive for converting casual listeners to paying subscribers – where, as indicated, the real money lies.

Then again, Spotify has yet to turn a profit. As stated by its CEO, however, this could have been the case long ago if the company hadn't invested so heavily in personnel, technological expansion and – foremost – with establishing itself constantly in new markets, with the service now being available in more than 60 countries. Even if almost 20 percent of Spotify is owned by the major record labels Sony, Universal, Warner and EMI, the cardinal question is, hence, how the music industry would handle a situation where Spotify would be making millions of dollars in profit by plainly distributing someone else's content.

BOT MUSIC

During the fall of 2013 a YouTube account, 'Webdriver Torso', started uploading short sequences of abstract blue and red shapes accompanied by a pulse tone. More videos followed – in fact, 'Webdriver Torso' uploaded almost identical clips hour after hour after hour. In an article in *Wired* on obscure uploads, the tech magazine in February 2014 stated that the really weird thing about these clips was their number, at the time 'over 68,000 similar videos – each one beeps, has a series of floating blue and red bars and is exactly 11 seconds long. What could it mean?' (Tufnell 2014). There exists more than 240 000 similar clips, yet nobody has stepped forward as of yet to claim credit. Speculations have hinted toward a Swiss Google employee, still no one knows for sure. All 'Webdriver Torso' videos are slideshows with random geometrical shapes and a computer-generated wave tone. A piece of stray automation software likely generates the content.

Recently it has been argued that the algorithmic turn in media production is enhanced in ways that go beyond data-driven forecasts and demand prediction, extending into the realm of content creation. This transition is most evident within textual domains online, and Twitter bots are often used as the primary example – even if the automatic videos posted by 'Webdriver Torso' indicate similar cases in other media as well. Essentially, bots are computer programs that automatically produce content independent of human interventions. Due to its open application

processing interface (API) Twitter has an abundance of creative bots that consume, remix and approriate existing tweets. The bot Everyword, for example, tweets its way through the entire English language one word at a time, and the Pentametron bot automatically detects and retweets rhyming couplets in iambic pentameter, assembled as Shakespearian 14-line sonnets – all under the motto: 'With algorithms subtle and discrete / I seek iambic writings to retweet' (Pentametron 2014).

Estimations vary, but it's sometimes said that around a third of all web traffic nowadays is non-human. Moreover, approximately a quarter of all changes on Wikipedia – the world's fifth most popular site – are done by machines, where the Swedish Lsjbot is responsible for 2.7 million articles alone. In addition, there exist tens of thousands of semi-automatic (positive) bought reviews on Amazon, not to mention robot writers such as Philip M. Parker, who – by way of algorithmic methods that automatically generate books – claims to have written over 200 000 titles. Bot culture is all around. Using the Spotify API and other metadata, Spotibot, for example, tracks the listening habits of millions of people to 'help you find your new favorites.' By simply entering the name of a favorite band the Spotibot generates an automatic playlist. Bot culture has, thus, in many ways become a distinctive trait of the digital domain, especially regarding machine-generated metadata and content. Philip M. Napoli has even claimed that algorithms may need to be 'considered a distinct media institution in their own right within the context of the production of content' (Napoli 2014).

However, the history of music and its relation to technology testifies to automated processes being far from novel. In particular, automatic music has been a recurring motif within the history of computing. 'Supposing, for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition,' Ada Lovelace wrote in the 1840s, 'were susceptible of such expression and adaptations, the [Analytical] engine might compose elaborate and scientific pieces of music of any degree of complexity or extent' (Lovelace 1842). And in his seminal book, *Automate This: How Algorithms Came to Rule Our World*, Christopher Steiner repeatedly discusses automatic music production and the ways it has altered the industry (Steiner 2012).

As the music industry is changing, it's still difficult to assert if automatic music and sound production as well as audio bot culture at music streaming services are perceived as a real obstacle (or not). Spotify's strangest tracks, for example, do not make that much of a noise. The debate around Vulfpeck's prank suggested some worries, as well as the site Eternify (launched as a PR stunt by the band Ohm & Sport). Yet the real problems and potential troubles that may lie ahead occur at a

prior aggregation stage. When rejection criteria at music aggregators turn more or less arbitrary – depending on whether users pay a fee or not – the line between music and non-music, artist and machine becomes increasingly blurred. Bizarre tracks such as 'Overcoming Job Loss– Positive Affirmations' might not come across as music (at all), but they have passed one or the other aggregator. Principles as to what is considered music, however, vary. Interventionist methods and explorations with uploading sounds and/or music, in fact, result in quite different responses. The same music passes some aggregators, while others define it not to be music content at all. Initial findings conducted within an ongoing research project devoted to the matter, 'Streaming Heritage. Following Files in Digital Music Distribution,' suggest that aggregators respond arbitrarily – one will accept uploaded content, while another replies that the music is not the kind of content they are looking to sign up at the moment. If an aggregator is used that charges an initial sum from users, the likelihood of getting content to pass increases precariously. More interventions and research is, however, needed and the purpose of the project (funded by the Swedish Research Council) is, in short, to follow files in digital music distribution by way of digital ethnographic methods. Research is, for example, conducted and based on explorative interventions around the creation of a non-profit, digital record label – all in order to study unexpected file 'behavior,' aggregation platform strategies, processes of (de)valuation and the infrastructures that make these possible.

An underlying hypothesis is that most streaming services are open to (un)intentional and/or calculated musical tinkering, whether brought about by humans or bots since aggregation services seek to optimize their appeal – and, importantly, there are literally hundreds of services in search of customers. The blog post, 'Music Distribution Companies Compared' (promoting the service ADED.US Music Distribution), for example, features an almost never-ending list of aggregators (Bird 2014). Aggregators such as Indigoboom, Routenote and so on, in short, play an important contemporary role in defining what counts as music.

Again, this might be cause for concern, but one could also stress the ordinariness of such automation and distribution processes. When music becomes data and resembles digital content like any other, music will (whether one likes it or not) adhere to all aspects of computational logics, even the more annoying ones. Spam is the obvious example, yet the tendency to treat all automation (and particularly bots) as fakes and inauthentic is also problematic since these features are so common online – or as James Bridle has stated: 'Why are we so obsessed with this notion of the inauthentic of that which is not entirely human?' (Bucher 2013).

The bot culture currently in vogue online is not only underestimated and poorly understood, it is also much more ubiquous than regularly appreciated. Lately, however, claims have been made that various online menaces are on the rise. 'Digital advertising budgets are being spent on ads that are never seen while bot traffic silently pollutes the internet,' the *Guardian*, for example, stated in a headline (Goode 2014). More sinister are the hacker attacks that used malicious software to destroy Sony Picture's systems grabbing sensitive data, an event stirring almost global fear. In the report, *The State of Social Media Infrastructure* it is furthermore argued that the explosive growth of new platforms has created 'the opportunity for hackers, spammers, and fraudsters to target big brands and exploit the upswing in social media marketing investment' (NexGate 2014). Even if a number of companies like NexGate are using such posed threats as a way of selling protective software, social media, user-generated platforms and streaming services do resemble a modern Pandora's box: there are great opportunities to interact and engage with customers, yet at the same time there exists a dark underside exposing companies to the risks of imposter accounts, spam and abusive content. At Instagram, for example, verified accounts have started to be identified with a badge so users know what they pertain to be; the photo-sharing service has also begun to crack down on spam accounts, and deleting them rather than just deactivating them. During the fall of 2014, Twitter furthermore caused a dispute since the company refuted claims (in a report) that 23 million Twitter users were non-human bots. The figure was apparently excessive, yet false or spam accounts do make up some 5 percent of Twitter's 284 million monthly active users. Hence, around 15 million bot accounts post autonomously solely based on scripts – not to mention that the median Twitter account has only one meager follower (Linshi 2014).

Music streaming services have a lesser amount, but still a certain share of bot logics. On burnerbrothers.com, for example, spending a hundred dollars, scripts or bots will get you the same amount of 'plays & listeners on Spotify.' Furthermore, the social media promotion platform bulksocialfanshop.com states: 'it's a common fact that people look at things they like, and they like it better when they see that other people like it too.' The company boasts having all social media promotion 'in one place,' and specifically charges a hundred dollars for 50 000 plays on, for example, SoundCloud. It is described as a 'boosting' service – 'we make sure you get the most of your investment in the quickest, shortest possible time. Invest in us, take the right choice – welcome all musicians!' (Bulksocialfanshop 2014).

I would argue that the main reason for purchasing manipulated promotion in the form of likes, followers or listeners are related to streaming music services' swelling back catalogue – of unheard music. As a matter of fact, one fifth of Spotify's catalogue of more than 20 million songs haven't once been listened to by anyone. Hence, more music also means more unheard music. Or silent music – again, Vulfpeck's album seems an illuminative case in point. 'Music services love to tout the size of their catalogs,' as Mario Aguilar has remarked. 'Spotify, like Rdio, Xbox Music, and iTunes Radio all brag about their catalogs that all contain more than 20 million songs. But it's easy to forget that a huge selection of songs that nobody wants to listen to doesn't really mean anything' (Aguilar 2013). Promoting music – by automatic means – hence becomes pivotal, or at least an option for some artist.

Whether unheard music is meaningless or not remains an open question. Nevertheless, digital neglect is, indeed, a distinctive feature of contemporary computational media culture. Weird sites as forgotify.com or Petit Tube – containing the most unloved videos on YouTube, aggregated into an unwatched endless video stream – are examples of a vast amount of undiscovered content. 'Forget Me Not. 4 million songs on Spotify have never been played. Not even once,' the site forgotify.com states – with the tongue-in-cheek urge to 'change that.' Similar phenomena at Apple's App Store are so-called 'zombie apps' (with zero downloads). They have steadily increased, and astonishingly the App Store contains as many as 80 percent zombie apps (Adjust 2014).

Computational logics, hence, are not only a boon for digital business – machines also pose an automated threat with streaming services being no exception. The never-ending tail of musical content, vividly apparent and decidedly important for marketing strategies of streaming services, can thus also be apprehended from a very different perspective. Swelling catalogues can, in essence, be described as 'nothing.' Music will (often) be heard, yet millions of songs can also be designated as 'simply blocks of white noise' (Feinberg 2014).

Then again, humans can also subvert music catalogues. In fact, behind some of the contemporary audio bot logics there lurks a subject such as, for example, the artist Matt Farley, who has released over 14 000 songs. Farley writes songs on just about everything: 'Sport Music Songs' (39 tracks on great athletes), 'We Are Running Out of Food to Sing Songs About' (90 songs on tortilla and apple pie) or 'Very Sad Songs About Very Dead Animal Creatures' (85 songs about dead kittens and bedbugs). As is evident, Farley produces thousands of similar throwaway songs, with the hope that at least some will find an audience, however infinite.

Hardly surprising, the output that has reached most listeners are the prepubescent ones (to say the least) – Farley's big hit is 'The Poop Song' with 170 000 plays. He has also composed, 'I Pee When I Poop (But Not the Other Way Around,' and lately released the – quite amusingly entitled – album, 'You Thought We Ran Out of Poop Song Ideas. You Were Wrong.' Farley has been called 'everything from a "music spammer" to a "click bait star".' To get a further idea of his immense production, he has, for example, written a 366-track 'Birthday Album,' with a birthday song for every day of the year. The more interesting aspects of Farley's output are his ways to search optimize tracks. Farley hopes that fans 'searching for, say, Lauryn Hill or Stevie Nicks, will instead stumble upon Farley's "Lauryn Hill is Like Awesome and Great" or "Stevie Nicks is Awesome!"' (Holmes 2014). Since he has earned more than 20 000 dollars from his music, he seems to have succeeded at least to some extent.

There are, as a consequence, different ways where aggregating musical content, likes or plays – either bot wise or à la web 2.0 – causes risks of technological backfire and unwelcome repercussions, damaging (or at least disfiguring) the notion of what a musical archive is or ought to be. Of course, it should not be forgotten that piracy also plays a part. If the iTunes Music Store orchestrated the legal impetus toward massive musical access online (in downloadable format), illegal file sharing of music at Napster is as important a precursor. The concurrent streaming moment, in fact, owes its fair share to the logics of rediscovery established at Napster some 15 years ago. Piracy was not only about file sharing per se, it also established new forms of access to vast musical holdings and practices to use and adopt these (Andersson and Snickars 2010; Andersson Schwarz 2014). Before more music became a catchword within the music industry, it was the leading trope in P2P networks. Some would, hence, argue that piracy chasing has been the music industry's main undertaking since the millennium. Spotify is as a consequence today hailed as a salvation enterprise, which at least in the Scandinavian context (more or less on its own) seems to have finally lowered and got rid of the Jolly Roger flag. Access to tons of music in legal ways has undermined piracy, the claim goes – even if statistics in Sweden repeatedly state that piracy has remained an activity of 20 percent of users. Still, Spotify generates around 70 percent of the Swedish music industry's revenues.

CONCLUSION

Piracy is, hence, still looming around – especially if one scrutinizes the vocabulary used by streaming services. The controversy and hype around Taylor Swift's removal of her entire back catalogue from Spotify during late fall 2014 is but one testimonial around the ways in which piracy, back catalogue and advertisement discourse intersect. Even if one cannot dismiss rumors of Swift's removal being a marketing gimmick – or a conscious move to spike YouTube subscribers (which undeniably occurred) – the controversy also draws attention to the ways that streaming services perceive themselves within the new ecosystem of digital music. Then again, Spotify has hardly been alone in disputes with famous artists who complain about the lack of revenues from streaming music. During the trial period of Apple Music, Taylor Swift made similar accusations in a celebrated blog post in June 2015: 'I'm sure you are aware that Apple Music will be offering a free 3 month trial to anyone who signs up for the service. I'm not sure you know that Apple Music will not be paying writers, producers, or artists for those three months. I find it to be shocking, disappointing, and completely unlike this historically progressive and generous company' (Swift 2015).

Apple did back down, unlike Spotify where CEO Daniel Ek in an official Spotify blog entry in November 2014 tried to argued that Swift was 'absolutely right: music is art, art has real value, and artists deserve to be paid for it.' The blog post was confidently entitled '$2 billion and counting', and Spotify, it was argued, was launched 'because we love music and piracy was killing it. So all the talk swirling around lately about how Spotify is making money on the backs of artists upsets me big time' (Ek 2014).

Nevertheless, Spotify's true rationale lies within the file sharing culture so abhorred by the music industry (something Ek has also admitted). As a media solution Spotify has therefore always been part of the 'piracy problem' – and the explanation to its success has to be situated within specific media historical circumstances. Sweden is, after all, the home of both Spotify and The Pirate Bay. It remains a true irony that given today's increase in music sales, the solution to the music business' piracy issue thus lies at the very core of the detested sharing culture itself. Then again, this unquestionable fact also stresses the importance of a specific media historical analysis of the emergence of comtemporary streaming cultures. Streaming fraud, for example, is different – but also analogous – to various streaming piracy sites such as, for example, the short-lived Popcorn Time, which (for a while) made watching torrents as easy as watching Netflix.

'The smaller and lighter the universal music library becomes, the heavier it seems to pull us down,' Geert Lovink has stated in an interview with Jonathan Sterne (Lovink 2014). The enigmatic pronouncement was political, intended as a vivid call for more musical activism, since the 'musical' component of various social 'movement seems to be lacking.' Still, one might also understand and interpret the statement differently. In this chapter I have stressed the ways in which streaming services and the systems, infrastructures and software they are inscribed into – from free aggregators and open audio platforms (such as SoundCloud) to (more or less) strictly controlled premium services as Spotify – are far from robust and foolproof. The code and software that these services are built upon is often considered to be essentially unbreakable and immune to changes over time (Ensmenger 2009). Yet, various forms of bot logics are quite apparent, with the problem of maintenance and security as ubiquitous within the history of technology.

Files are sometimes said to be corrupt, and the same goes for (some) content amassed at streaming services. The hypothesis of this chapter has, on the one hand, been that digital production, distribution and consumption of music has led to a situation where particular songs are also (and always) part of the 'entire history' of recorded music, as Vulfpeck's lead singer Jack Stratton had it. More music potentially means more listeners and, thus, more consumption – leading to both increased advertisement as well as paying subscribers. The particular lure of streaming services are, after all, that they offer (almost) everything recorded. Yet, on the other hand, this sort of archival mode of online media – in the form of more music inserted into a (more or less) inflated database – also runs the risk of or (depending on perspective) has *a* techno-inherent ability to run out of control and undermine classical notions of databases/archives/collections as trusted and secured repositories of material and/or cultural content. As indicated, there are plenty of 'bot music' to be found at streaming services. Such services and content platforms thus risk becoming insubordinate – and increasingly erode back catalogues if various forms of music automatization increases.

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