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DIGITAL LISTENING

PROFESSOR TOM SERVICE

I love being a real-life listener today, don't you?

We - lucky, 21st century we - are liberated: our listening is free like it's never been before. Free from the ties that used to bind us to the heavy and environmentally consumptive objects of music's recorded history; we are free from vinyl records or wax cylinders or the shimmering plastics of compact discs; and it's all literally free, too: we don't need money to possess music, just to be connected to the network. Music has been atomised: soundwaves are in the ever-present digital ether, turned into a consequence of software instead of the result of flesh and sinew and muscle and instruments.

Music is now even free of air: it doesn't need concert halls or caves, it now needs only the tiny volume in the spaces between our headphones and our ear-drums to resonate. Music has been simultaneously etherealised and privatised: this is her music, it belongs to her and her alone, just as our musical ecstasies are now created by our own, private listening: we don't need, and music doesn't need public spaces or large acoustics or communal participation to exist. Now, all we need are our smartphones and our headphones and our bliss is complete, just like hers.

It goes on, this delirious freedom: because music is now free of the limits of our listening horizons since we don't have to listen only to our music but to every sound that's ever been shared over the ether, on the network, which means almost every sound ever made and recorded as music in human history; we are physically free even of wires that used to connect our headphones to our amplifiers; we are free in space and time; we are connected to a non-stop digital rainbow bridge of music that goes further than anything that even John Cage conceived when he said that music is all around us, we just have to tune into it. Elgar said the same thing.

But they didn't have smartphones back then, the poor saps. They didn't have these mystic rectangles in their pockets that give all of us - at least, there are nearly 3 billion smartphones in use all over the planet, nearly half the world's population - access to the entire world of recorded sound: miraculously, instantaneously. Ours is a blissful, cost-free existence in which we can surf the musickal fantastick in the eternal present tense of the digisphere however we please, wherever we please, whenever we like. You want plainchant? Done. Beyonce's latest? Easy. Birtwistle's operatic oeuvre? Can do. Janelle Monae's new album? You got it. Give us more, and more; our ears have no limits. Feed our digital musophilia, let's gorge together! We've made it, people, to the bright yellow dawn of listening utopia, the grande bouffe of the banquet of listening... Join us. Join her! Join Neil Luck and Chihiro Ono and Federico Reuben as we sound out the digital Elysium of 21st century listening!

And we are all joined throughout today's talk by our avatar who crosses the bridge from the actual to the virtual, who will take us over the threshold from the corporeal to the digital, Hatsune Miku! Miku-San, welcome - tell us about your life in the digital musical paradise!

MIKU 1... open digital landscape...



1. *Hatsune Miku* is the name of a Vocaloid software voicebank developed by Crypton Future Media and its official moe anthropomorph, a 16-year-old girl with long, turquoise twintails. She uses Yamaha Corporation's Vocaloid singing synthesizing technologies.

Tens, maybe hundreds of thousands of songwriters, musicians and producers have put their words in her mouth — the physiology of her resonators, her articulators are exploded out into a multitude of fans' Digital Audio Workstations as a dozen or so automatable parameters:

Hatsune is digital musical possibility, she is real and virtual, avatar and plushie, she is bride to Japanese men - one in particular at least, who really did marry her - and she is vessel of our digital-musical hopes and dreams, a conduit between our world and the digital hereafter.

And she may also be a harbinger of how a listening utopia curdles into an information abyss.

Because what we're really going to do - spoiler alert - in this event is to sound out the dystopia that lies behind the smiles of the promised land of freedom I've just described. Sorry. Because what's happened to music, thanks to our demands as listeners, is a microcosm of broader trends in the digital world that have destroyed the economics of creativity, that threaten our democracies, and that have resulted in the realisation - already - of consequences that go far beyond some of the wildest imaginings of sci-fi. We are through the mirror already, in a place where the cost of our digital freedom is only beginning to be counted, and there's a high price which we are all going to pay, as listeners and as citizens in the near and longer-term future, if we don't realise what's happening. We need to sort out the relationship between the information we give up, for free, willingly, legally, and often unthinkingly when we sign those privacy agreements with corporations like Google, Apple, Facebook, Amazon, Spotify, and Twitter, but never bother to read because who has time and what do they mean and I need My Social Media It's Our Right Donchaknow and I Want It Now! - the relationship between all that and how our information is being weaponised commercially and digitally against us.

Which is what this image suggests - that the algorithms that guide you to your next playlist on Spotify, or that curate your next onslaught of adverts on YouTube or Facebook, aren't benignly looking after your interests and the delirious continuation of your eternally digitally sunshiny listening future. Instead, they're doing what corporations have always done, which in this case, is to use your listening habits, along with every other part of your digital life, as bits of information that are commercially valuable: hoovering up this freely and legally rendered information to turn it into money; analysing what you listen to, because your tastes can tell them you're a potential consumer of electronics or household products, or of cars or holidays; that you're one kind of voter with one set of political sympathies rather than another. The algorithms are spying on us. Time for some music...

[ALGORITHM PIECE]

Those really are Spotify's algorithms turned inside out and the other way around by Federico Reuben: astonishing. Miraculous, terrifying, isn't it?

They are spying on us, that isn't a new idea, this far into the history of digital networking. And a lot of the concepts you'll hear in the course of this talk are derived from the work of these two: James Bridle, artist, thinker and author of *New Dark Age: Technology and the End of the Future*, and Jaron Lanier, one of the founding fathers of Virtual Reality in Silicon Valley in the 1980s, and now one of the most visionary critics of the way the digital realm operates; his book *Who Owns the Future?* is a passionate revelation of a new economics that could save us from the worst excesses of the network; Jaron is also a musician, and he sees the fate of music and the music industry as a canary down the digital mine of the future.



Here's Jaron Lanier on the way that corporations use our data - and they way that unseeing bots and what he calls siren servers abuse that information for corporate ends rather than social betterment; he's writing in 2014 - remember those halcyon days? - but the points stand even more clearly and starkly now than they did then:

Xvi:

“Our trendy gadgets, smartphones and tablets, have given us new access to the world. We regularly communicate with people we would never even have been aware of before the networked age”

- we listen to their music too, we have access to the whole of recorded sound –

“We can find information about almost anything at any time. But we have learned how much our gadgets and our idealistically motivated digital networks are being used to spy on us by ultra-powerful, remote organizations. We are being dissected more than we dissect”.

Lanier continues:

Xvii:

“Not only have consumers prioritized flash and laziness over empowerment, but we have also acquiesced to being spied on all the time. The two trends are actually one.

The only way to sell a loss of freedom”.

- what Lanier says is happening whenever we sign those privacy agreements; that's what's really happening!

“so that people will accept it voluntarily, is by making it look like a great bargain at first. Consumers were offered free stuff (like search and social networking)”

- and music streaming –

“in exchange for acquiescing to being spied upon”.

Spied upon: so we become less and less free with every song we stream, every search term we enter, every social interaction we allow the corporations to host and to monitor.

[Digital capture of Tom begins]

You're looking at a video shot by Tim Maughan in Inner Mongolia in 2014. And these are images that are another part of the story that gives the lie to the idea of the cost-free utopia of our listening. I want to trace the journey of what's happening when you press play on your mobile device to hear Bill Withers or Laurie Anderson, the connection between that push of a virtual button to the sounds emerging instantly in your headphones. The personal costs around music and information are vital to this story too, as Jaron Lanier makes clear, but there's a high environmental cost as well, which starts here in Baotou. This is the place where nearly 40% of the world's rare earth metals are mined. And these rare earths are essential in the manufacture of phones like these - some 62 elements from the periodic table are essential for its production: super-conductive and super-insulating and super-light-diffusing elements and rare metals like tantalum, neodymium, boron, indium tin oxide, arsenic, lithium cobalt oxide - as well as gold, silver, aluminium, copper, potassium and more common phenomena - just to mix my metals and compounds and species of elements.



Tim Maughan's film is of the tailings dam of the rare earth refinery in Baotou, and you can see, our shiny technology is made in a crucible that's a reasonable terrestrial simulacrum of hell. It's hardly a new story either, but the ravaging of what was pristine Mongolian field and village is shocking in itself, let alone the dangerous levels of radiation that have been measured in the mud that was reclaimed from the dam, and the exposure that workers here are routinely and inevitably afflicted with, shortening lifespans - human, livestock, and crops - denuding the environment, and providing a vivid reminder that this technology does not come from a wipe-clean factory in Cupertino, California, but has its origins in this contemporary hell-scape. These rare earth metals are a finite quantity: scientists say that at least 12 of them are irreplaceable by synthetic materials, so when they run out, so too does the world's possibility to make new phones and other mobile devices.

That's just one of the environmental costs of our listening. The other isn't to do with the hardware we keep in our pockets, but the places where the physical data of the song, the symphony, the opera, the music file are stored, and which your streaming service is accessing every time you click on that track you just have to hear.

They are places like this:

[FACEBOOK VIDEO]

and there are thousands, thousands of them all over the world. Vast warehouses with scarcely any human activity in them at all, yet these are the places in which so much human interaction and desire is networked together: you thought music was no longer a physical medium? You thought wrong... This is a tour round a Facebook server farm in Oregon in the United States in 2017...

[Digital capture of Tom ends by this point]

A server farm is simply a place in which hundreds, thousands of computers are networked together to create huge storage and network capabilities to serve the needs of our gigantic social networking sites or digital mega-corporations - they're often built on previously agricultural territory, out of town, in cheap land; just shove a massive warehouse down, no-one really knows what happens in them, and no-one really cares, and yet every time you log on to Facebook to hear that song or watch that music video a friend has shared with you, that request, that data, is processed somewhere in the world like this, whether in the US, or Scandinavia, where it's cool, or in Ireland, where taxes are low.

And images like this are proof of one of the great linguistic frauds committed by the technology companies over our imaginations; or rather, it proves our complicity in the fantastical work that we want them and our devices to accomplish. The phrase in "the cloud": the idea is that our data, every song we listen to, our music libraries, and photos, and videos, our entire digital lives, are stored not in a physical space, but up there in the cloud, in the digital ether: what more benign image is there of technology's weightless impact on the earth, what is less insidious in what it suggests is happening to our data in the way it's used, than a cloud? A lovely fluffy, squidgy technolonimbus, puffing its way along a perfectly blue digital sky.

The cloud is the wrong word in every conceivable sense. It's not up there, it's not in the air: it's down here, it's there. The mechanics of the cloud make it the most dehumanised, and inconceivable in scale and mass and sheer-stuffness among all of the products in music history. A stack of vinyl or CDs has nothing on these serried ranks of data machines.

James Bridle puts this brilliantly in his *New Dark Age*:

7-8:



“The cloud is not weightless; it is not amorphous, or even invisible, if you know where to look for it. The cloud is not some magical faraway place, made of water vapour and radio waves, where everything just works. It is a physical infrastructure consisting of phone lines, fibre optics, satellites, cables on the ocean floor, and vast warehouses filled with computers, which consume huge amounts of water and energy and reside within national and legal jurisdictions. The cloud is a new kind of industry, and a hungry one. The cloud doesn’t just have a shadow; it has a footprint. Absorbed into the cloud are many of the previously weighty edifices of the civic sphere: the places where we shop, bank, socialise, borrow books, and vote. Thus obscured, they are rendered less visible and less amenable to critique, investigation, preservation and regulation....

8:

... What evaporates is agency and ownership: most of your emails, photos, status updates, business documents, library and voting data, health records, credit ratings, likes, memories, experiences, personal preferences and unspoken desires are in the cloud, on somebody else’s infrastructure. There’s a reason Google and Facebook like to build data centres in Ireland (low taxes) and Scandinavia (cheap energy and cooling)”.

In 2012, Google opened their server farms up to the press, and here’s what we saw.

From the Bladerunner cool of the installation at Council Bluffs, Iowa, to this server-farm colouring-in kit in Georgia, with the comedy bicycle for the Sisyphean lone worker, doomed to travel from network interruption to network interruption, a purgatory of colour-coded pipes and all the world’s interaction and digital social activity happening all around you - but with no-one to talk to. Like the lone listener, cut off from all of the communities that make the music; and yet connected to all of the possibilities of the network.

Utterly alone, but utterly spied upon; utterly transparent to the all-seeing eyes of the network or the dreams of Google’s Artificial Intelligence: this is how its DeepDream programme saw a plate of spaghetti. A Lovecraftian nightmare made from the artificially intelligent bowels of the machine...

What’s going on here? Who can help us to divide the mechanics of these visions from the heart of the technological nightmare? Someone who lives there: Hatsune Miku, I implore you, return to us from the other world!

[MIKU 2]

2. On Deep Dream

Google researchers call the act of creating... an image from nothing but noise “inceptionism” or “deep dreaming”. But these entities are far from mere hallucinations... They reveal the networked operations of computational image creation, certain presets of machinic vision, it’s hardwired ideologies and preferences... In a feat of genius, inceptionism manages to visualise the unconscious act of prosumer networks; images surveilling users, constantly registering their eye movements, behaviour, preferences...

[Hito Steyerl, ‘A Sea of Data: Apropheia and Pattern (Mis-)Recognition]

Thank you, Miku-San, and the words of the visionary artist and thinker Hito Steyerl. Google turning all of us into avatars of their digital inception. Is that our purpose? Is that where our listening ends up, data for the machine?

A return to another kind of real in the consequences of our listening: Matt Brennan and Kyle Devine of the Universities of Glasgow and Oslo have collated the environmental costs of streaming our music as opposed to buying and producing the physical formats that used to carry it. Surely physical behemoths like LPs or those plastic so-called jewel cases for CDs must be much more consumptive of the earth’s resources than me pressing the virtual buttons of my phone? Just the opposite: they found, stunningly, that streaming songs is less efficient, and uses more greenhouse gases, than any other way of consuming music: that’s what the last column there means - between 200 and 350 million kilogrammes of greenhouse gas emissions are generated by streaming. Which blows out of the water the idea of our music, of our wireless listening, being free from consequence. The network is consuming our



world just as surely as any other use of fossil fuels. When we stream music, our listening is plugged in, it's the endpoint of a chain reaction that might begin on a server farm in Sweden, that might be pinged to a satellite, that might cross an ocean floor, all so that you can hear Bjork or Daniel Barenboim whenever and wherever you want to.

And all of this is having another cost: on the economics of how musicians earn a living, how they are able to survive. Across all genres, we stream more music than we consume in any other medium: according to the British Phonographic Institute's latest numbers, that's how we hear nearly 2/3rds of our music.

Informationisbeautiful.net put together a graph of how many plays it takes for unsigned artists to make a living, based on the micropayments per play that streaming services from Spotify to YouTube make to musicians. If you were to earn the American minimum wage - 1472 dollars a month, here's how many plays you need on each of the streaming platforms. The fewest - 90 thousand - is on Napster; Spotify is on 250 thousand; and the most, is YouTube, where because they pay 6 only ten-thousands of a dollar for every play of your song, you would need 2.4 million streams to earn that monthly wage. That's a lot: in fact, it's a staggering number, which shows how uneconomic the models of music production have become. As Jaron Lanier has shown, we're living in a musical era in which great fortunes are amassable by an increasingly tiny number of artists and managers. That dream of instant success driven by social networks, attainable only by the microscopically few who will ever reach the giddy heights of multiple millions of views, clicks, and plays every month, is somehow enough to sustain an anti-economy in which the world's musicians - most of them, anyway - are giving the fruits of their lives' work for free as uploads to social and streaming platforms. The industry has been hollowed out. Wealth accrues only to those at the top of the chain, and the makers of content - the musicians composers and producers themselves - are radically disempowered.

Jaron Lanier sums up the situation:

"The principal beneficiaries of the digital music business are the operators of network services that mostly give away the music in exchange for gathering data to improve [the] dossiers and software models of each person".

In an economy in which we consumers don't want to pay for anything, we had better be prepared for the apocalypse of musicians' lives that we are creating. It has happened already in journalism, it's happened in music, and it will happen across every other industry too, unless the radical repurposing of the digital economy envisioned by Lanier and others takes place.

[Lanier's idea is that we consumers, we gives up of information, should be rewarded in a system of micropayments whenever it becomes useful to those who are monetising our data, so that our contributions are recognised and remunerated. It's a long way off...]

There are consequences not only for those making music, but for all of us listening - in how we're doing it, and what music rises to the surface in this dystopia of illusory freedom but actual enslavement to those who control our data.

One of the hopes of the nearly infinite availability of all audio ever is that our curiosity would be piqued as listeners, so that our horizons could be extended rather than being continually reassured of our prejudices, and preferences.

[And in turn, that new musical forms could be made from the stream-iverse, given that there are no limitations on the sounds that make up a song or a symphony, how long they should be, or what genres they should cross or cannibalise.]

In fact, there's evidence that instead of expanding tastes and horizons, the bewildering infinity of choice has actually narrowed what we're listening to. In 2013, Ed Sheeran had 3 billion plays on Spotify, but 20% of all of the music on the service had never been streamed, never been played once. The top 1% of the most popular acts account for



75% of Spotify's total plays, so the gulf between the behemoths of beige at the top and the underground could not be starker.

The substance of what we listen to is also changing: songs are becoming shorter. There's no time for an expansive introduction to your tracks, because our listening habits haven't got time to wait around for 30 seconds before the hook: it has to be instantly definable and comprehensible, otherwise we'll just click on to the next song. And across whole genres, the figures do not support the idea of a greater diversity in the music we listen to. This is the most streamed track in the genre that's called "classical" last year, with 4.2 million plays in the UK: Ludovico Einaudi's *White Clouds*.

Einaudi's music - its magnificent melancholy mediocrity, designed with a rapier-sharpness for the needs of the aural wallpaper of Spotify's relaxing playlists, makes it the definitive sound of today's listening vernacular. It's a product made for the modes of digital consumption we treasure the most today: it sounds weightless - like those networked clouds! - but it's actually a commercial monster, with feet of clay, spewing from servers of metal and wire and earth-bound heaviness - and it's made from an exquisitely cynical turn of craft into commerce. It's pure musical information, inoffensive, neutral, pianistic 1s and zeros, turned into digital gold.

Our listening has changed our music. That's one of the themes of this whole series of talks: that our listening is implicit and complicit in everything we hear. But I didn't want it to end up like this.

And the reason that you're not hearing evidence of listening as empowerment in this supposed utopia is that we're being listened to as well.

Literally. Spied on, for sure, as Jaron Lanier has told us, watched and heard and processed and dissected - and literally listened to. You have a smart speaker at home? You're being listened to. Amazon and Google and Apple - or to give them their female technological names, Alexa and Siri - so comforting, sitting up there angelically on their clouds - except they're actually diffused over a purgatory of wires and servers... - are recording everything we tell them to. And sometimes everything we don't tell them, as some unlucky consumers have discovered when their private conversations were sent to colleagues at work, when they discovered the speaker was recording everything they said 24 hours a day.

There's a dangerous opacity about what it is that these companies are doing with these recordings: theoretically, they are not being made public - except when they are... - but they are being stored in those massive servers; our voices unambiguously telling these companies everything from our culinary needs to our sexual desires. Our phones and TVs are doing it too, by the way, secretly pairing with each other so that our smart devices can talk to each other, and sending our watching and listening habits back to the company, to the advertiser, to the stream of data going into those banks of energy-consuming servers. We are all part of the network, we are all part of the problem.

It wasn't supposed to be like this! Our listening communities were supposed to exponentially grow in depth and meaningful interaction in the digiverse, not reduce us to zombie-information-providers for the rapaciously commercial data-obsessed maw of the network. It's an inverse, dark-side revelation of how powerful we are as listeners. We're all versions of that lone cyclist among the servers, while the digital hum interfaces with itself, creating an infinity of possibilities to which we are excluded as human beings. But wasn't digital utopia instead supposed to look like this?

Unless there were some way of us becoming part of the network. Instead of resisting it, could we humans listen with the network, conjoin with it musically, truly interact with the digital denizens of the servers and make music there?

Thanks again to Hatsune Miku, we can! Miku-San, save us?



[MIKU 3]

3. On future legacy of detritus/spam left behind by an endlessly proliferating digital ‘utopia’

“Dense clusters of radio waves leave our planet every second. Our letters and snapshots, intimate and official communications, TV broadcasts and text messages drift away from earth in rings, a tectonic architecture of the desires and fears of our times. In a few hundred thousand years, extraterrestrial forms of intelligence may incredulously sift through our wireless communications. But imagine the perplexity of those creatures when they actually look at the material. Because a huge percentage of the data inadvertently sent off into deep space is actually spam.”

(Hito Steyerl: “The Spam of the Earth: Withdrawal from Representation”)

4. We have become spam, cosmic, celestial, universally useless junk data floating incomprehensibly and pointlessly through electro-magnetic all the way to the heat death of the universe.

Our dreams resisted again, even Hatsune Miku and Hito Steyerl can’t rescue us. We are lost in data-space...

5. A digital data dystopia: a bonfire of our listening vanities, in which we have given our agency as listeners over to a handful of mega-corporations, so that we are reduced to bits in the digiverse, virtual fertiliser for the server farms who hear and see and interpret and sell all that we are to the highest bidder, scorching the earth of our musical and cultural landscapes just as surely as they poison the wells of our politics and our democracy.

What can we do? How can we reclaim our agency as listeners? How can we once again not only consume and passively generate data, but participate in the creation of musical culture - as listeners always have done, as this series has tried to show, across times and cultures and contexts?

There is hope: and it’s right here, in what Neil and Chihiro and Federico are doing.

And what thinkers like Jaron Lanier and James Bridle envision. Jaron Lanier’s visions for the future are similarly for a meaningful and reciprocal interaction with technology, and an escape from the magical thinking that says all we need is more and better data, more and better artificial intelligence.

362:

“The only reason ... that you have to undervalue people [is] if you want to support the fantasy that Artificial Intelligence is a free-standing technology. We are sacrificing ordinary people at the pyramidion of our temple”.

His dream?

361: That

“individuals will be generating information that is more valuable than the poverty line. When and if a majority of the population achieves that state, then a new path to societal security would present itself”.

James Bridle’s plea at the end of *New Dark Age* is for us to think of the network; for us to understand our place relative to the technology we have created and not to be passive consumers but actively engaged participants: conscious listeners.

252:

“The technologies that so inform and shape our present perceptions of reality are not going to go away, and in many cases we should not wish them to. Our current life support systems on a planet of 7.5 billion and rising utterly depend upon them. Our



understanding of those systems and their ramifications, and of the conscious choices we make in their design, in the here and now, remain entirely within our capabilities. We are not powerless, not without agency, and not limited by darkness. We only have to think, and think again, and keep thinking. The network - us and our machines and the things we think and discover together - demands it”.

What might the music of this mutually beneficial, as opposed to one-way feeding of the maw of corporate digital greed look like, sound like? How can musicians simultaneously resist the digital drivers of big data, and use the possibilities of the medium? And how can we listeners participate in that space too?

By creating hybrids that sound out and question and celebrate the space between us and technology, that restore our agency as listeners by allowing us into the interaction, by questioning our relationship with digital media. By being live, in the moment, in the present; by being shared, here, now, with communities of listeners who are both physical - in this room - and virtual - watching in real-time on-line: by revealing this piece, this music called Phantasy - composed by Neil Luck, performed by him and Chihiro Ono and Federico Reuben - violin and electronics; real ghosts in the machine; invitations for us to listen and to create with them.

[PHANTASY]

We've heard a brief and partial history of listening in the 6 lectures that make up this series: it's the history of the future of that listening that really interests me. How we take our responsibility as listeners - to music, to each other, to our societies off and on-line - will shape all of our futures. Resist the big data server farms; recognise your power as a listener, attend to your responsibility, and celebrate your creative agency. Listen, and listen again, and keep listening...

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