Our Liquid Ambient Future
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Session Abstract

See like a camera / listen like a microphone / track like a satellite. Big beautiful data is everywhere. The sound is constant. The image bank immense. The network sends and receives everything. We remix our environment by just being present in it. We capture, post, follow, share and archive. Data becomes us. This new aesthetic of machine ambiance is at once an embodiment of our private present selves but also an ambient beautification of what lies in our wake. The machine sees the machine knows but the mechanics are invisible. How will artists, designers and film makers depict A.I. in the crowded vision streams of the future? The notion of the liquid electric is embedded in our popular cultural fictions and scientific explorations. It operates at the foundation of our interpretation of the farthermost reaches of space and the inner most structures of matter. But it also colours the wider vistas of our future networked selves and the imaginings of content designers and artists alike.

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Prologue :: The Mediated World

> The "Non–Mediated World" has become a lost country. And I think that, in some very real way, it's a country that we cannot find our way back to. The mediated world is now THE WORLD. We are that which perceives a mediated reality. I don't think it's possible to know what we've lost. We just have...I think there is a pervasive sense of loss, and a pervasive excitement at what we seem to be gaining. And they seem – those two feelings – seem to go together, in effect, to be parts of the same feeling. It's like Fredric Jameson's "postmodern divide": you have it right there. That sense of loss, and that sense of Christmas morning, at the same time.
>
> - Interview with William Gibson from the documentary *No Maps for These Territories* (Neale 2000).

In this presentation I intend to demonstrate how the concept of liquid ambience is a narrative data construct embedded in our culture, a culture that is intensely visual and deeply affected by the logic of the machine. {{**Slide /** Quote Part A}} Liquid ambience encapsulates not just aesthetics but the very meaning of data as an emergent form of knowledge making and provides the data dependent framework for the design of meaningful visual renditions of the world and the people in it. {{**Slide /** Quote Part B}} As seen through a post-Snowden-PRISM the convergence of Big Data

and Surveillance Analytics is presenting new challenges for personal data security, for the ethics of A.I. and the legality of autonomous military systems. The romance of technology and the brave new world of Big Data is an alluring development of the contemporary information society because, in many ways, in its most raw unadulterated form it is all about us as individuals, as a society – the human collective. {{**Slide**}} As such it is immensely attractive to both the commercial and the public sector and for that reason presents one of the greatest moral challenges in recent human history. What is needed here is long-term thinking. As Edward Snowden has repeatedly asked, "What kind of society do we want?"

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1. The Undercurrent

So here comes the data: the cool blue code / the buzz of the pixels / the glow of the electric lamp. Artists, engineers and scientists have been engaging with data aesthetics for some time now. Today we are surrounded by the ambience of data: {{**Slide**}} it is appearing on our wrists; {{**Slide**}} it's being employed in ground based navigation systems; it is mapping changes to the surface of the planet and attempting to describe the innermost workings of the galaxy. {{**Slide**}} Artists are using it in performance contexts and in political interventions; {{**Slide**}} maker programs that focus on coding and data as social practice abound; {{**Slide**}} musicians are becoming programmers synthesising sound into visual forms; {{**Slide**}} public organisations are augmenting their gallery spaces and museums and architectural facades continue to evolve as canvasses of data and code. {{**Slide**}} Meanwhile the cultural residue of technological activity is emerging in the most unlikely of venues in both traditional and alternative modes of presentation.

Out there above us, all around us, the geosphere is being supplemented by the "noosphere" (the mind), the liquid cloak of the universal machine. If the global information space we occupy is much like the hive-mind that Jaron Lanier critiques so presciently then how big and how all-consuming must the hive itself be? And what of the human and machine processes that hang off the edges of this bold experiment in data accumulation? Is the digital DNA of our social and private selves being compromised by this mass accumulation? {{**Slide**}}

David Lyon of Queens' University, Ontario has observed that in a post Snowden-PRISM there exists a "supportive relationship" between Big Data collection by corporations and surveillance by government that may indeed illicit disturbing ramifications for society. "Critically," he writes, "certain time-honored legal protections such as a presumption of innocence or proof

beyond reasonable doubt are being eroded within a number of western societies precisely due to the developing reliance on big-data-led beliefs that suspects can be isolated by category and algorithm." (Lyon 2014) This is creating a new form of machine dependency, of prediction and most dangerously of pre-emption. Indeed he quite disturbingly notes that "national security" in fact breeds Big Data. {{**Slide** / Operations Centre}}

This is the dark undercurrent of the liquid ambient narrative. It is dynamic, it is unpredictable and it is a commodity of both the corporate and state apparatus. Having emerged during the breathless rush towards millennial renewal during the height of Web 2.0 evangelism and a post-9/11 security environment this rabid accumulation is now a highly organised far-reaching and highly invasive practice. While we may now have some insight into how pervasive this actually is, since Snowden the world has not so much changed but it has become smaller, busier, more prescriptive, less predictable – and our identity within that world feels strangely far away – remote. Everything it would seem has a corresponding coordinate, a time stamp and a place to be. This accumulation – this gathering – is a constant permanent thing.

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2. The Permanent State of Futurism

Regarding the burgeoning internet of things and evolving modes of A.I. Kevin Kelly recently observed that "everything that we formerly electrified, we will now cognitize" (Kelly 2009). Historically, it is the narrative of electricity that sits at the very heart of digital folklore both in function and in form as our control of it has become more refined, more ingenious, more poetic. {{**Slide**}} The liquefaction of electronic data becomes the hybrid of this multiplicity of devices this independence of functionality – a digital fatalism of sorts – as we encourage the next steps in machine learning. It continues an unsettling relationship that is as old as Modernity itself this melding of human and robotics. It carries with it the same duality of romance and danger that the first Futurist sparks of electrification elicited over a century ago. {{**Slide**}}

The effect of electrification was transformative: night became day, there was light in the dark. This in turn sparked the ambitions of other urban thoroughfares in Europe and the United States paving the way for electricity's first truly commercial and very public ambient turn at the World's Fairs in Paris, New York and Chicago. {{**Slide**}} Electricity was their centrepiece attraction, as David Nye writes in *The American Technological Sublime*: "After 1881 all fairs emphasised dramatic lighting, and many made illuminated towers their central symbols – obvious examples are Buffalo's

Electric Tower (1901), San Francisco's Tower of Jewels (1915) and New York's Tylon and Perisphere (1939). {{**Slide**}} (Nye 1994).

These gaudy festivals of culture and commerce eulogised technological achievement as a form of national pride and corporate innovation much in the same way as events like CES and SXSW capture the technocultural ferment of today. They were seductive visual constructions we were now seeing the world in terms of design and technological fabrication. {{**Slide**}} In fact the language of invention is remarkably similar: streamlined design, mass transportation, telegraph communications, electrical grids and mechanical reproducibility become streaming content, additive manufacturing, knowledge communities, smart grids and machine learning.

At the 1901 World's Fair in Buffalo, New York, known as the Pan-American Exposition, the celebrated inventor and self-promoter Thomas Edison sent his camera operators to document his latest triumph - incandescent light. Known as the *City of Living Light* Edison and the fair's promoters put on a glittering show illuminating the buildings, thoroughfares and most predominately, the suitably named Electric Tower with 350,000 incandescent light bulbs. Edison's films represented the first time many American audiences outside of New York and Chicago were able to live the experience of electricity and its luminescence. {{**Slide**}} The fact that they did so through the cinematic form is significant because it signals the origin of the corporate tendencies of the techno-cultural narrative. Edison controlled the production and distribution loop for his films in a manner that would prove to be a powerful and enduring model. The films themselves "created idealised forms of machine-made night-time vision that demonstrated and celebrated electricity's ability to extend human perception across space and time". (Whissel 2008) For artists and filmmakers, night now had a new dimension.

The Italian Futurists, who were strongly influenced by the new Cubist form of abstraction, lead by Picasso {{**Slide**}} responded passionately to the new drama of electrical ambience and the wonder of the cinematic form. Like Picasso, they saw in technological image making the ability to communicate new visual associations in a world awash with electricity. This is evident in Giacoma Balla's *The Hand of the Violinist (The Rhythms of the Bow)*, {{**Slide**}} an attempt to capture and communicate the rhythm, sound and movement of a concert performance within one cinematic frame – like a GIF like a Cinemagram – a multitude of frames within a singular image. So too Luigi Russolo's iconic 1911 work, *Music* (Russolo 1911) {{**Slide**}} takes this a step further with his exploration of synaesthesia in which associations between the senses – taste, touch, sound - are represented by colour, shape and repetition. Expressed with bold reds, greens and yellows the music – the monumental sound - becomes a dynamic visible entity. If Balla's work pre-empts the moving image then certainly Russolo's creation is the ancestor to the contemporary warehouse

party – he is the DJ / the VJ / the mash-up artist – he is the dealer of experiences consumed by the sound and dwarfed by the video mapping projected above him. {{**Slide**}}

The Futurists were particularly fascinated by the potential poetics of electricity inspiring them to establish a new visual aesthetic of electrified ambience. {{**Slide**}} This is evoked in Balla's early celebration of light and machinery at the Exposition Universelle in 1900 in his work, *Luna Park in Paris* (Ottinger 2009) the sparkling merry-go-round assuming the movement and machinery of change and technological progression. For Balla, the electric lights "seemed to him to be one of the most lyrical manifestations of technical and scientific modernity" (Zippilli 2009). {{**Slide**}} This is also manifest in Carlo Carrá's *Leaving the Theatre* from 1910 (Ottinger 2009) which demonstrates the exemplary verve for electrification that the Futurists were so renowned for. By shifting electric amplification to the human condition the subjects in the frame become fiery avatars of Modernity. Here too the scene is the celebration of nightlife and the possibilities of nocturnal electrification as the human figure absorbs and redistributes the electricity of the night – like a node in the network – illuminating the street with their own fiery display.

This machine induced sensory myth making fits neatly into the foundations of the liquid ambient narrative. {{**Slide**}} Through Edison's camera lens, onto George Eastman's film, we catch a glimpse of the future through the marketing of new device technology, (circa 1901). Through the raucous use of colour and form in the paintings of the Italian Futurists that so evocatively captured the period we see the very first flecks of binary data, the sprockets of code, the mechanics of vision and the fibres of a new optics.

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3. A Dystopian Vibration

In the landscape of the C21st Data City commercial visualisation and image redistribution is the new contemporary digital aesthetic. Hyper-charged via the high contrast primary colour compositions of TV and web advertising, specifically brand and product promotion designers are conjuring a new universe, recasting the dynamics of speed, verticality, electricity, and sound in a similarly provocative cloak of technological utopianism. Woven together these elements conjure a powerful narrative of a compelling existential technological reality – one that is alive, cognisant and embedded. As Giacomo Balla and Fortunato Depero noted in the *Futurist Reconstruction of the Universe* way back in 1915, the Futurist architect, " … relies on plastic dynamism to provide a dynamic, simultaneous, plastic and noisy expression of universal vibration" (Balla and Depero 1915).

{{**Slide**}} If we consider the broadcast news stories and the accompanying graphics that populate the post-Snowden narrative, can we think of a better description of the troubled ambience of Big Data than a "noisy vibration"? And what of the perceived perils of autonomous A.I.?

It's critique has come from the most unlikely of sources and inspired the most alarmist media art direction in the mainstream press. {{**Slide**}} Firstly, in June of 2014, Elon Musk, surely the Tony Stark of modern Futurism, startled the webosphere with his claim that "we are summoning the demon" with A.I. "In all those stories where there's the guy with the pentagram and the holy water, it's like, 'Yeah, he's sure he can control the demon'" (Strange 2014); then in December Stephen Hawking observed that "primitive forms" of A.I. had their uses but "the development of full artificial intelligence could spell the end of the human race." (Williams 2014); and finally earlier this year, from Bill Gates: "I agree with Elon Musk and some others on this and don't understand why some people are not concerned." (Gates 2015)

And then of course there is the inverse of this paradigm when the intelligent systems we create to contain, catalogue and preserve our data provide our future selves with a deep visual vibration. Think of the emotional high points of two recent Hollywood futurist constructs: *Dawn of the Planet of the Apes* (Reeves 2014) and *Interstellar* (Nolan 2014). {{**Slide**}} In each film the main protagonists at critical junctures in the narrative access archived digital photos and video of their loved ones. Both films examine a declining society, a perilous dark future and yet it is the digital image reaching out from the past that sustains them and forces them to confront their own mortality – their "human-ness" – and more profoundly, the very human cost of technology's frailties.

{{**Slide**}} Or even more recently, Glenn Greenwald's reaction in the Laura Poitras's documentary, *Citizenfour*, when he sees the technical slides of the NSA'S PRISM program. For Greenwald this crystallises – as it does for Cooper and Dreyfus – the very meaning and emotional heart of the preserved data within, as Greenwald says at the time, "This is a pretty inaccessible technical document but even this is really chilling… This is massive and extraordinary – it's amazing. Even though you know it, to see it, like the physical blue prints of it and the technical expressions of it, brutally hits home in a super visceral way." (Poitras 2014)

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4. Commercial Ambience

Conversely 'traditional' tech corporations actively seek to attract consumers to their wares via the metaphorical representation of artificial intelligence and the social possibilities of their application.

Indeed, the use of visual metaphor and the distillation of language into easily deployed catch phrases and slogans – even singular symbolic motifs such as "i" and "X" – are essentially about the recasting of data into the chromatic 'vibration' of the liquid ambient narrative. This re-ordering of the universe according to the supposed technological suprematism inherent in these products and services is high-end digital media abstraction. Not only is it an appropriation of the Futurist oeuvre but also a gleaning of the distinctly contemporary notions of absence and remoteness that so characterises our experience of Big Data.

{{**Slide**}} As we watch the flow become electric performing yet another simulation of machine intelligence we must remember we have always placed technology at a safe metaphorical distance. During the late 1990s as the web grew exponentially we were enamoured by these machines of access but also somewhat terrified by their ecology of the unseen. {{**Slide**}} The rash of net-exploitation cinema that appeared in 1995 that dealt with the invisible viral perils of the liquid electric are emblematic of this hyper-Hollywood-anxiety.

We had adopted a language that emphasised an organic symbolism for that which was contained within. It was alive this web, these viruses and bugs, the mouse that could touch the cloud. {{**Slide**}} In the age of Big Data the language has become liquefied, media now streams and information flows, the data deluge is at first just a leak and then becomes a wave / a river / an ocean. {{**Slide**}}

In a liquid ambient world information is once again alive yet this time it is electric a synthetic hybrid of steel and flesh and gorilla glass. Tangible physical surfaces of interconnectedness bridged only by the fluid dynamics of motion graphics and data modelling. {{**Slide**}} Data Interpreters and media designers are the new magicians of the visual metaphor conjuring clarity a future that is clean, pure, sustainable, and within reach – well, almost. Almost because this future is a fiction, almost because the high-tech veneer is a promise that cannot actually be "experienced", almost because the future is always invariably only ever just out of reach.

Even in a literal sense, {{**Slide**}} there are many instances in which the approach to the marketing technology and information exchange is a direct extension of the chromatic colour experiments of the Futurists – particularly explorations in Orphism by Sonia and Robert Delaunay – {{**Slide**}} blending basic elements of their technique with the hybrid landscape of the information society. In the case of the Comcast, BSkyB and Samsung the link is even more explicit as their promotional collateral directly references the act of mixing paint into liquid form to represent the technological process of machines translating the physical world into data. {{**Slide**}}

Elsewhere designers have taken such symbolism a step further by utilizing cinematic production techniques to animate the *soul* and the *wisdom* of the machine via the fluid kinetic

movement of simulated electricity. {{**Slide**}} This was especially evident in advertisements released by HTC in late 2011 featuring a bristling cauldron of blue and purple electrical clouds as the devices emerge as mythical products born from some kind of intergalactic dark matter. It echoes an earlier HTC commercial in which black magnetic filings morph into HTC's flagship handset the *Sensation* and also Sony's "Fade to Black" campaign for *Playstation3* {{**Slide**}} that employed technological liquefaction albeit of a somewhat darker and most troubling consistency.

Elsewhere, {{**Slide**}} DHL the global courier service who deal in the speedy passage of physical objects and rely on accurate data collection and data sharing to facilitate that task are in many ways a truly modernist construct with a very real and tangible service. Yet DHL also inhabit a space that fuses notions of global systems with the more social aspects of information exchange. Their 2011 *"Power of Yellow"* campaign utilises the gamut of Futurist imagery even their obsession with vertiginous space is reflected in very obvious appearances by iconic buildings of the world. {{**Slide**}} The presence in particular of the Burj Khalifa in Dubai and Paris' Eiffel Tower – two Futurist icons who triumph above all other structures at alternate ends of the C20th – {{**Slide**}} instantly recall the works of Robert Delaunay in his Eiffel Tower series (between 1909 and 1914).

IBM's web clip '*Data Anthem'* was the signature commercial of a campaign that featured a lead in graphic resembling a sub atomic act of nuclear fission supposedly to denote the origins of data and its myriad of complex applications. {{**Slide**}} In a whole suite of corporate videos IBM employs to dazzling effect, the liquid electric metaphor sound tracked with a heavy measured male narration in that states: "This *is* data". All the while simulating invisible machinations of information – the currency of the new economy and the embodiment of the liquid ambient narrative.

The LG Electronics' 2008 campaign "*Advance Technology. Beautifully Hidden"* extends on this template in what is a fabulous convergence of millennial iconography. {{**Slide**}} In a taught techno-futurist dreamscape a domestic living room becomes the playground of everyday metallic household objects that morph from their more conventional forms into exotic luminescent automatons. The advert cites numerous science fiction touchstones in rapid succession, the mechanics of *Short Circuit* (Badham 1986) and the *Transformers* series of films (Bay 2007), the holographic visualisations of the original *Star Wars* trilogy (Lucas, Kershner et al. 1977-1983), the cute wobbly choreography of *Toy Story* (Lasseter 1995) and, most evocatively, the ethereal bejewelled swarm of space crafts in *Close Encounters of the Third Kind* (Spielberg 1977).

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5. The Liquid Electric

This meeting of technology advertising and the implementation of familiar science fiction references bring full circle the history of this prominent visual aesthetic. The heritage of sparkling, crackling – sometimes violent – blue electrical energy is dotted throughout early science fiction cinema from the mysterious unknowable energy field lurking on the outer edges of the galaxy in *Star Trek: The Motion Picture* (Wise 1979), to the first appearance of a visible representation of "the force" in the original *Star Wars* trilogy (Lucas, Kershner et al. 1977-1983).

{{**Slide**}} Most tellingly however is in the first incarnation of the *Tron* series of films (Lisberger 1982) a nostalgic template for the back-end of the wire mesh of contemporary 3D design. In an early sequence the "digitiser", that uses a blue electrical laser beam to decode the molecular properties of human flesh, is used to author a new virtual self, a distinctly 1980s avatar. {{**Slide**}} As fugitives inside a computer program, they later stumble upon a rippling stream of fresh water and rush to the water's edge gleefully scooping up the liquid, drinking from the shimmering stream. {{**Slide**}} While it's possible to deconstruct this as a type of "in-game reward" i.e. water, the giver of life, conveniently appearing in the path of the game players, it offers perhaps a symbolic bridge between being human and being digital. This is one of the earliest cinematic manifestations of the liquid electric form pre-empting William Gibson's cyberspace from *Neuromancer*, by creating a video game stylised interpretation of his since often-quoted description of the virtual artifice of the network. {{**Slide**}} As Gibson describes:

> A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the non-space of the mind, clusters and constellations of data. Like city lights, receding. (Gibson 1984).

This is the virtual rendition of the light on the dark, the convergent art direction of *Tron*, *Blade Runner* and *Neuromancer* {{**Slide**}} Gibson describes not only the liquid blue world of *Tron* but some seventeen years later on the cusp of the new millennium the luminescent green data trails of the *Matrix*. Gibson sets up the theoretical possibility of V.I.K.I. {{**Slide**}} the central supercomputer which controls the massive swarm of networked robots in *iRobot* (Proyas 2004). {{**Slide**}} Similarly the "precogs" from *Minority Report* (Spielberg 2002) who lie in a pool of water their minds as one, the water electric blue tapping into their own constellation of data that is the near future. {{**Slide**}} *A.I. Artificial Intelligence* (Spielberg 2001) is a stunning allegory for the more extreme possibilities of not just artificial intelligence, but data aggregation and individual profiling in a post 9/11 world. {{**Slide**}} The central protagonist, David, is a boy robot who is as far removed from his data profile, as we are from our own multi-threaded personal data trails today. David is completely unaware that

he is in fact the product of a very complex algorithm and discovers much to his silent horror that he is far from unique, and like Buzz Lightyear, {{**Slide**}} the truth of his manufactured existence is much more banal and commercially derivative than either of them would ever have expected. *A.I.* is one of Spielberg's coldest and most sombre films if you accept the premise, the machine (the "mecha") trapped in a human ("orga") world, and if you can see that David is essentially a data derivative {{**Slide**}} his fate and that of humanity drawn inexplicably together in the flooded liquid ambient boulevards of New York City, circa 2142.

Most recently in *Prometheus* (Scott, 2012) {{**Slide**}} an entire universe is rendered in a sizzling electric blue in which towering statuesque God-like figures literally design the universe via electric blue ambient interface. Most tellingly however is perhaps *Pacific Rim* (del Toro 2013) {{**Slide**}} a film that performs a neat re-routing of Manuel Castell's "space of flows" with a process known as "the drift" in which pilots are mentally linked in order to co-operatively operate monstrous robotic warriors. Each melding of minds is a convulsive moment of electric blue rushing. And in each instance, like the pre-cogs in *Minority Report*, the visual signifier refers to the origin of the parable: the man-machine symbiosis / the core / the beginning / the code.

More significantly, these images, these notions of the liquid electric, the incomprehensible technologies of the everyday and the magic and mystery of the Futurist Data City are cast against a distinctly dark, seemingly impenetrable palette. {{**Slide**}} This is also strongly evident in the replication of computer code and networked systems in the promotional collateral for large civilian and military contractors who deal explicitly with the notion of *cyber security*. The depiction of knowledge as at-risk data capital and information security as a vital process of software and machine function is inevitably signposted by the reassuring blue ambience of the liquid electric. {{**Slide**}} It is in the properties of these visual design elements that the template for a dark gothic aesthetic also emerges. And it is in these intersecting histories that the neo-gothic tendencies of a forthcoming culture of networks, of Big Data and of Big Surveillance – supplementing 'Big Pharma' and 'Big Oil' – so haunt the cinematic archive.

{{**Slide**}} There is no character - no visual icon – that is more explicitly haunted than the contemporary super human. These icons of cinema and Cold War folk lore are, of course, created of man, appearing amidst the authoring of another of the 20th century's most fantastic enterprises – the domination of man over atom. {{**Slide**}} A contemporary interpretation of Spiderman, of Batman or Super-Man cannot escape a particular type of creeping technological darkness. As they search within themselves, as they confront their human-ness, it is a gothic super hero anxiety which prevails. Doubt sets in, their powers becoming more earthly, more ungodly. {{**Slide**}} This de-evolution of their character arc is pure gothic high-tech: uncertainty about their unique gifts, their

hard–won skills, their moral compass and their place in the mortal world is their new super struggle. A familiar malaise for those of us who take human form one would presume, but not so the super coloured super hero of early 20th Century American comic book fantasy. {{**Slide**}} And so we have watched them on paper and on screen – especially on the mega screen: the IMAX screen and the 3D screen – withdraw into a gothic corner of anxiety and self–doubt. The iconography of the super hero – the costume design, the art direction, their environment and their disposition appear to darken before our eyes.

To be in this space, is not to flow, but to fall, as Bruce Sterling so poetically observed back in 2009, "… things are just falling apart, you can't believe the possibilities, it's like anything is possible, but you never realized you're going to have to dread it so much. It's like a leap into the unknown. You're falling toward earth at nine hundred kilometres an hour and then you realize there's no earth there. That's a dark euphoria feeling. It's the cultural temperament of the coming decade." (Sterling 2009) And here we are in 2015, smack-bam in the middle of it.

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6. Machine Ambience

What we have been observing thus far however are essentially historical symbols, metaphors or abstractions of liquid data. We have seen the expression of data as a transmission of information, the outcome of its analysis and its various cultural and commercial manifestations in both advertising and cinema. But what does data look like in the contemporary world? How do scientists and artists express complex data sets visually so that it can be interpreted and understood by the broader community?

There are of course many unique and powerful uses for Big Data and many of them quite legitimate commercial operations but as a society we are certainly not given privileged access to it, even if we have generated most of it ourselves. But traces of data do emerge all over the web and via the broadcast media stream as artists and scientists find new ways to not only express data visually but to give new and more detailed insights into the functions of a society that is itself awash in data.

{{**Slide**}} *The Exceptional and the Everyday: 144 Hours in Kiev* is a social media visualisation project by Lev Manovich and his team that uses Instagram's public API to collect 20,000 Instagram photos taken over a six -day period during the protests in an around Kiev's Independence Square in February of 2014. {{**Slide**}} The visualisation of this particular data set created a unique portrait of

political transformation by exploiting patterns in the data ultimately "metamorphosing social media into data landscapes". (Packer 2015) {{**Slide**}} This Manovich explains in an interview with the website Furtherfield.org is a form of expressive visualisation:

> As an artist I am also interested in the question of how can I present the world through the data. So let's say a hundred years ago I would be taking photographs of a city. {{**Slide**}} Now I can represent the city through 2 million Instagram photos. Thinking about landscape paintings in Impressionism, Fauvism, or even Cubism, how could I represent nature today through the contributions of millions of people? So I think of myself as an artist who is painting with data. (Manovich in Packer 2015)

{{**Slide**}} This brings to mind the work of James Bridle, who set the webosphere alight with his panel at SWSW on the question of the new aesthetic in 2012. In much the same way as Manovich utilizes publically available images and the parameters of time and geography to construct a set of evocative digital objects Bridle's *Dronestagram* Tumblr project collects location and casualty data on drone strikes. {{**Slide**}} The majority of records are sourced from the Bureau of Investigative Journalism from strikes reported in Pakistan, Yemen, and Somalia while the images themselves are captured from Google Maps Satellite view and posted to Instagram which then syndicates the feed to Tumblr and Twitter. As Bridle says, "These technologies are not just for "organising" information, they are also for revealing it, for telling us something new about the world around us, rendering it more clearly". (Bridle 2012) {{**Slide**}} Bridle takes a more poetic view of the penultimate moment before a night time drone strike with his photographic assemblage, *The Light of God* (Bridle 2012). Inspired by the term after it appeared in an experimental documentary film by Omer Fast, *5000 Feet is the Best*, in which a drone operator explains the Light of God phenomena. Using a thermal camera to identify the target area, the operator locks the drone's targeting system onto the site using a laser targeting marker which in turn calls in a Hellfire missile strike. To quote from the film: "We just send out a beam of laser and when the troops put on their night vision goggles they'll just see this light that looks like it's coming from heaven. Right on the spot, coming out of nowhere, from the sky. It's quite beautiful." (Fast 2011)

{{**Slide**}} Evoking the angelic light of a Christian God in a Muslim land underlines the broader complexities at work when the pointy end of data analytics is a silent act of violence. Fusing the liquid electric beams sent up by the 9/11 Anniversary Memorial, *Tribute In Light* (Carpenter and The Municipal Art Society of New York 2011) with the image of the reciprocal targeting laser of *The Light of God* this new image juxtaposition becomes – to use Sterling again – the ultimate gothic high-tech object – the smashing together of science, fiction and religion. All of it

frozen in that moment of machine assisted night vision – a dark euphoric luminance of imminent, absent and anonymous destruction. Here the residue of data sits alongside the residue of extreme violence. These are visual accounts of a deadly clash of cultures appearing as they do at the very end of a political narrative in much the same way as the War Rug phenomena in Pakistan and Afghanistan constitutes a similar residue. {{**Slide**}} In these examples of traditional craftsmanship that dates back a millennia the residue of military data analytics are reconstituted in the designs of traditional rug making and on-sold back to the West via the internet.

While these are very powerful visual images that evoke a certain type of reality, that of a very personal experience in a very visible war other artists strive to expose the unseen machinations of surveillance and data gathering. Trevor Paglen is a geographer and media artist who employs camera and imaging technology to pull back the veil on the drone network and the communication and surveillance systems of the U.S. Military and the NSA. He watches those who watch us. The aesthetic touchstone of Paglen's work is *The Fence (Lake Kickapoo, Texas)* (Paglen 2013) {{**Slide**}} which is produced from analysing the microwave frequencies of a powerful network of radar systems that envelope the territorial United States. *The Fence* is captured by making normally invisible light frequencies visible and thereby capturing the unseen and expressing this in vivid rich chromatic textures. The subject, as Paglen explains, is an "electromagnetic border that extends far into space from transmitters in Alaska, California, Texas, Massachusetts, Greenland, and the United Kingdom. The Fence is designed to track spacecraft overflying the United States and to serve as an early warning system to detect ballistic missile launches" (Paglen, 2013). This is a constant permanent structure of virtuality, a network of immense size and of immense data processing capabilities, but essentially invisible.

{{**Slide**}} However the largest and perhaps most expensive undertaking to make the invisible visible, or indeed to prove that we even exist at all is the Large Hadron Collider (LHC) at CERN and its quest to find the Higgs Boson particle (aka The God Particle). The LHC is an accelerator system for sub-atomic particles. It is attached to an imaging machine designed to capture the existence of matter: the ATLAS observer. {{**Slide**}} This vision machine is the size of a five-story apartment block and weighs some 7000 tonnes. ATLAS generates 15 petabytes of information annually; this data enables the LHC research team to simulate, through immense amounts of information, the material of reality. As Sherry Turkle has observed, simulations such as this "offer an interactivity that makes screen objects seem 'material' to the point that contact with them feels like engagement with something quite real" (Turkle 2009). On July 4 2012 the CERN team announced that during the preceding months the LHC had successfully detected the Higgs Boson field and theoretically the Higgs Boson particle. {{**Slide**}} It had taken the CERN team many weeks to

sufficiently analyse the data to produce an image that articulated the "proof" of its existence. To the casual observer the simulation of a longstanding theoretical model and the visual interpretation of the data, which proves its existence, are barely distinguishable. The latter however is the image which proves the existence of a material that has always been theorised to exist and which substantiates a missing piece of evidence essential for the Standard Model of physics: "The Higgs boson is the visible manifestation of the Higgs field, rather like a wave at the surface of the sea" (CERN 2013). The image on the right is a data visualisation of the inner fabric of the universe and possibly one of the most significant scientific images of the C21st. Yet it is a composite visualisation of a large data set it is essentially a simulation that proves the reality. It is one of the most explicit expressions of not only the light on dark digital aesthetic but the authoring of certainty via machine vision.

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7. The Logic of the Swarm

As Bridle and Paglen have noted, the angel–like presence of unseen technology above and beyond the horizon is not designed to prevent the sky from falling but to make the fall more precise. The target is often foreign, distant and elusive. The targeting system directed by a very liquid data set that is constantly changing and evolving. Here the space of flows is governed most prominently by the convergence of Big Data and surveillance. {{**Slide**}} Drone technology and the R&D investment in the systems that govern their use is one of the most explicit demonstrations of the growing gap between data and individuals. The Snowden revelations confirmed that bulk data retention rather than selective analysis is the preferred method of security agencies like the NSA and the Australian Signals Directorate. As David Lyon observes, {{**Slide**}}

> This already goes beyond what many once imagined was direct and specifically targeted relationships by state agencies of individuals, to mass surveillance, dependent on a close liaison with corporate bodies and on the self-recording devices used in everyday communications and transactions. (Lyon 2014)

The danger is however that such a rationale will seep into other security operations and military programs that depend on data analytics and autonomous modes of operation. According to Maj. Gen. Curtis M. Bedke, the commander of the Air Force Research Laboratory (AFRL) the information space becomes the "battlespace". {{**Slide**}} It becomes an automated environment where

begrudgingly it would seem "humans would remain in the loop" in an almost subordinate monitoring capacity in a centralised ground station. While, out in the field, "brains with wings" become "more autonomous" their behaviour eerily echoing Jaron Lanier's notion of the network–hive mentality as they seek to maintain a "dominant offensive cyber engagement" (Ackerman and Bedke 2010).

This is the inverse of the Big Data dream, this Elon Musk's demons coming home to roost. Culturally it has already been foretold. {{**Slide**}} This nightmare scenario is evoked in a sequence of 'swarm films' that appeared in quick succession in the years immediately following 9/11. Each of the *swarm films* in one way or another is a parable of the potential dangers lurking within the apparent superior organisation of the hive. What we are seeing here, according to Adam Rothstein, is the emergence of the politics of cosmological capital as a present–future archetype: {{**Slide**}}

> Drones', as we have come to know them, represent an intensely collapsed political, economic, and social cosmology. They are singular points of world–historical militarism, state control, and technological specialty, orbiting high above our heads, the new astrological wanderers of our mortal fates. The MQ–1 Predator, MQ–4 Global Hawk, MQ–9 Reaper, RQ–170 Sentinel: these names are the basis of a new hierarchical choir of angels. (Rothstein 2012).

{{**Slide**}} In this regard, the drone, the clone, the automaton are part of a hierarchal system pre–ordained to aggregate data into "synthetic images created by the machine for the machine." (Virilio 1994)   We can see the iconography of this blending of science fiction and military iconography in the shape and form of computer hardware, in the cinema of aliens and the military components of surveillance. These cultural artefacts speak to the darkness within the gothic high–tech ferment. Although they may only appear on the periphery these artefacts embody an innate fear of the swarm – a mistrust of not only the foreignness of the machine but also a darker glimpse into human nature that they provide. The uncertainty and anxiety that ensues when we succumb to the pull of the pack, the mob, the horde is writ large in these cinematic parables of Big Data's end game. Could it be that our fear of the robot swarm is not based on a technological agent but the very primal instincts we fear exist deep within ourselves?

{{**Slide**}} Perhaps the first modern cinematic parable to wrestle with such questions was Ridley Scott's *Blade Runner* another seminal sci-fi classic from 1982. As we adopt the machine we adopt the possibility that we take on machine-like thinking and conversely the machine adopts human-like cunning and the ability to wilfully deceive. Here emotions are carved out by logic rather than feeling and the analogue touch becomes the algorithm of virtuality. {{**Slide**}} As Michael Newman writes, "The irony of the film is that the frame for simulation is not reality but simulation

itself: what we view in the cinema is already a totally simulated reality where the humans conform to stereotypes as much as the replicants, coded in the eclectic mixture of movie genres and period styles. Indeed, towards the end of the film the replicants come to elicit our sympathy, as victims who seem more vivid than the humans" (Newman, 1983). *Blade Runner* and the swarm films tell us not that we have been robbed of a new technological utopia but that the opposite is unknowable, that the actual catastrophe is the trauma of not knowing one's self.

And here is the rub. The neo–gothic narrative being played out in *Blade Runner* is not only the obvious novum governing all of the swarm films (that the A.I. has developed an unnerving mistrust of their human counterparts) but that we humans have developed a disconcerting lack of faith in ourselves at the hands of the machine. {{**Slide**}} Indeed, as was revealed in a 2013 article in GQ magazine by Matthew Power the trauma of remote controlled conflict, specifically of drone pilots developing "the same levels of depression, anxiety, PTSD, alcohol abuse, and suicidal ideation as traditional combat aircrews", represents an entirely new machine mediated anxiety. While the symptoms are analogous with what clinical psychiatrist Jonathan Shay calls "moral injury" this demonstrates a discernible shift away from a focus "on the violence that has been done to a person in wartime toward his feelings about what he has done to others" (Power 2013). And this is happening one step removed from the act itself as drone operators are increasingly relying on "Big-Data-led beliefs that suspects can be isolated by category and algorithm." (Lyon 2014) {{**Slide**}} In this reality kill lists are determined not by Generals but from aggregated data, missiles are guided not by joysticks but by the A.I. of unmanned aerial vehicles and operations are conducted not in cockpits but in virtual chambers at remote distances. The Department of Defense has acknowledged that a problem exists by identifying what they call the effects of "existential conflict". According to Dan Gettinger from the Centre for the Study of the Drone at Bard College to remedy this they will be investing in the Ground Control Station, the human component of the operation, with new "high definition monitors, ergonomic improvements, improved human-machine interfaces, open systems architecture, and improved crew habitability". (Gettinger 2015) In essence, a comfort upgrade. Yet most disturbingly however, is the department's plan to provide a procedural buffer – a moral sidestep – for the human asset to defer to a machine counterpart. {{**Slide**}} As Power's article reveals, "to mitigate these effects, researchers have proposed creating a Siri-like user interface, a virtual co-pilot that anthropomorphizes the drone and lets crews shunt off the blame for whatever happens." (Power 2013) This then would be the beginning of a systematic transferal of faith from the individual to the machine. The reality then becomes the simulation and we experience the very real blowback of the interface between Big Data, surveillance and A.I. on the individual. Discussing Walter Benjamin, Fredric Jameson observes how,

> … modern society, perhaps on account of the increasing number of shocks of all kinds to which the organism is now subjected, these defence mechanisms are no longer personal ones: {{**Slide**}} a whole series of mechanical substitutes intervenes between consciousness and its objects, shielding us perhaps, yet at the same time depriving us of any way of assimilating what happens to us or transforming our sensations into any genuinely personal experience. (Jameson 1971)

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8. The Morality of Datafication

To look and not to know: to design, build and then to ultimately secede to the technology is of course Frankenstein's curse. To construct in our image a vengeful enforcer capable of very human notions of control and of justice {{**Slide**}} – is this not the role of _The Terminator_ (Cameron 1984) {{**Slide**}} and of the _Robocop_ (Verhoeven 1987)? Are these wide screen imaginings of science fiction now fast becoming the ultimate algorithmic object – the robotic cyborg warrior? {{**Slide**}} Each of these films presents a very dystopian view of our present-future world, a place damaged by peculiarly human failings and broken political systems recasting society in the shape of Big Data. This is a place in which the cyborg from the future (and the past, as it were) is required to mete out justice and save the humans from themselves based on the hive-like logic of a corporate data set.

Beyond the advent of Siri-like comfort-pilots shouldering the burden of remote death there is evidence that the aforementioned 1980s fantasies of ground based warrior cyborgs have contemporary real world templates that bare the insignia of the electric blue ambience. {{**Slide**}} DARPA inspired projects include the Boston Dynamics ATLAS (Agile Anthropomorphic) humanoid robot and NASA's Valkyrie Val robonaut both of which feature prominent electric blue central processors in their chests. {{**Slide**}} While the new Rockwell Collins helmet for the F-35 Joint Strike Fighter enables "pilots to 'look through' the airframe" sporting a not so subtle ambient blue orb in the front of the bespoke AUS$770,000 helmet. (Martin 2015)

In many ways this integration of science and fiction by Department of Defense and its civilian contractors demonstrates a very obvious – and very violent – pathway towards a potential melding of human and device. This convergence of the "orga" and the "mecha" is guided by the development of autonomous systems and advanced A.I. which in turn are based on machine learning capabilities derived from mass data sets. These are the new machines – the new lead characters – in the collaborative hive of liquid ambience.

{{**Slide**}} In this idealised narrative of technological suprematism the U.S. Air Force Research Laboratory envisions swarms of military drones that are, quote: "guided by autonomous programming that allows them to change their objective mid–mission like a flock of birds suddenly changing direction" (Ackerman & Bedke, 2010). This goes beyond a mere reshaping of the systems of control, this is not purely an act of data analysis or security surveillance by an autonomous system, *this* is the system literally assuming control of and responding to data. And what if the effects–based targeting for the drone becomes an internal inward looking doctrine? Surely the paranoia that authored the circumstances that made drone strikes possible – and by extension the more extreme science fiction cousins in the swarm films – must have conceived of a domestic battle space? As artist Joseph DeLappe observes, drones "seem to perfectly combine aspects of our worst fantasies of digital technologies, interactivity, computer gaming and war. One might consider them a bit of a "gateway" weapon". (Garrett and DeLappe 2014).

{{**Slide**}} The US Federal Aviation Administration has predicted that there could be 10,000 commercial Unmanned Aerial Vehicle systems operational in US skies by 2017. (Federal Aviation Administration 2012) Meanwhile US military spending on UAVs is expected to grow from US\$5 billion in 2013 to US\$15billion by 2020. (Keller 2014)

With these figures in mind, as the industry is experiencing exponential growth and investment, should we be concerned that human discretion is being supplemented data analytics as semi-autonomous systems move towards autonomous swarm capabilities? As David Lyon observed, "Big Data practices encourage the use of automated decision-making and thus downplay the role of discretion" (Lyon 2014). Danielle Citron, Professor of Law at the University of Maryland, has warned that when automation privileges A.I. over human analysis society is making a "retreat from the discretionary model of administrative law" (Citron in Lyon 2014).

This "datafication" of targets, scenarios, timelines and battlespaces is creating a new set of evocative digital objects. In this brave new world of liquid data autonomous machines and the algorithms which guide them can independently evaluate and identify targets based on iterations – emergent patterns – enabling organisations like the NSA to visualise a threat embedded in an ever expanding database of threats that are constantly moving and morphing like liquid.

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Epilogue

Liquid ambience and the technocultural narrative that underpins it has become an intricate totalising tale of confluence: the medium, the message, the meme and now the atmosphere. In this space of flows sight has become mechanised, space militarised – time meaning and relativity collapsed into a digital simulation. Nation states dissolve into wikis, faith into terror cells, race into genetic code, humanity repackaged as a distributable sequence of digital objects. The speed of this transformation – the acceleration of the global contraction and the fatalism of its digital authorship – inhibits our conceptualisation of data and our identity within that data. {{**Slide**}} It becomes dark – blank – a dead pixel evocative of an Antony Gormley sculpture hulking in a pristine white auditorium {{**Slide**}} or the motionless barrel chested avatars staring down the incoming tide {{**Slide**}} or the open wound of the black granite voids of Ground Zero themselves an accumulation of data, of history and of impermanence.

The close out of the 20th century became a data space, a presence. Science fiction author Kim Stanley-Robinson's observation of technology's increasing omnipresence is also pertinent here, as it would appear that we certainly do "live in a world so intensely structured by science and technology that we can't get out of it" (Robinson 2009). {{**Slide**}} And while the techno–futurist's dominant narrative is of order and logic – like corporate branding, like a World's Fair, like a software interface, like an iPod – there also exists an underlying sense of chaos and uncertainty and of what Stanley-Robinson regards as the "anticipated strangeness" of things.

And nothing is perhaps more strange than the loss of identity and the rapid erosion of personal privacy at the hands of corporations and government in the name of Big Data and national security. Sure, we live in exceptional times but haven't we always? The misguided zeal of the Futurists would attest to that, triumphantly exalting Europe's descent into WWI. And certainly the benefits in Big Data innovation touch us all {{**Slide**}} – real time data acquisition and analysis, the integration of complimentary data sets, the social analytics of private and corporate meta data, the ethical sharing of information, the open data movements in some federal and local governments particularly in the UK, the maintenance of thorough and correct archives of personal and historical information, and the ambitions of researchers to provide open access to their research findings are critically important initiatives. Each of these have enormous humanistic value that far outweigh the deception and exploitation that have so troubled these first awkward clunky years of data decadence. {{**Slide**}}

And so, we find ourselves at a crossroads. We can take some comfort in the knowledge that those who toil away at the edges of network culture's regulatory and structural framework are making some headway. The recent win for net neutrality is a fine example of this. For it is naïve to believe that decades of top-down economic and political rationalism may one day magically change

tact and initiate their own programs of reform. As the we really have the luxury of time to wait this one out? How long until these extraordinary prevailing sets of circumstances become the norm? As Edward Snowden has repeatedly asked, "What kind of society do we want?"

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