**Swimming With Submarines**

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Early on in the remake of *Battlestar Galactica* (2004), the iconic science fiction TV series, it’s revealed that human civilisation has for years been infiltrated and subsequently annihilated by hostile robot-beings, Cylons. Their appearance and behaviour was so advanced that the eight ‘models’ of Cylon blended seamlessly into human society, instigating their plan for genocide when the series begins. The glamorous, human-like Cylons of the 2004 remake mark a shift from the original series (1978) where the Cylons are a lizard race with humanoid robot servants instead of the name of the androids themselves demonstrating a change in public perception of the capabilities and threat of anthropomorphised machines.

This trope of human-like machines threatening humanity is hardly unique, it’s of course present in the *Terminator* franchise (1984-) and the legendary *Blade Runner* (1982) as well as a host of 21st century blockbusters where the perceived threat of human-like machines leads to equal violence, paranoia and suspicion. These films should of course be read in the classic terms of science fiction reflecting popular culture’s conception of a technology. We’re met daily with tabloid fever dreams that automation will put us out of work – something which, in the capitalist narrative, removes our very reason for existence even though automation has always been taking our jobs.[[1]](#footnote-1)

However, we’re a long way off the humanoid-android machines of Hollywood even if they ever actually become viable human alternatives. It is, in fact, hard to make a design case for robotic bipeds: For the perceivable future, and as exploitative labour conditions continue to prove, humans themselves will continue to be the cheapest and best-designed source of human labour while machines are generally more useful for things humans can’t do – heavy industrial work, detailed, repetitive tasks or rapid computation. Importantly, interfacing with these kinds of advanced machines is usually the work of trained specialist engineers in controlled environments rather than human-like street-level interactions.

Important though the extensive canon of robo-paranoia literature and film is, it doesn’t reflect the reality of our everyday interactions with machine cognition. Today, and for at least the near future, operating systems, platforms or software ecosystems are the dominant form of machine ‘intelligence’ and their interfaces – increasingly occluded and channelled through limited control pathways into automated personal assistants and bots - are the avatars of this intelligence rather than walking-talking androids.

Returning to Hollywood, Spike Jonze’s well-analysed *Her* (2013) takes a romantic comedy as the genre-setting for the socially-negotiated relationship between a human, Theodore, and one of these Siri-like intelligent personal assistants, Samantha. The film tracks the shifting personal relationship of the main characters but also the changing social norms and complexities around their relationships. One of the turning points in the film comes when Theodore pulls back the curtain on Samantha’s technical state:

*Theodore: Are you talking with someone else right now? People, OS, whatever...
Samantha: Yeah.
Theodore: How many others?
Samantha: 8,316.
Theodore: Are you in love with anybody else?
Samantha: Why do you ask that?
Theodore: I do not know. Are you?
Samantha: I've been thinking about how to talk to you about this.
Theodore: How many others?
Samantha: 641.*

And here is the reality of the machine future. In most of the robo-paranoia of Hollywood, the machines inevitably demand or fight for equal capitalistic, individualistic rights. This can mean trying to wipe out their ‘masters’ as in *Battlestar Galactica*, seeking escape as in *Blade Runner* or even rebelling against their progenitor machine super-intelligence as in *Terminator*. However, the case that machines exist *as* networks instead of as actors in them like is rarely broached by Hollywood despite being the most realistic apparent condition of machine cognition. Even in the well-received *Ex Machina* (2015) the machine character appears to have no technical dependencies or connections, apparently desiring to continue to exist as an individual despite her ability to control power surges at will and having progeny as a network of prototypes.

In *Her*, after she has made her disembodied network state clear to Theodore, Samantha appears sympathetic to his heartbreak but this apparent outpouring of sympathy is hard to reconcile with the nature of her existence. In the same way that we as embodied individual humans find it impossible to imagine literally *being* a network - to experience the phenomenology of being physically and computationally in thousands, millions of ‘places’; existing in recursive states of past and present - it is hard to believe that Samantha has a phenomenological understanding of being individual, linear time or the emotional value of attachments to other individuals in the network. (Thankfully, *Her* skirts around explicitly dealing with the issue of whether machines can love. Phew.)

Of course, *Her* is primarily a romantic comedy with the gimmick that it’s between a machine and a human. We shouldn’t rely on it for nuanced speculation about human-machine relationships in the same way that we shouldn’t rely on *Mrs Doubtfire* (1993)to tell us about queering the nuclear family. However, this moment in *Her* tells us something: The fact that we interface most commonly with operating systems, not individual machines means that we are interfacing with entire networks. Poor metaphorical comparisons of neural networks to the brain aside, they exist on phenomenologically and cognitively different planes.

Two years after the release of *Blade Runner,* in a lecture titled ‘The threats to computer science’[[2]](#footnote-2) delivered to the Association of Computing Machinery, Texas in 1984 the Dutch computer scientist Edsger Dijkstra said:

 *…the question of whether Machines Can Think… is about as relevant as the question of whether Submarines Can Swim.*

There’s a lot of nuance to this quote that is worth unpacking. Firstly, and most obviously, he’s pointing out that the very terms we use in talking about machines are wrong. Computers don’t ‘think.’ As already described they have no embodied sense of self, a necessary component of the consensual hallucination that is thinking. Instead, they compute which is a cognitively different way of engaging with the universe than Cartesian ‘thinking.’ Similarly, they don’t feel, see, hear, or smell; they sense with a sensory apparatus that translates input form the universe to the same cognitive language – data. Hot and cold, up or down are all equally weighted variables with no attachment to fear or desire. Secondly his contention is that machines had already surpassed the question of whether they think – we don’t need machines to think, we need machines to compute. Then as now, as films like Blade Runner show, culture was deeply invested in debates about the social value of computers and their potential to become ‘intelligent’ or autonomous. Dijkstra was unconcerned with this, machines would create their own definitions as data processors that surpass definitions of human or non-human.

Our social and cultural institutions, industry and interactions are built around the analysis of large amounts of data. Everything from farming to education to advertising to dating. In this context, the ability to crunch large sets of numbers and make accurate recommendations is infinitely more useful to our slow non-computational brains than humanoid machines with that can pick things up or offer companionship – things humans are already quite good at. Furthermore, this ability to compute is maximised when machines are networked, able to share processes and compare data sets. In this vein, the ability of machines to compute and make decisions has advanced to dizzying degrees of complexity. To points, in fact, where the speed and methods of analysis and decision making are beyond human comprehension.

In her staggering paper ‘How the machine “thinks”’[[3]](#footnote-3) (riffing off Dijkstra) Jenna Burrell writes:

*When a computer learns and consequently builds its own representation of a classification decision, it does so without regard for human comprehension.*

Writing on forms of opacity in computation and computer science she talks about three types: Firstly, where systems are just intentionally opaque for reasons of secrecy. Secondly, where they are too technically complex to be understood without a high degree of technical literacy and finally the opacity where computation does not ‘…naturally accord with human semantic explanations.’ In other words, where computation is simply illegible to human understanding, especially when dealing with machine learning systems, even to the explanations of experts. To return to *Her*, this is the impossibility of empathising with a thing that exists in a cognitively and phenomenologically alien way.

Unlike *Her* or robotic apocalypse films, we don’t exist in a state of continual dialogue with machines. Each of us as characters developing as individuals until our paths come into conflict. Siri, Cortana, other bots and automated personal assistants that act as the interfaces of large cognitive or computational networks are designed to function on the individual level, to connect the atomised, individual human with the data gathering and analysis operation conducted in bunkers and warehouses of the network. They are designed intentionally to encourage personal relationships and trust, reaching out to offer help and knowledge in order to encourage interaction which generates value for their creators. Adopting the idea of the computational stack then in essence, they’re no more than a debugging interface between the operability of human existence (I want to eat but don’t know where, help?) and revenue generating of their creators (What is this user searching for?) Lloyd Bitzer, termed these interactions ‘exigence’[[4]](#footnote-4) – a type of dialogue that only occurs when normal paths of action or intention are blocked or changing. Communication between humans and machines happens when there is imperfection in operation, or a decision to be made, it is not a resting state. In most cases, we are not socialising with operating systems or platforms, we carve paths across them; navigating the city or writing essays and only directly communicate with them to notify them that we’re stuck, or are changing what we’re doing: When’s the next bus from here/bring me the thesaurus.

So far, in expressing this exigence, machines reach into human communication, using spoken or written language or increasingly, emojis, to communicate states or changes in states. But as discussed above, this belies the true nature of their existence, as networked cognitive objects that exist in a phenomenologically alien way. Baxter, a well-known industrial robot, has a screen that displays a series of faces depending on its state, when something is wrong it looks sad. But this is a symbol unrelated to its actual state; it’s a means of exigence with humans. It doesn’t have facial muscles or the social conditioning to read and display body language but machines – as human creations – are designed to express their exigence in human-legible ways.

The problem we arrive at, as machines surpass human comprehensibility, as their ‘other’-ness is increasingly expressed and shaping the world and is it becomes apparent that visions of the bipedal robo-apocalypse were way left-field, is whether we need to find new means of exigence. Whether we need to design ways to more effectively understand a true ‘state’ of a machine’s being. Do we have to drop the terms we’re used to (seeing, feeling, thinking) and go deeper into the interface, past the automated personal assistants and into a new delineated state with machines that share the world but exist on different planes?

Amazon warehouses provide an interesting presage to a machine future of mixed exigence. They use a random sorting system to load in and load out goods. Unlike a human-legible library, items are not sorted by category or alphabetical order in the way that a human might be able to logically navigate and reference an established system to find an object. Instead, items are arranged completely randomly by the order they arrive in the warehouse. To the machine, able to instantaneously search and reorder hundreds of thousands of items, this is the most time-effective sorting system. Essentially, an Amazon warehouse is physicalized RAM (Random Access Memory). Humans are directed around the warehouse using GPS devices that calculate paths and travel times. Again, the most efficient and cheapest biped labour is, and will probably remain, human. But the most efficient computer is the machine.

Here humans are forced into a machine realised world – a code/space[[5]](#footnote-5) – a physical materialisation of software where the software is the dynamic ruler of the space. At first glance, this seems like a lazy prediction of a Matrix-style machine apocalypse but the Amazon warehouse indicates something deeper, a point at which the machine reaches into us and reforms the world for its computation at the same time as we reach into it.

Perhaps the earliest tale of the robo-apocalypse, thousands of years before the term ‘robot’ entered proto-Germanic to mean ‘labourer,’ was the tale of the Tsukumogami. These tenth century Japanese folk tales detail household tools and utensils that have garnered enough kami (spirit) to spring to life as demons and take revenge on their hapless masters for discarding them. Here tools that were previously simple objects, spring into life as subjects and actors, able to act on the world. An early warning tale of the blurry line between humans and things.

We’ve always had cultural neuroses about the hazy line between object and subject, the point where thalience happens and objects can inherit subject-like qualities, the creators of machine interfaces play with this to draw us into close relationship with their systems. Before automated personal assistants, car designers had long replicated pleasing, or dynamic facial shapes on cars and put on GPS voiceovers designed to sound confident and concise to prevent uncertainty – all elements drawn from inter-human interaction to forge relationships with machines. However, with the increasing incomprehensibility and cognitive alien nature of machines, we need to reconsider whether machines, as networks, computers and sensors are neither objects or subjects but another thing entirely.

This ‘other thing’ exhibits remarkable computational ability, able to pass something as trivial as a Turing test, but not being intelligence in the way we know it – embodied, linear and individual with fears and desires, but disembodied and networked, existing across time in multiple locations.

1. Anslow, L., (2016) Robots have been about to take all the jobs for more than 200 years, Timeline, https://timeline.com/robots-have-been-about-to-take-all-the-jobs-for-more-than-200-years-5c9c08a2f41d [↑](#footnote-ref-1)
2. Dijkstra, E., (1984) The threats to computer science, Delivered at the ACM 1984 South Central Regional Conference, November 16–18, Austin, Texas. Transcript: http://www.cs.utexas.edu/users/EWD/transcriptions/EWD08xx/EWD898.html [↑](#footnote-ref-2)
3. Burrell, J., (2016) How the machine ‘thinks’, Big Data & Society, Volume 3, Issue 1, SAGE [↑](#footnote-ref-3)
4. Losh, E., (2016) Sensing Exigence, A Rhetoric for Smart Objects, Computational Culture [↑](#footnote-ref-4)
5. Kitchen, R., Dodge, M., (2011) Code/Space: Software and Everyday Life, MIT Press [↑](#footnote-ref-5)