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# Emergent Technologies and (Post-)Human Embodiment

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## 1. Introduction

Posthuman variations of embodiment are gaining traction by the day. The movement has started quite a few years ago with unusual tattoos, plastic surgeries and attempts to bio-hack ones' own body. Imaginations of cyborgs are much older such as the classic animation of the manga *Ghost in the Shell* (Japan 1995, Mamoru Oshii), or David Cronenberg's *eXistenZ* (Germany, 1999). They are to be found in early film history, like in Fritz Lang's *Metropolis* (Germany, 1927). Literature has imagined cyborgs and androids for much longer, just think of E.T.A. Hoffmann's short story *The Sandman* (1816), where he describes a humanoid automaton named Olimpia, with whom the main character falls in love with. The topic of humanoid machines or human-machine hybrids fascinates the human mind long before the dawn of digital technologies.

Imaginations of posthuman life-forms today come with a change of the environment. Current utopias imagine live either in virtual realities or in smart environments (Internet of Things, IOT). Cronenberg's movie *eXistenZ* for example takes us into a whirlwind of layered and entangled virtual realities. Imagine you connect yourself via a bio-port, that is plugged into your nervous system with a VR, in which you can play out your wildest phantasies. Your biological body goes unharmed even if you got killed in VR - just as humans in the series *Westworld* (USA 2016, based on a Michael Crichton novel from 1973). They cannot be killed by the androids, even if those shoot a gun at humans. Utopias of new forms of embodiment go hand in hand with forms of disembodiment that play with the idea of experiences in a biology-free space.

The combination of experience without biology is a conundrum. How did we come to consider virtual life as a playground for enhanced experiences - experiences that have bodily consequences like the production of endorphins, increased heart rate and so on? Do we really think, our uploaded brain would enjoy chocolate cake as much as we do, even knowing that it will increase our body fat and the danger of a heart attack? Forbidden fruits are the sweetest or so they say. The sweetness of pleasures depends on cultural ideas and our bodily responses. The idea of an uploaded brain lacks at least one of them: the body. Still disembodied minds indulging in forbidden pleasures seems an

evergreen topic in science fiction as well as in the minds of creators of cutting edge technologies. Let me dig a bit deeper into the history of bodies and machines.

I am interested in the variations of embodied and disembodied forms of existence in science fiction. In the following I want to argue that science fiction movies can serve as a starting point for a phenomenology of future bodies content-wise and as a meditation on how we think and imagine future life. I take this to be an important topic because the ideas of VR, mind-upload and the dawn of a singularity are fueling our public debate even if the last two points are far from technological realizability. My hypothesis is that the danger machines represent to human life is not their growing intelligence but *how* we use them to govern social life.

## 2. Of Humans and Machines

Utopias of post- or transhuman life are rarely full-fledged positive scenarios. Though there are people in the industry, especially futurists who toy with the idea of mind-upload as a strategy to a fulfilling and sustainable future life. Most utopias or activities with utopian aspects though have something disturbing or uncanny about them. Just think of *Stelarc's* performances. In his work, he meditates on human-machine interactions that play out directly on or in his own body (e.g. *re-wired/re-mixed: event for dismembered body* (2015), *Stickman* (2017)). This mostly painful form of being hooked to machines also gives the spectator the impression of watching something uncanny going on. The artist sometimes seems to turn into an automaton or even a zombie, because his movements are governed not by himself, but a machine or even by other players that control the movements of his exoskeletons or the devices he is connected to. This experimentation in embodying technology vividly shows that there is a lot of biology and materiality involved in current human-machine systems. These attempts can be understood rather in terms of disownment of bodily functions than of disembodiment in the strict sense. The body gets integrated within an ensemble of technological devices, that have not been integrated into the body scheme as it is the case with glasses or the infamous blind man's cane. The fact that technological artifacts become integrated parts of our body schemes is crucial not only for current developments in body-invasive technology and wearable industry. It has shaped already the usage of tools in the beginning of human history.

## 3. Historical Aspects of Human-Machine Relations

The first objects of clearly technological character were tools. Archeology as of now holds that the usage of tools dates back around 3.3 million years. The word *tool* was only used around 1200 A.C. What is true of tools in the stone age and now is that they have a special relation to the human body. They are shaped in a way that they correspond to the form and movement of the body. The skillful user integrates the tool into his or her body-schema. Hence, the tool becomes a part of

the body that broadens the sphere of agency of the user. This has been the predominant human-machine relation for the longest part of human history. Gilbert Simondon takes this to be one crucial reason for the alienation that seems to emanate from technology since 1900. In his work *Du mode d'existence des objets techniques* (Aubier 19893), first published in French in 1958 he holds that Karl Marx's idea that alienation of the workers' relation from the means of production is not only a question of socio-economic changes. Simondon describes a crisis of the human-machine relationship. The type of technicity in his view fundamentally changed with the rise of industrial production, which led to an alienation of humans from the means of production (Marx) and their bodily engagement with the means of production. A form of distance created the concept of the users that is to be differentiated from that of the craftsman. The users concentrate on the ends, to which technology provides a means to reach them. In that relation, knowledge of inner mechanisms of the devices becomes irrelevant and the imagination of a fully automated technology as utopia enters the scene. Though I do not believe that knowledge of the inner workings of machines is or has ever been a decisive criterion for the human-machine relation, the idea of automation is important with regard to utopias.

This crisis of the human-machine relation is rooted in a psychophysiological change: The machines in the industrial age are not integrated in the body scheme of the worker as tools were before. The worker becomes a user or an engineer, who organizes the machine, rather than bodily being engaged with it. Simondon thus recognizes the reason for this alienation within the realm of the culture of technicity. In his view, it is not only humans that lose existential connection with the technical objects but also vice versa. Technical objects also become increasingly concrete or individuated in order to achieve the optimal functioning. Also for the machines Simondon argues that the idea of the perfect automaton that can work toward a certain end with unwavering precision is an alienation of technicity. The technical objects as well as their users become subsumed under the same capitalist logic or utopia of ever increasing efficiency according to Simondon, that leaves not much room for further development.

Current developments in many sectors of industry and trade work frantically toward a "culture change", which embellishes the idea of complete automation of central work processes. Automated systems are generally thought of not only as replacing various forms of human labor, they are also predominantly invisible. We are talking of intelligent algorithms that organize supply chains, facilitate contracting, insurance processes and bureaucracy. Those systems become a new form of invisible hand. Whether it will have positive effects or not has to remain open.

If Simondon is right, then we have found at least one reason for the ambivalence of current projections of future life, where bodies become superfluous while bodily experiences seem to have a renaissance in a not overall positive way. Immersing oneself in a VR though is an entirely embodied experience since we experience our bodies in new ways while engaging in this activity. It is only the physics of the environment that is abandoned to some extent. The VR shark won't eat the user. Still most of Science Fiction scenarios give their plots another twist. The body re-emerges

within virtuality. This might be a symptom of an underlying fear of losing the body or bodily contact within the life-world. After all it is bodily experience that reassures us of the reality of our experiences. This way of being embedded and entangled within the perceptual realm is not easily abandoned and will continue to function in augmented, virtual or hybrid environments. That is one reason why science fiction seems to be haunted by embodied minds.

When Simondon argues that machines do not broaden the human body scheme or stand in a vital relation with it as tools do, then this goes for the huge techno-ensembles like factories as well as early information technology. On the other hand, he argues that modern day technologies are not simply objects but ensembles that are intimately related with their environment and thus also with humans inhabiting and working in these environments. On a deeper level Simondon also invokes structural couplings of humans and machines in the sense that data procession and biological memory complement each other in information technology: “There is an inter-individual coupling between man and machine, when the very functions of self-regulation are accomplished better and more subtly by the man-machine couple than by man or the machine alone.” (Simondon 1989, 120, my translation) Simondon explains this by the way people use data storing technologies to enhance their memory. Humans lack the capacity to keep huge amounts of information present in their minds, while machines lack the ability to integrate the data stored into meaningful sets of information. Thus, the human- machine interplay makes the best out of both worlds. This is where wearable technologies, the IoT as well as body-invasive technologies are headed too. It is still open, whether those designs will complement human cognition or just streamline it. One thing is for sure, the relation of human bodies and technology has by no means become more distant. Rather it is closer than ever. The question now is: Will technology be a prolongation of the body or vice versa?

At this point it already becomes clear that the distinction between human biology and technological artificiality becomes blurred or has little explanatory power. Human memory certainly has its biological underpinning and limits, but the way we memorize and what we memorize is deeply influenced by the use of technology. The way people used to memorize phone numbers before phones memorized numbers themselves is about to be a forgotten skill. Not only because the devices do that for us. Also, we don't dial number by number anymore. The knowledge of phone numbers in earlier times was literally in your fingertips just as your feet know, where the pedals are in the car are, or the right order of steps to tango.

This is what Maurice Merleau-Ponty (*Phenomenology of Perception* (PP), Routledge 2014) calls body memory or embodied knowledge. Huge amounts of knowledge are not propositional in the sense that you could bring it to the fore by uttering sentences in logical correct order. Most parts of knowledge and memory have to be triggered by psychophysiological relations of bodies and their environment. This not only holds for sensory-motor-skills but also for other kinds of memory. Merleau-Ponty writes: “I relate to the word just as my hand reaches for the place on my body being stung.” (PP 2014, 186 [220]) The lived body plays a constitutive role in the constitution of meaning and integration of knowledge. This intimate relation of body and memory also includes media

and technological devices in general. The body is not confined to its outer skin but always reaches into the environment through extensions like tools, media and technological devices of all sorts. Basically, everything in our proximity can become integrated in skillful motor-sensory behavior (Alva Noë, Andy Clark). With micro-technologies and wearables this ecology complexifies and we need a phenomenological account of what this means for human embeddedness and the qualitative changes within our life-worlds.

#### 4. Human-Machine (De-)Coupling

One obvious characteristics of our time and the near future is the disappearing of technology. Heavy hardware is rare in everyday surroundings. The huge personal computers will soon be a thing of the past. The IoT will hide intelligent and highly connected devices underneath the surface of ordinary things such as fridges, tabletops, wristbands, and even jewelry. Micro- seized technology will more and more penetrate our bodies, such as microchips. While technology seemingly disappears, it gets even closer to our bodies. It is not uncommon to regularly wear *Fitbits* or smartwatches. Pacemakers or neural implants that prevent epileptic seizures are common for a long time already. All of those devices the promise in common to make life easier, the user experience smoother and our life healthier.

These small (or even microscopic) devices and algorithms operate invisibly and might be one of the reasons why our imaginations and anxieties concerning technological developments run wild. When Elon Musk warns of the potentially deadly threat from AI one should be suspicious. Also Ray Kurzweil, who promoted the concept of the technological singularity thinks of humans as disappearing - either developing into a higher technological life-form or being outdated. Talk of humans being left behind or evolving into a whole different life-form is ubiquitous. Apart from those largely polemic discourse one could take a more phenomenological perspective on the changes in our life-worlds today.

The fears of being outrun by technology or governed by an evil big data system might be unwarranted. The development of specific technologies though can and probably will turn into a cultural crisis just like Marx's and Simondon's ideas of alienation from the means of production in the 1900's. We are faced with technologies that are governed by algorithms and heavy data exchange. The vision of the IoT describes a life-worlds that relies heavily on sensors and connectivity. That means, objects will have eyes and ears that are constantly awake. The IoT is the house that never sleeps. The fact that data collection processes, which constitute the usability of our current devices and the way interaction with them is shaped by mainly predictive algorithms has given rise to theories on the constitution of human mind through technology, namely Katherine Hayles concept of *technogenesis* (*How we think, Digital Media and Contemporary Technogenesis*, University of Chicago Press 2012) or Bernard Stiegler's *epiphylogenesis* (*Technics and Time, 1: The Fault of Epimetheus*, Stanford University Press 1998). That means technological processes inscribe

themselves into human cognition on a pre-conscious level. This is no news. Human cognition has always been shaped by contact rather than inherent genetics. But where do the dystopic fantasies arise? Futurism in technology is all about getting rid of obstacles, smooth user experiences and a better life that might ultimately leave behind the biology of our decaying bodies and finite minds. So far so good. Or not.

Movies tend to tell different stories. They are dystopian images of unjust, divided societies or other social threats. They share one pictorial logic with current futurism in technology. This is the disappearance of hardware. Most of science-fiction today envisages worlds with either outdated or no hardware at all. Instead, the body returns in sometimes violent ways. Let me end with an example: Cronenbergs *eXistenZ*.

*eXistenZ* is one of the early movies that imagine VR and their relation to the body. Around that time, a number of movies came out that still keep occupying the philosopher's mind like *Matrix* (1999), *Minority Report* (2002) or *Ghost in the Shell* (1995). While the first two movies resurrect the human body, *Ghost in the Shell* overcomes it. *eXistenZ* is somewhere in the middle. The movie is about a VR game, in which there are so many levels that nobody knows what is real or fiction. It clearly transcends the categories of reality and virtuality (as the end of the movie shows). Neither the viewer nor the protagonists get a hold of what is real. In this deep entanglement of worlds there is one salient characteristic: It is biology. Everything is as messy as it gets. Even weapons are made of flesh and bones, game-pods are fetus-like creatures, human-machine interfaces are bio-ports, holes in the lower part of one's back with a clear sexual connotation. The claustrophobic character of the movie is constituted by the messy organic, mutated life as well as the idea that there is still a reality in which the gamers' body lies dormant and vulnerable. The protagonist says: "I feel really vulnerable, disembodied." Though VR games suggest that your actual body is safe even if your avatar explodes, it only works if there is a clear consciousness of virtuality. If immersion goes as deep as to make one forget that it is a game-world, threats will become real for our embodied perception: bodily reactions will be the same as if faced with real threats.

René Descartes' dream argument comes to mind here. He holds that we have no real means to tell whether we are awake or immersed in a dreamscape. With VR this fundamental doubt concerning the veracity of our perceptions becomes a real issue. Even if we are already quite used to live an *on-life*, as Luciano Floridi puts it (*The Onlife Manifesto: Being Human in a Hyperconnected Era*, Springer 2014). Onlife, that means we are always somehow engaged in virtual and real spaces at the same time. But apart from that we still live by the idea that our bodily engagement warrants our beliefs about the world.

This might not be that case in a complete immersion that VR glasses today cannot give. If biological interfaces become reality, this can be possible. Then our nervous systems will become detached from bodily situatedness. Body and mind could find themselves in two different realities. We will be here and there at the same time, just like a quantum object. The movie plays out in depths how such an immersion upsets human categories and logic, because there is no possibility

to discern the status of the perceived world as either real or virtual. Maybe with a growing engagement in hybrid life-worlds we might learn how to accept such a body- mind splitting. For now, such narratives are symptomatic of a deeper attachment to our bodies than we might be aware of. Even if it is tempting to get rid of finite bodies and the threat of death, our imaginations show an even deeper fear of being trapped in virtuality.

As far as I can see, none of the science fiction movies in the last twenty years have a positive notion of disembodied life. Every narration is haunted by reverse embodiment. This calls for a phenomenological reflection on tendencies of disembodiment or rather an account of the functionality or obsolescence of the body also in current stages like IoT or hybrid environments. The dystopian images in science fiction seem to be symptomatic for a crisis of human embodiment in analogy to what Simondon described for the alienation of humans and their means of production in the industrial revolution. Understanding human embeddedness in hybrid or virtual realities might prove as important as a reflection on the changes in labor and concepts of human work, because all of these shifts in the make-up of our life-world bring about qualitative shifts in perception as well as in values and ethical norms.