Artificial Intelligence
Invisible Agencies in the Folds of Technological Cultures

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1. Introduction

Democracy is all about transparency, visibility, and public engagement. In the Greek polis, political decisions were discussed in the *agora*, a public place where all citizens (in that case only free men older than 30) could listen and engage. Representational democracy today is less public, but transparency of decision processes is of the utmost importance. If a government cannot make its decisions transparent enough, it runs the risk of losing the people's trust. Transparency in a political sense implies rules, visibility, and the readiness to argue and give reasons. With the emergence of AI applications not only in the political sphere but in basically every aspect of social and private life, we are faced with new forms of opacity and nonconscious cognition, which strongly impact human decision making, behavior, movement, and communication. The central problem is that AI applications act without being able to give an account of the underlying reasons and even the underlying causal processes remain opaque (black box). If an AI used for analyzing credit rating denies credit, this decision can ruin a private life. If then reasons are not given or possibilities explained, this alone might shake people's trust in civil society. Agency based in nonconscious cognition is becoming a ubiquitous phenomenon and thus calls for ethical and phenomenological reflection. In this essay, I aim at understanding the way in which AI is experienced in terms of visibility and transparency. Toward this end I will combine phenomenological considerations with Martin Heidegger's reflections on the nature of technology.

One of the features that elicits speculation about artificial intelligence at stake here is the fact that at least for the user it is nearly impossible to understand how AI arrives at its outputs. AI applications are often characterized as black boxes (cf. Sudmann 2018a). Even if the math behind self-learning algorithms is quite straightforward, the causal processes leading from input to output are not really transparent (cf. Sudmann 2018b: 63). Obscurity is usually conceived of as a threat and potential danger. This leads to the central question of this article: Should AI

be regarded as a threat to democracy because of its invisibility? As I will argue, this is true at the surface, but I will also show that technology always comes with a certain form of invisibility. The question is whether this reaches a new level with AI. In a first step, I will define what I mean by visibility/invisibility from a phenomenological perspective. I introduce this view because it relates perception, experience to technology. Then I will clarify how this applies to the relation of human and artificial intelligence. The last part of the paper discusses the issues of the disappearance of technology and the complex relation of transparency and opacity with regard to technology. My aim is to show how AI systems introduce a new kind of invisibility or opacity to the ecological structures of the life-world.

There are at least three different layers in the interplay of visibility and invisibility involved: One goes for every object of perception: Perception is perspectival and thus invisibility is a necessary part of it. Invisibility therefore is a constitutive part of every form of perception and cognition. In the case of technology, I follow Heidegger in the diagnosis that there is a higher order form of invisibility. This is the essence of technology, which is itself not technological, but a fundamental style of thinking or revealing. This analysis of technology has a parallel in the analysis of consciousness, which is in its constitution also opaque to the conscious subject. To this extent there is nothing groundbreaking or new in terms of technology. With AI a third layer of opacity enters the stage: This is nonconscious agency—an agency that cannot give reasons but shapes lives in a very profound way. Although nonconscious agency is present also in humans and animals, technological nonconscious agency is new because it essentially shapes social and political life now and in the future. The combination of these aspects of invisibility and opacity makes up for the widespread uneasiness with AI. My aim is to give an idea how the different forms of visibility, transparency, and opacity influence the potential of AI to endanger or enable democracy.

2. Conditions of Appearance: Visibility and Invisibility

In his essay, *The Question Concerning Technology*, Martin Heidegger describes technology as a way of revealing, of bringing the concealed into unconcealment (cf. 11f.). This view is more profound than the usual instrumental view of technology as a means to an end. The character of technological artifacts is not understood adequately according to Heidegger, if this is conceived of as a tool that simply helps humans achieve particular ends. Furthermore, Heidegger also claims that seeing technology as a human doing does not capture it fully. Both notions of technology as instrumental or anthropological are not wrong. They capture technology in terms of how it is usually experienced and used. Nevertheless, they do not get to the essence of what technology is. But what is the essence of something?

Is it the thingness of a thing, that through which a thing is a thing? Is it something that does not change, while other parts or aspects may do so? In fact, it is hard to specify conceptually what the essence of something actually means.

In Heidegger's writings, at least two notions of the concept are at stake: First, the ancient Greek notion *what* something is (Heidegger 1977: 4); and, second, that of "enduring as presence" (Heidegger 1961: 59). Both aspects are relevant in his essay. The quest to understand *what* technology is determines the whole text. Heidegger is convinced that the answer to this question will not point towards an entity that is of a technological character. The essence of technology is not itself technological (cf. Heidegger 1977: 4). That means that the essence of technology is not a thing; it itself is not a physical entity. Furthermore, he holds that the essence of technology is an activity: revealing or bringing something into *unconcealment*. His claim is that it is only as a basic process or activity that technology endures.

The current discussion around AI is characterized by a similar tension. On the one hand side, intelligent technologies are conceived of simple means to ends. Processes in automation, robotics or speech recognition, to name only a few, are AI-based. These complex tasks require the ability to learn. Self-learning programs seem uncanny from the outside, but maybe not so much from the inside. Creators of such AI's usually hold that there is not much intelligence hidden in the programs. Rather it is a technological agency that reaches quite a level of sophistication, but is far from being creative beyond the limits of its training. This task-oriented functional intelligence is to be sure continually evolving, but as of now only within certain limits and on the basis of the input the AI is trained with (cf. Pontin 2018).

Public discourse, on the other hand, is fueled by threatening scenarios of a singularity transcending human powers or, less futuristically put, threats of AI erasing jobs and manipulating human behavior (e.g., targeted personalized marketing). These issues arise from AI being generally opaque (ibid.), even if it is possible to develop applications to observe AI learning processes (Sudmann 2018a). Also, the envisioned ubiquity of AI applications elicits broad discussions of the consequences for labor cultures (AI for optimizing work processes and automation) and social environments (sensor-based observation systems).

These preoccupations are related to Heidegger's discussion of the essence of technology. What might be lying at the core of our preoccupations with AI is the fact that they are (or at least are envisaged) as *world-making* technologies. Technology according to Heidegger is not the sum of physical devices but above all a style of thinking and revealing entities. This aspect is made more and more explicit within the realm of future technologies.

When we take a closer look at Heidegger's words to describe the essence of technology, the relation to visibility and invisibility is undeniable. Describing the essence of technology as something that is itself not technological gestures toward

an invisibility. The transcendental conditions of technology are themselves not of a technological or objective character. Heidegger arrives at the idea that technology is essentially a way of *world-making*. The logic of *enframing* (*Gestell*) conceives of the world as *standing-reserve* (*Bestand*), i.e., a *constellation of resources that is at disposal at all times*. He finds this logic at work already long before modern technology even emerged. While history tends to view modern physics as the enabler of modern technology, Heidegger holds that the structure or logic of technology already governs the development of modern physics (ibid.: 22 f.). The reason he gives for this claim is that modern physics as such is based on the belief that the world must be observable, measurable, and rendered predictable (ibid.: 172). Predictability is necessary in order to treat the environment as *standing-reserve*. The interplay of needs and resources is a future- and hence prediction-based endeavor. Modern physics was already driven by the goal to tame the physical world through prediction and calculability, which is most explicit in the use of AI (e.g. for facial recognition used in border control or urban CCTV applications, and predictions of consumer behavior or optimizations of workflows through management AI). This means current usages of AI expand the potential to uncover *standing-reserves* beyond the exploitation of natural resources and thereby far into the depths of human behavior. The extent of this process is not yet clear, much less its consequences and ethical challenges.

When technology constitutes the intelligibility of the world that reveals it as *standing-reserve*, as being always at disposal for our use, it also at the same time hides or conceals something. The way technology (or rather its essence, the process of *enframing*) insidiously compels humans to conceive the world as intelligible generally in terms of technology is tainted by the logic of instrumental thinking, of means and ends. It thus hides the character of objects as what stands over against subjects: "Whatever stands by in the sense of standing-reserve no longer stands over and against us as object." (Heidegger 1977: 17) The process of revealing or making visible as described by Heidegger is perspectival, and a perspective also necessarily hides other or background aspects of the perceived objects.

Visibility and invisibility condition each other in more than one aspect: In the case of technology, this interrelatedness or, to speak with Merleau-Ponty (1969), the *chiasm* (entanglement or intertwining) of visibility and invisibility goes deeper than in the case of perception. Perception is always situated and hence perspectival. There is no perception without a perspective. And that means there is no visibility without the invisible. The dialectic of visibility and invisibility constitutes perception in general.

Beyond the perception of technology as material objects/devices, which is an important topic in its own right (cf. Verbeek 2005), Heidegger sees a causality at work that is not exhausted by the instrumental definition of technology. Through technology we see the world *as* standing-reserve. Thus, technology *produces* visi-

bilities (the life-world as *standing-reserve*) rather than just adding (visible) objects to the world. As mentioned above these visibilities, or rather the all-encompassing style in which technology compels the world to appear as technological in general, also hides something, i.e., makes something invisible: namely, the objective character of things as *Gegenstände*. This opens up another aspect within the broad topic of visibility. What is a thing when its thingness or *Gegenständlichkeit* is hidden?

This is what happens when a tool like a hammer is used: The skilled user is not aware of the hammer as an object. Rather, the hammer becomes a prolongation of the body during usage. As long as the use remains frictionless, the hammer as object will not draw attention. It remains unthematic and its character as an object transparent. Such a use of things as tools is what Heidegger calls throughout his works *"readiness-to-hand"* or availability (*Zuhandenheit*): a description of a certain comportment toward things as being ready to use, being at our disposal. The instrumental attitude of technology makes things appear as means and hides their being as objects.

3. Transparency and Opacity in Technological Objects

If we translate this Heideggerian view of technology into a more common terminology, we arrive at a different form of visibility: namely, *transparency*. A tool or a technological device can be transparent in the sense that the user experience is smooth. Such a smooth user experience (or so-called *"frictionless UX"*) has become the gold standard in technology design and AI is one of the means to achieve this goal. A self-learning software can ideally learn from the user what it means to function smoothly. Any disruptions within the use of applications can further serve as materials from which it can learn and then create smoother functional processes that flow without disruptions.

From a phenomenological perspective disruptions break the everyday attitude of smooth functioning and reveal the thingness and the character of objects as that which stands over against us (*Gegen-stände*). Only then will users have or find a reason to actually reflect on the technology. This also opens up the following possibility: In order to develop a critical attitude, disruption or friction is a necessary component. In neuroscience and philosophy of mind disruption or *prediction errors* is integrated in the model of neural activity as *prediction processing*: "In predictive coding schemes, sensory data are replaced by prediction error, because that is the only sensory information that has yet to be explained. (Feldmann & Friston 2010, p. 2)." (Cited by Clark 2015: 4)

Conversely, this also reveals that functional transparency is at the same time associated with being *opaque*. The constitutive processes of a functioning technology and hence a smooth user experience has to stay hidden in order to perform

this job. In that sense, technological processes are supposed to be *opaque*: They remain hidden throughout the process of usage when they function smoothly. Transparency and opacity are manifest themselves like visibility and invisibility. The difference between the two pairs of concepts is that the case of visibility/invisibility is a more neutral way to describe the givenness of objects in perception.[1] Transparency and opacity tend to have a meaning that includes a *normative* aspect. At least this is the case when we broaden the perspective toward questions of democratization or the potential of AI to foster democracy.

To explain this train of thought in more detail, let me draw a line from the phenomenological use of the concept of transparency to its application in technology. Jean-Paul Sartre uses the concept of transparency in order to describe consciousness or, more narrowly, the imaginary, i.e., modes of consciousness related to images and phantasy. Consciousness constitutes perceptions in various modes without making the constitutive process itself perceptible. It remains transparent in its functionality, meaning that it does not become part of the object presented as perceived, remembered, or anticipated. By analogy, an AI application does not itself become an item of awareness when it functions smoothly.

This becomes clear, when comparing different forms of givenness. For example, just now there is a cup of tea sitting on my desk. My act of seeing the cup of tea is an act of consciousness, an act of visual perception. This is one mode of how consciousness can present a thing: as given to vision, physically being there, within my reach. But the act of perceiving itself is not thematic, is not part of the intentional consciousness of the cup. The workings of consciousness remain transparent and they should do so, because otherwise something could be wrong with our eyesight or the overall state of health. If I remember the cup of tea later on, I will reproduce the visual characteristics of the cup through memory. The correlate of my memory is one produced by my imagination, which gives the cup to my consciousness as if I saw it. Again, the intentional act is perceived as an act of memory, but how this memory is constituted is not thematic in the memory itself. The workings of consciousness remain transparent. They are not thematic

1 Edmund Husserl describes perception in his lectures on *Thing and Space* [1907] as being necessarily inadequate in the sense of necessarily involving aspects that are not directly perceived. Perception of a thing in space is always partial, being enriched step-by-step by changes in perspective and the simultaneous quasi-perception (adumbration) of the hidden sides of the thing: "We see that the continuity of the corporeal thing presupposes 'inadequate' perception, perception through adumbrations that are always capable of enrichment and more precise determination." (Husserl 1997: 101 [121]) This notion of perception necessarily includes perception of the non-perceived. That means human perception does not only conceive of things through adding perspectives consecutively to each other. Rather we are acquainted with spatial and temporal things in such a way that the hidden sides are perceived implicitly. This is what Husserl and Merleau-Ponty call "apperceptions": The perception of the non-perceived.

in the process of cognition. In that sense, these processes are also opaque for the exploring mind. We have no conscious access to the inner workings of the mind. And this usually poses no problem.

In the case of AI, however, it is different: Not knowing how an algorithm arrived at a solution can be highly problematic. If, for example, medical data are analyzed through an AI in order to identify a disposition for cancer, it is necessary to know on which grounds a diagnosis has been generated. Only on these grounds can a decision for preventive treatment be made. The problem is that an AI can generate predictions without being able to give a *reason* for the outcome, the choice of samples, or the method used. There is a categorical difference between the causal processes leading to a mental state or an output of a program, and the ability to give reasons and reflect on mental states, as it is discussed within philosophy of mind.

One can, for example, analyze the modes of consciousness through methods of phenomenological analysis and reflect on the different modes of intentionality in a given situation. Then consciousness as a process loses its transparency. The unthematic act of remembering or imagining becomes itself object of a higher order reflection. But then also a higher order of transparency emerges, namely the focus on constitutive processes of mental states becomes itself an object of perception and hence must itself be constituted. The infinite regress looms large here. The lesson to be learned from Edmund Husserl's analysis of intentionality is that there is always a layer of consciousness that cannot itself be conscious because it itself constitutes a lower level or aspect of consciousness. Consciousness of temporal change, for example, cannot itself be temporal, at least not in the same way as the experience of time is:

> But we should seriously consider whether we must assume such an ultimate consciousness, which would be necessarily an 'unconscious' consciousness; that is to say, as ultimate intentionality it cannot be an object of attention [...], and therefore it can never become conscious in this particular sense. (Husserl 2008: 394)

Consciousness, therefore, is not only transparent as a medium of perception, it must also in some constitutive aspects remain opaque. We cannot understand consciousness simply by being conscious.

Human consciousness is deeply influenced by technology and today in particular by AI (cf. Hansen 2012, Hayles 2012, Stiegler 1998). The *technogenesis* of human consciousness, as Katherine Hayles puts it, opens up another dimension of transparency/opacity. AI is a form of nonconscious cognition (cf. Hayles 2014) that becomes more and more ubiquitous. There is no online-shopping without suggestions generated by an AI; every social media news feed is individualized by algo-

rithms and even airfares are adapted to time, location, and devices. The virtual world is highly personalized through more or less sophisticated AI applications.

Not only are the workings of the devices opaque in the sense that the user does not perceive the actual computational processes and even less so the data gathering that goes along with these processes. Even more so the output generated by AI applications does not necessarily reveal the underlying personalization processes. The Internet is only to a very limited extent a shared world. Most of the contents are shaped through user-AI interactions, though the user is not consciously aware of these interactions. Regarding technology in general, one can observe changes in human behavior and cognition with every new invention. The invention of writing, for example, has deeply altered how people memorize contents and how cultures preserve their traditions. The rise of smartphones has altered completely human ways of communicating. One simple example is communication through messaging devices and social networks: "tele-communication [...] entails a hiddenness of the face, a disappearance of the voice with its tonalities, the assuming of quasi-identities that do not authentically emanate from the concreteness of our being-in-the-world-in-the-flesh." (El Bizri 2018: 130) One could find countless examples of how new visibilities and at the same time opacities are generated through emerging technologies.

The eerie twist comes with AI. Two factors are relevant: The temporal microscale of computational processes and the predictive coding. The first factor, namely, the speed of computational processes that makes them inaccessible for human cognition, generates a scenario in which the second factor, namely, how the predictive coding turns into a preemptive force on human perception. As Mark Hansen writes in considering how computational processes that become a central element in the tissue of the life-world function on temporal microscales beyond our awareness:

> through the distribution of computation into the environment by means of now typical technologies including smart phones and RFID tags, space becomes animated with some agency of its own. One crucial feature of this animation is its occurrence largely outside—or beside—the focal attention of actants within smart environments. For this reason, the intelligent space of contemporary life offers a kind of affordance—an unperceived or directly sensed affordance—that differs fundamentally from affordances as they have been theorized, following upon the work by James Gibson, in relation to media. When "we" act within such smart environments, our action is coupled with computational agents whose action is not only (at least in part) beyond our control, but also largely beyond our awareness. (Hansen 2012: 33)

This description rests on the assumption that human cognition is constituted in relation with or by means of embeddedness in an environment. Hansen coins this as our "environmental condition" (ibid.), which describes the coupling of the individual and its environment. This coupling is not a static relationship, but a very dynamic one—a constant process of becoming. This refers to process ontologies, which either hold that consciousness emerges from being embedded in an environment (cf. Merleau-Ponty 1969, Thompson 2013), or that consciousness even extends into the environment (a version of panpsychism, cf. Chalmers 2013, Whitehead 1929). Without delving into the environmental/ecology debate, I want now to transpose these thoughts into the context of smart environments and AI driven ecologies.

Let me briefly summarize the train of thought leading up to this current juncture. I started out with Heidegger's notion of the essence of technology as enabling condition of visibility or, more concretely, rendering the world perceptible as *standing-reserve*. This aspect of technology is itself not technological; rather it is the constitutive structure of technological thinking and thus underlies and makes possible the visible materiality of technological device. From there I took a detour into how human perception is constituted and showed that visual perception is always situated and hence perspectival. That means aspects of invisibility are a constitutive part of vision or perception in general. The next step of my argumentation transposed the relation of visibility and invisibility into technological artifacts, where we speak of transparency and opacity, rather than of visibility and invisibility. Technological devices become transparent during use just as human consciousness is transparent in perception (the process of the constitution of perception, for example, is not itself object of perception). Technological device function smoothly if there is no disruption and thus no reflection on process of usage required. This transparency is always accompanied by opacity. Although the mechanisms produce functionality, the computational processes remain hidden, which is why digital technologies is often described as black boxes. This gets even more poignant with self-learning algorithms, which are not even fully understood by their programmers.

My aim is to show in the remaining sections how transparency/visibility and opacity/invisibility intertwine and establish new affordances. At this point I will go on with a reflection on smart environments. Smart environments or houses that are turned into an Internet of Things (IoT) exemplify a technology that is governed by self-learning AI, whose main function is prediction. Prediction is necessary because the IoT within a household, for example, is a highly dynamic compound of interlinked processes that has to be adaptive for all kinds of situations and changes. Ultimately, I will argue that AI-driven smart environments differ strongly from low-tech environments for two reasons: (1) predictive responsiveness has not been a common feature of environments before and (2) the prediction

and hence preemptive functionality is modelled around a conception of the ideal human/human behavior. It is here that the political discussion needs to start.

4. Smart Environments: Technologies in the Tissue of the Life-World

Intelligent technologies are being woven into the tissue or the *flesh* (Merleau-Ponty 1969, Rabari, Storper 2015, Förster 2018a) of the life-world, and it is important to understand that this is decidedly *not* a metaphor: Urban spaces consist of countless sensors, cameras, and monitors. Especially megacities like Seoul, Tokyo, London, or New York City have CCTV in literally every corner of the city. Displays are present wherever you look and sensors measuring air quality, light intensity, or listening into the noise of the city go unnoticed, even if you start looking for them. The growing density of connected devices within smart environments creates a growing demand for very small hardware, integrated devices, and high-speed data nets.

While urban spaces, work, and private spaces become more and more technological, hardware in turn becomes less visible. Sensors see without being seen, and hear without being heard. This peculiar phenomenon makes up for the narratives of future life-worlds, especially in contemporary science fiction movies. What is currently advertised or else emerging under the label of IoT or Internet of Everything (IoE) extends AI and thus nonconscious cognition into the last corners of the life-world. The topos of the vanishing of the hardware adds to the functional opacity of AI applications. Users have barely any chance to understand how AI is incorporated in devices when it is actually at work or how it shapes the process or experience of use. On top of this the physical implementation is no longer easy to locate. This means that technological environments are turned into a sensory, responsive surface with nonconscious cognition. Dealing with responsive AI driven environments requires, therefore, new forms of knowledge and behavior, such as an understanding of technological agency. Nonconscious cognition and agency make up for fairly new affordances in daily life. On the one hand side, human behavior and movement needs to be adapted to the technological systems in order for them to work properly. On the other hand side, humans need to reflect on how they want these new technologies to be integrated in their life-worlds. This is precisely the point where an active engagement with new affordances and hence novel cultural structures needs to take place.

The AI's integrated in smart environments actively shape perception, movements, emotions, and rational choices (e.g., elections, ethical choices, etc.). One of the central problems is that AI's exert their influence predominantly on the level of affects (cf. Parisi 2018). This adds a third level of opacity or invisibility: the nudges generated by AI applications are not always perceivable as such. Recom-

mendations in shopping apps are quite straightforwardly nudges. The underlying structures of newsfeed generation are much less obvious. The way we retrieve information from the Internet is always tainted through predictions of underlying learning algorithms. Thus, the world presented through a news feed is a personalized world, generated by an AI that seems to know the user, while the user does not know how the program generates its output. The opacity of nonconscious cognition and agency, as it is operative in AI applications, creates uncertainties concerning current and future social life. Current science fiction movies are symptomatic for a more nervous human condition (cf. Förster 2016). There technology tends to be portrayed as a hidden force that goes through a cognitive evolution and eventually overpowers or leave humanity behind as an outdated life form (e.g. the movies *Her* (USA, 2013) and *Transcendence* [USA, 2014]).

It is an undeniable fact that technology is becoming more and more invisible or at least smaller and more integrated within everyday objects and urban surfaces. Even the skin as a limit is slowly breaking down. Sensors integrated in the body become increasingly more normal, even though the ethical dimension of this is debated. In Sweden, for example, some 3000 people already had such sensors implanted under their skin to replace keys, credit cards, or train tickets. There are two salient characteristics of distributed AI systems today: they become part of the environment (merging in tendency with everyday objects and surfaces, such as refrigerators, surveillance cameras, or Alexa voice assistant), or else parts of devices that function in close proximity to the body or become integrated within the body (clothes with smart fabrics, jewelry, or smart implants). One could say that technology becomes naturalized, if there ever was a clear-cut distinction between the artificial and the natural to begin with.

Smart environments are largely governed by AI because the sheer amount of data generated by the distributed net of devices needs to be digested and made useful. At this stage, we are faced with a complex structure of visibilities and their counterparts. Technology as hardware starts to disappear while its function-potential increases evermore exponentially. This tendency toward invisibility generates a second- (or even third-)order transparency: Not only is technology in its usage transparent, but it becomes transparent as an object. If technology had lost or hidden is object-character already according to Heidegger's consideration, we are now reaching a higher level of *enframing* or *Gestell*. In Heidegger's view technology obstructs our view of the world as object because it compels us to conceive of the world as *standing-reserve*. This basic characteristic also holds for technology: It does not appear as an object that stands over against a subject and, in this respect, transcends human aims. It is a means to an end that makes the environment appear as a predictable, calculable reservoir of potentialities. This new layer of transparency comes into play through the disappearance of technological devices and the emergence of distributed AI. This makes a difference because most of what AI

today has accomplished is predictive and shapes functional processes according to those predictions. For the users, the unknown factors are huge: Users cannot know how exactly the system (e.g., IoT) or even one single device works. Moreover, they cannot know or actively experience better which, when, and how much data are gathered from the usage and behavior relating to these devices. Much less can be known of the use that is made of the collected data. The Big Data problem is becoming discussed ever more widely, and the complexity grows with the increasing use of devices by the hour.

From a phenomenological perspective, the decreasing visibility (and opacity) of smart technologies and their increased potential for agency is problematic for a democratization of AI. And the problem is not AI itself, whose actual intelligence is amazing but also constantly overrated. AI does not have the intention to build a better self, a better society, or a better future. Human beings aim for that. Philosophy is not a stranger to such mostly exaggerated goals. One of the obstacles to a transparent use of AI is this striving towards perfectibility, which is more or less an economic vehicle. Smart technologies have the potential to be useful and maybe even create a better future, but only if a culture of critique and open discourse can be established and sustained. How does this point relate to the topic of visibility? Let me refer to Heidegger one last time. He argues that technology lets the world appear as *standing-reserve*. Today we should ask how human lives appear through technology. How do humans paint an image of human life by creating an environment that is machine-friendly? Do we have the means to make the hidden ratio of what it means to be human flourish in smart environments? How can we create enough freedom and potential for creative agency that allows for an active and critical engagement with existing technologies? That would imply experimenting, tampering, and first and foremost, conducting a critical discourse with industries relying heavily on predictions like retail and insurance businesses. The image of a "good" human life should be scrutinized (also with regard to the concept of the anthropocene). We need, therefore, a close observation of how nudges, prediction, and preemption influences everyday behavior—how we speak, move, and, indeed, smile or love. To do this successfully, humans in their whole range of diversity need to become visible and present as voices in public and in the industries that rely heavily on AI. The *political* dimension of AI is very much a human one. The *human* image built into intelligent technologies needs to be made visible. Only then can an ethical discussion properly take place.

References

Binfield, Kevin, ed. (2004): Writings of the Luddites. Baltimore: Johns Hopkins University Press.

Chalmers, David J. (2013): "Panpsychism and Panprotopsychism." In: *The Amherst Lecture in Philosophy* 8 (2013): 1-35 (www.amherstlecture.org/chalmers2013/).

Clark, Andy (2015): "Embodied Prediction." In: Thomas Metzinger & Jennifer M. Windt (Eds), *Open MIND:* 7(T). Frankfurt am Main: MIND Group. doi: 10.15502/9783958570115

El-Bizri, Nader (2018), "Phenomenology of Place and Space in our Epoch: Thinking along Heideggerian Pathways." In: Erik Champion (ed.), *Phenomenology of Real and Virtual Places*, London: Routledge, 123-143.

Förster, Yvonne (2016): "Singularities and Superintelligence: Transcending the Human in Contemporary Cinema." In: *Trans-Humanities*, Seoul: Ewha Institute for the Humanities (EIH), 33-50.

Förster, Yvonne (2018a): "From Digital Skins to Digital Flesh: Understanding Technology through Fashion." In: *Popular Inquiry* (2), Aalto University Helsinki (www.popularinquiry.com/blog/2018/8/30/yvonne-foerster-from-digital-skins-to-digital-flesh-understading-technolgy-trough-fashion).

Förster, Yvonne (2018b): "Wenn künstliche Intelligenz laufen lernt. Verkörperungsstrategien im *Machine Learning*." In: Christoph Engemann und Andreas Sudmann (Eds.), *Machine Learning. Medien, Infrastrukturen und Technologien der Künstlichen Intelligenz*, Bielefeld: transcript, 325-340.

Hansen, Mark B. N. (2012): "Engineering Pre-Individual Potentiality. Technics, Transindividuation, and 20th-Century Media". In: *SubStance* 41/3 (Issue 129), 32-59.

Hayles, Katherine (2012): *How we Think. Digital Media and Contemporary Technogenesis*, Chicago, London: University of Chicago Press.

Hayles, N. K. (2014): "Cognition Everywhere: The Rise of the Cognitive Nonconscious and the Costs of Consciousness". *New Literary History* 45(2), 199-220.

Heidegger, Martin (1961): *An Introduction to Metaphysics*, New York: Doubleday.

Heidegger, Martin (1967): *Being and Time*. Oxford, Cambridge MA.: Blackwell.

Heidegger, Martin (1977): "The Question Concerning Technology". In: *Essays*, New York, London: Garland, 3-35.

Husserl, Edmund (2008): "On the Phenomenology of the Consciousness of Internal Time (1893-1917)". In: Rudolf Bernet (ed.), Edmund Husserl. *Collected Works IV*, Dordrecht: Springer.

Merleau-Ponty, Maurice (1969): *The Visible and the Invisible*, Evanston: Northwestern University Studies.

Parisi, Luciana (2018): "Automated Cognition and Capital". In: Warren Neidich (Ed.). *The Psychopathologies of Cognitive Capitalism: Part Three*, Berlin: Archive Books.

Pontin, Jason (2018): "Greedy, Brittle, Opaque, and Shallow: The Downsides to Deep Learning". In: *Wired.com*: www.wired.com/story/greedy-brittle-opaque-and-shallow-the-downsides-to-deep-learning/ (26.03.2019).

Rabari, Chirag, Storper, Michael (2015): "The digital skin of cities: urban theory and research in the age of the sensored and metered city, ubiquitous computing and big data." In: *Cambridge J Regions Econ Soc* 8 (1), 27-42. https://doi.org/10.1093/cjres/rsu021

Stiegler, Bernard (1998): *Technics and Time, 1: The Fault of Epimetheus*, Stanford: Stanford University Press.

Sudmann, Andreas (2018a): "On the Media-political Dimension of Artificial Intelligence. Deep Learning as a Black Box and Open AI." In: Mathias Fuchs, Ramón Reichert (eds.): *Digital Culture & Society (DCS)*, Vol.4/1, *Rethinking AI: Neural Networks, Biometrics and the New Artificial Intelligence*, Bielefeld: transcript, 181-200.

Sudmann, Andreas (2018b): "Szenarien des Postdigitalen. Deep Learning als MedienRevolution". In: Christoph Engemann, Andreas Sudmann (eds.): *Machine Learing. Medien, Infrastrukturen und Technologien der künstlichen Intelligenz*, Bielefeld: transcript, 53-73.

Thompson, Evan (2007): *Mind in Life: Biology, Phenomenology, and the Sciences of Mind*, Cambridge MA, London: Harvard University Press.

Verbeek, Peter-Paul (2005): *What Things Do: Philosophical Reflections on Technology, Agency, and Design*, University Park: Pennsylvania State University Press.

Whitehead, Alfred North (1929): *Process and Reality an Essay in Cosmology; Gifford Lectures Delivered in the University of Edinburgh During the Session 1927-28*, New York: Free Press.