



The Humanities and the Rise of AI

Implications of Cultural and Societal Engineering

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Face to Face with the Robot?

Cognitive Science and the Limits of Simulation, or: How AI Shapeshifts What It Means to Be Human

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The Ends of the Humanities - 3

Edited by Isabell Baumann, Till Dembeck, Georg Mein, Johannes Pause and
Christoph Purschke



Melusina Press, 2025

Published in **Melusina Press**, 2025

11, Porte des Sciences

L-4366 Esch-sur-Alzette

<https://www.melusinapress.lu>

Management: Niels-Oliver Walkowski, Johannes Pause

Copyediting: Carolyn Knaup, Niels-Oliver Walkowski

Cover and Layout: Valentin Henning, Erik Seitz

The digital version of this publication is freely available at

<https://www.melusinapress.lu>.

The PDF and the master copy are generated with the help of princeXML.

Print and Distribution is carried out by BoD - Books on Demand, Norderstedt

Bibliographic information of the National Library of Luxembourg: The National Library of Luxembourg lists this publication in the Luxembourg National Bibliography; detailed bibliographic data are available on the Internet at bnl.public.lu.

ISBN (Online)	978-2-919815-79-1
ISBN (PDF)	978-2-919815-80-7
ISBN (Print)	978-2-919815-81-4
DOI (Publication)	10.26298/1981-5791-ftfw
DOI (Volume)	10.26298/1981-5791
DOI (Series)	10.26298/2716-7550
ISSN (Online)	2716-7550

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Face to Face with the Robot? Cognitive Science and the Limits of Simulation, or: How AI Shapeshifts What It Means to Be Human

Sabine Sielke

As legend has it, the field of Artificial Intelligence (AI) was founded in 1955, resting on the confident premise of the so-called Dartmouth Proposal that human intelligence “can be so precisely described that a machine can be made to simulate it” (McCarthy et al. 2006). Even though few scientists and scholars share this optimistic take on the prospect of brain simulation, AI has been inspired by the cognitive sciences, another brainchild of the (Cold War) 1950s. And yet: almost 70 years later we still do not agree on how to define human intelligence, let alone on how to measure it. Moreover, our knowledge of how processes of cognition work has so far remained rather limited. How then can AI possibly go beyond our modest ‘self-reflexive’ insights and simulate complex mental capabilities that remain more or less intransparent?

Based in part on my research on the crossroads between conceptions of memory in cultural studies and the cognitive sciences (Sielke 2015, 2023), my contribution explores how the scope of artificial intelligence and its presumed potential and immense market value have been driven, to a considerable degree, by our narrowly confined sense of human cognition. Despite the fact that the so-called “hard problem” of consciousness (Chalmers 1995) – the question how brain becomes mind – remains unsolved, if not unsolvable, cognition research has gained much cultural, economic, and scholarly prominence, especially from the 1990s “decade of the brain” onward. As neurobiology, molecular genetics, and biotechnology evolved new insights into our corporeality and our interrelation with the world, concepts like consciousness, mind, will, and belief became re-naturalized.

How, I wonder, does this tendency to naturalize our conception of the human play out in the field of AI research and the development of applications informed by what goes by the name of artificial intelligence? And how has AI, in turn, further shifted and transformed our sense of what it means to be human? While the main part of my argument interrogates these questions, my afterthought briefly figures in face recognition and reflects on how AI and robotics do or do not account for intersubjectivity, a crucial dimension of what makes us human.¹

1 My gratitude goes, once again, to Dr. Björn Bosserhoff for professional research and editing assistance as well as for final touches on the manuscript. On these questions, see also Sielke (2022).

Outsourcing the Brain, Optimizing the Body

“All stories begin in our endings,” Mark O’Connell opens his 2017 book *To Be a Machine: Adventures Among Cyborgs, Utopians, Hackers, and the Futurists Solving the Modest Problem of Death*: “we invent them because we die. As long as we have been telling stories,” he writes, “we have been telling them about the desire to escape our human bodies, to become something other than the animals we are” (O’Connell 2017: 1). When we envision the future and imagine today what lies ahead, we serially repeat familiar narratives. Their recursive plots, telling of the takeover by artificial intelligence, the settling of faraway places with better life, the immortality of our bodies, sound mostly new and exciting, as Daniel Hornuff (2019) argues, yet keep informing humanity’s oldest stories. This highly sustainable human desire to transcend ‘human nature’ has driven religious beliefs, philosophical thought, motivations of science and research, as well as modes of storytelling for millennia; it informs the field of artificial intelligence since its emergence in the 1950s,² and it dominates transhumanism. In turn, these have inspired multiple utopian and dystopian narratives of our disembodied future as a “superintelligence,” to use Nick Bostrom’s term (2014), or “singularity,” the concept Ray Kurzweil (1990) prefers. As the founder of the Future of Humanity Institute at the University of Oxford and a major proponent of “longtermism,” Bostrom thus also holds that, if we care about the fate of humanity, our money cannot be invested any better than in AI technologies (see Weisbrod 2022). Operating from 2005 onward, the interdisciplinary research center was closed in May 2024 resulting from conflicts over finances and the future of AI.

AI and transhumanism are two different matters, of course, and we need to clearly differentiate their faiths, goals, and possible futures. My concern, though, is with the common ground they tread: the aspiration to enhance human life and a seeming certainty about what that actually means. To complicate matters, I would like to figure in cognitive science as a field that has fundamentally informed this conversation and its ongoing shifts. Introduced as late as 1973 by chemist and physicist Hugh Christopher Longuet-Higgins, the term cognitive science captures a wide, interdisciplinary domain of research including neuroscience, psychology, philosophy, computer science, esp. AI, and linguistics and aimed at examining the principles on the basis of which intelligent entities interact with their environment (Scheerer 1985: 7). Inspired as much as enabled by developments in computer science, computation, and digitization, current visions of the future of human subjectivity toy with the outsourcing of our brains, their unhinching from our inadequate bodies, bodies incapable to compete with smart machines and still marked with an “expiration date” (Max More, qtd. in O’Connell 2017: 4). AI is thus not so much a “serialized novel” following in the tracks of digitization, as Hornuff suggests; instead, digitization and AI co-evolve.

At the same time, the perceived boundary between human agents and their technological environment has become increasingly porous, and the interfaces between human bodies and their digitized appendages have moved to the forefront of scientific inquiry and marketing strategies (see Sielke and Schäfer-Wünsche 2007). This development was

2 For a detailed history of the “ideas and achievements” of AI see Nilsson (2011).

driven as much by biotechnologies and media as “extensions of man” (to call on Marshall McLuhan 1964) as by notions of the human brain as computer or network and by newest brain-computer interface (BCI) technologies.³

What we consequently observed in recent decades is the interplay of two interdependent tendencies: while privileging and outsourcing the brain as the centerpiece of human subjectivity, both scientific inquiry and cultural practices flaunt an ambition to optimize the human body and “augment our powers of perception and cognition through technological enhancements of our sense organs and our neural capacities” (O’Connell 2017: 5). These interrelated aspirations have managed to channel immense amounts of resources into cognitive science and AI research; and they have also fundamentally and in multiple manners, particularly by agenda setting and practices of defunding, affected our own work as scholars in the humanities and social sciences.

Interestingly enough, despite of our naturalized notions of consciousness and mind, mental processes remain overdetermined by the concept of mind, as computer, disseminated from the 1950s onward — as a machine that stores information to be retrieved at a later moment. This so-called “information-processing” or “artificial intelligence approach” of the cognitive sciences transformed the computer into the master trope of communication and information systems and into a model explanation for how the human mind works. However, the idea that computers possess some kind of intelligence, Terry Winograd and Fernando Flores note (in 1986 already), is based on a misunderstanding of how humans use language and cognize. It rests, as philosopher Ursula Hoffmann explains, on the erroneous assumption “that cognizing creatures collect information on an objectively given reality with objects of distinct attributes and properties in order to construct models or representations, stored to be retrieved and translated into language in thought processes” (222, my translation). As Vernon B. Mountcastle already noted in “Brain Science at the Century’s Ebb” (1998): “Brains and computers differ in many ways, particularly in architecture, in the serial-processing mode in computers versus simultaneous processing in brains, and in the properties of their constituent elements: neurons can take on any one of a series of values over a continuum, transistors in digital circuits only a 0 or 1” (29-30).

As a consequence, by the 1990s, the paradigm of the computer and the Representational/Computational Theory of Mind (RCTM; see Kurthen 2007) made way for the parallel distributed processing approach (PDP). Also called connectionism or neural networks approach, PDP replaces concepts of seriality with notions of “simultaneous processing” (Mountcastle 1998: 31), synchronicity, connectivity, and reversibility.

Whereas earlier information-processing and AI approaches trace mental processes as information progressing through a system in a series of stages, PDP frames cognitive processes “in terms of networks that link together neuron-like units” and that proceed simultaneously rather than step by step or linearly (Matlin 1983: 20). Embracing the trope of the network,⁴ cognitive science adapted a central concept of contemporaneous cultur-

3 BCI refers to systems which, on the basis of measuring and digitizing electrical signals in the brain, allow for a “direct dialog between man and machine” and thus enable a ‘mind control’ of machinery (BCI 2014).

al discourse. This appropriation is indicative not so much of an advanced state of knowledge. Rather, it highlights the ways in which new technologies mold, visualize, and communicate knowledge ecologies. Ultimately, it is secondary whether the computer or the network lends itself as the more poignant trope for how the human mind seems to work. More relevant in his context is that it is us humans who “ascribe to machines mental conditions” (Tetens 1994: 118), and that as soon as mind meant neural network, mind and brain became identical (see Wallach and Wallach 2012: 49-50). As a consequence, the dualism of body and mind seemed to dissolve, yet was in fact re-inscribed while (self-)consciousness became an epiphenomenon of neural processes. At the same time, though, the notion of “mind as computer” and the linguistic register of computer technologies have proven highly sustainable in AI and transhumanism.

All the while, the methods of cognitive science informing AI, such as measuring action potentials in the brain, remain atomistic. Imaging techniques such as the positron emission tomography (PET) certainly do not enable us “to observe the brain thinking,” as neurobiologist Hans-Jochen Heinze claimed (2005). Instead, on accounts of singular activity in select local areas of the brain cognition research keeps building big claims. Accordingly, its popularized versions – disseminated by bestselling authors such as Steven Pinker (1997) and Oliver Sacks (1985) as much as by advertisements for products from food to cars and washing machines to insurances – suggest that humans are virtually identical with functioning brains.⁵ With its dematerialized notion of subjectivity and the demise of the human body (and brain), AI carries this faith even further. Concerned with artificial as opposed to natural minds, AI retains a conception of humans as “brain machines” – a term that, calling on Zygmunt Bauman’s insightful book *Retrotopia* (2017), can be considered truly “retrotopian” in that it uses an outdated term to project a utopian (or dystopian) future (depending on one’s perspective). Marvin Minsky, by contrast, speaks of the brain as “meat machine” (qtd. in O’Connell 2017: 73), suggesting that the previously promoted interface between old, organic, “meaty” and technologically advanced, inorganic material is meanwhile truly obsolete and in dire need of an upgrade. This dated vision of man as machine dominates transhumanist discourse even more evidently: its most optimistic protagonists foresee what they call “whole brain emulation,” that is, the downloading of our brain processes as data and the subsequent production of “substrate independent minds” (O’Connell 2017: 44). As of now, digital technologies, marketed as tools assisting the ‘optimization’ of the human body, have aimed at outsourcing part of the human brain’s capacities and functions.⁶

What cognitive science and AI share is a limited insight in how we cognize. Cognitive science still knows very little about how our brain works; and “[w]hat [little] we know,” writer Siri Hustvedt poignantly remarks, “often becomes an excuse to extrapolate endlessly” (2010: 192; see also Hustvedt 2013). Likewise, though flexibility is a central fea-

4 On that trope, see Sielke (2016).

5 For more on the iconic function of the brain in current advertisement, see Sielke (2019).

6 For an early discussion of how technology extends human bodies, see Tischleder and Winckler (2001). For some time, Fred Adams has critically engaged so-called “extended mind” theories which postulate that cognition could be located beyond the human brain, as in smartphones, for instance; see Adams and Aizawa (2008); Adams (2013).

ture of human intelligence, the algorithms AI currently operates with remain “very simple and inflexible,” as neuroscientist Laurenz Wiskott notes (Wiskott and Glasmachers 2020). In addition, based on available sets of data, they reproduce common assumptions and discriminate against what and who is not considered the norm (as face recognition software, for instance, does). These very limitations legitimize pleas for more research funds, at the expense of the humanities. In turn, the latter have adapted by engaging in what is hailed as “digital humanities” – a variety of scholarship that seems inspired more by what is technologically possible than by the prospect of new insight and eye-opening arguments.

In April 2013, for instance, twenty-three years after US President George H. W. Bush inaugurated the 1990s “decade of the brain” as an effort to booster the “continued study of the brain” and better understand and eventually cure “disorders of the brain” ranging from Alzheimer’s to speech impairments (Bush 1990), the Obama administration announced the BRAIN Initiative (Brain Research through Advancing Innovative Neurotechnologies). Marketed as the exploration of a new frontier, this public-private research initiative proclaimed having “the potential to do for neuroscience what the Human Genome Project did for genomics by supporting the development and application of innovative technologies that can create a dynamic understanding of brain function” (Obama White House 2013). Yet the US is certainly not singular when it comes to such aspirations, driven by a *mélange* of cognitive science, AI, and transhumanism. The “Key Performance Indicators and Targets” of the Human Brain Project (HBP), for instance, a billion-dollar “Flagship Initiative” of the European Commission (in its 2014 version) and geared first of all at a replica of the human brain, has proven particularly ambitious: “[R]econstructions and simulations of the brain,” so the claim goes, “provide a radically new approach to neuroscience, helping to fill gaps in the experimental data, connecting different levels of biological organisation, and enabling *in silico* experiments impossible in the laboratory” (HBP 2014: 11). The project’s agenda to reconstruct the brain *in silico* (i.e., via computational analysis and simulation) somehow echoes the transhumanist fantasy of “mind uploading.” However, deeply invested in “computationalism” and computational neuroscience (see 45, 47, 55), the Human Brain Project can only simulate what we already know about the brain; in part due to the self-referentiality of the complex task, that knowledge remains quite minute, though. After all, using our brain to investigate this very brain (Thornton 2011: 160), we are both subject and object of the inquiry, an inquiry that indeed relies on agents with embodied brains and bodies that are environmentally embedded.

The primary goal of both the US BRAIN Initiative and the European Human Brain Project and its exploration of the complex dynamism of neural processes is to further develop and enhance computer technologies. That goal has guided AI and transhumanism, too. Little attention, though, as critics of the Human Brain Project note, is being paid to the question how thought and behavior evolve from nerve cell activity (Schnabel und Rauner 2013). In other words, the unresolved “hard problem” of consciousness keeps disappearing from our radar, repeatedly.⁷ In fact, by hailing the transforma-

7 On the issue, see, for instance, the 2007 initiative for a “decade of the mind” (Albus 2007).

tion of brain material into “disembodied minds” or “mind uploading” (O’Connell 2017: 43, 46), transhumanism has done away with the difference between brain and mind altogether, just like cognitive science’s sense of brain as mind did, a notion that AI adopted and celebrates.

Face to Face with the Robot: Singularity, Face Recognition, Intersubjectivity

The claim that our brains would be better off without their ill-equipped fleshy containers – some transhumanists consider the human body a “dead format,” “an obsolete technology” (O’Connell 2017: 145) – is certainly not new. “In the 1490s, [...] inspired by reading of the ancient Greek automata,” O’Connell recalls, “Leonardo da Vinci designed and built a robotic knight.” Taking matters a step further, Descartes’s 1630s *Treatise on Man* was “predicated on the idea that our bodies are essentially machines [...] animated by a divine infusion of spirit or soul” (124). We may also think of the many robot impersonators inhabiting (science) fiction, such as Issac Asimov’s *I, Robot* (1950) – a collection of nine stories the author published during the 1940, one of which includes his three laws of robotics. Likewise, Ian McEwan’s 2019 *Machines Like Me* comes to mind.⁸ While these texts engage fundamental ethical questions and ultimately resist a future of mankind handed over to intelligent machines, transhumanism envisions such a future as shiny and bright. By the early 21st century, “futurists” like Anders Sandberg developed the “vision of getting uploaded, of the conversion of human minds into software,” as “central to th[e] ideal of transcending human limitations” (O’Connell 2017: 19). Or as Kurzweil wrote in his book *The Singularity is Near: When Humans Transcend Biology*: “An emulation of the human brain running on an electronic system would run much faster than our biological brains” (2006: 504n27). Dmitry Itskov even speak of a “transfer of an individual’s personality to a more advanced non-biological carrier” (O’Connell 2017: 48).

The seemingly paradoxical, yet synchronic dynamics of outsourcing brain power and enhancing ill-equipped bodies operate in and boost a neoliberal – or late-capitalist – economic framework that invests in who or what proves most fit.⁹ In that framework humanity supposedly progresses, while ‘neo-feudalist’ socio-economic hierarchies get reinforced. Even though AI as of yet fails to master processes of hierarchical decision-making, “a key component of human intelligence” (Stuart Russell qtd. in O’Connell 2017: 101), inequality keeps surging (Bauman 2017: 91), and face-to-face human interaction in the three-dimensional realm is in consistent decline. In this (media) environment evolved the mold of an individual – or singularity, to use the term both Kurzweil and sociologist Andreas Reckwitz (2017) privilege, yet define distinctively¹⁰ – who is both

8 See Teresa Heffernan’s volume *Cyborg Futures* (2019) for interdisciplinary explorations of artificial intelligence and robotics.

9 I engage these matters in more detail in Sielke (2021).

10 Unlike Kurzweil’s techno-futurist projection of singularity, Reckwitz employs singularity as a term indicating the neoliberal self-conception of human subjectivity in late modernity.

self-reliant and interactively “extended,” a subject who affirms his or her agency by singular (consumption) “choices,” including choices about AI applications. All the while, though, according to information technology expert Key Pousttchi, forty percent of all products that sell with the label AI do not actually make use of AI.¹¹ Nor has AI “revolutionized the economy,” as was projected; instead even Goldman Sachs analysts consider AI a speculation bubble, presumably taking some time, though, before bursting (Kilian 2024). As this singular subject takes shape, “social capital” (Putnam) gets devalued, while we are increasingly “putting a premium on self-reference, self-concern and an anti-social edge of self-assertion” (Bauman 2017: 99).

Deprived of team-spirit, solidarity, and sociality, we may thus indeed be enacting versions of the very singularities that transhumanism foresees and that Reckwitz interrogates with much insight. Yet humans become subjects in processes of recognition: the very moment my face gets recognized by another human subject, I am accounted for. In other words: “I” become “I” facing a “you.” No surprise therefore that face recognition constitutes the highest capability of the human visual system; no surprise either that much research capitalizes on face recognition technologies which yield sufficient revenue. At the same time, our increased reliance on these technologies and on digital communication foregrounds that we all are suspect, to a certain degree, and – at least partially – replaceable (even if some are more dispensable than others). Accordingly, finding oneself face to face with a robot is no longer a situation restricted to sci-fi scenarios or feature films like Maria Schrader’s 2021 *Ich bin dein Mensch* (*I’m your man*) where, as part of an experiment, the scientist Alma engages with a humanoid robot trained to fulfill all her desires. During the 2022 Olympic Games in China, robots carried the torch part of its way; and columnist Harald Martenstein jokingly suggested that sex robots, competing with old-fashioned plastic impersonators of sex partners at around € 9,000 and supposedly capable of simulating emotions believably, should be granted to operate on a “consent” mode, too (2021). This in turn raises the issue of robots’ rights.

More pressing is, though, that despite their limitation to certain functions, robots necessarily design and contour the faces and sentiments they supposedly read and simulate. Consequently, they also bear witness to the fact that AI, cognitive science, and transhumanism have newly raised and replied to the question what in fact distinguishes humans from intelligent machines. In 1968, Philip K. Dick’s novel *Do Androids Dream of Electric Sheep?* held that “[e]mpathy, evidently, exist[s] only within the human community, whereas intelligence to some degree [can] be found throughout every phylum and order including the arachnida” (1996: 30-31). Meanwhile, we see both a rising research interest in digital empathy and digital intersubjectivity (see De Vos 2020) as well as resistance in the arts, as in Marie Schrader’s movie or the production *We Are in Time* by British playwright and director Pamela Carter (2020), for instance, which interrogates health issues as an intersubjective (rather than a “singular”) affair: donating a heart may enable a dying person to live longer and make death interlink with celebrations of life.

11 My reference here is to Pousttchi’s contribution to the “Dialog für Strategische Vorausschau und die Zukunft der transatlantischen Beziehungen,” 24-25 September 2020, Center for Advanced Security, Strategic and Integration Studies, University of Bonn.

Not I live on eternally as a singular outsourced brain; another fully human body and mind does. Now there's an idea or narrative, admittedly not a new one either, but one that recalls O'Connell's claim that "[a]ll stories begin in our endings: we invent them because we die." Carter's story, however, does not bespeak "the desire to escape our human bodies, to become something other than the animals we are" (O'Connell 2017: 1). It enacts the desire to live in an environmentally embedded human body and mind – a desire that transhumanists might consider retrotopian, too.

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