Selected Papers of #AoIR2024:
The 25th Annual Conference of the
Association of Internet Researchers
Sheffield, UK / 30 Oct - 2 Nov 2024

CRITICAL PERSPECTIVES ON COMMUNICATIVE AI

Current media coverage surrounding ChatGPT, LaMDA, and Luminous has brought questions about the automation of communication into the mainstream. Artificially intelligent media are no longer merely mediating instances of communication but are themselves becoming communicative participants. This has generated broad public discussion about these systems and others and the challenges they bring to domains such as education, public discourse, and journalistic production. Much of this new "AI hype" (Züger et al. 2023) revolves around the question of whether such systems will soon "replace" humans as workers in these various domains, whether they will develop "super intelligence" and as a result challenge or even marginalize the human species.

While this question of the "intelligence" of such systems is always at the forefront of public debate, another is probably more decisive for their critical consideration. As Elena Esposito has put it, the crucial point is less "that the machine is able to think but that it is able to communicate" (Esposito 2017: 250). To put it another way, the human attribution of "intelligence" to systems of automated communication is itself a communicative construction (Lind & Dickel 2023; Natale 2021). Accordingly, we should focus more on the communicative function of AI, as this simplifies the task of questioning the attribution of intelligence to these systems.

Reflecting this, the term "communicative AI" has become internationally established (e.g., Dehnert & Mongeau 2022; Guzman & Lewis 2020; Hepp et al. 2023; Schäfer & Wessler 2020; Stenbom et al. 2021). We can now understand communicative AI as a sensitizing concept: Following Herbert Blumer, a sensitizing concept offers "a general sense of reference and guidance in approaching empirical instances" (Blumer 1954: 7). From this starting point, communicative AI draws our attention to a certain "family resemblance" (Wittgenstein 1971: 65-71) that various examples of today's automated communication systems share: Communicative AI (1) is based on technologically advanced forms of automation for the purpose of communication, (2) is embedded within digital infrastructures, and (3) is closely entangled with human practices.

With this panel, we would like to introduce this discussion but give it a new twist by asking what a *critical perspective* on communicative AI should look like. If these systems of "automated media" (Andrejevic 2020) are not about intelligence, but about

Suggested Citation (APA): Hepp, A.; Couldry, N.; Bolin, G.; Velkova, J.; Brevini, B. (2024, October). *Critical Perspectives On Communicative AI*. Panel presented at AoIR2024: The 25th Annual Conference of the Association of Internet Researchers. Sheffield, UK: AoIR. Retrieved from http://spir.aoir.org.

communication, what should a critical approach to them consider? Raising this question, we want to present five key critical perspectives on communicative AI.

The first paper develops a critical *perspective on the visions of pioneer communities*. It poses the question of whether today's pioneering communities ultimately reproduce basic patterns of the old Californian Ideology in relation to communicative AI. A second paper focuses on the *perspective of data colonialism*. In essence, it is about showing that a critical engagement with communicative AI means addressing the question of the extent to which systems of automated communication are linked to existing data infrastructures and nexus models of exploitation. The third paper highlights the perspective of *economic value production*. Since more and more social situations include human-machine communication, more social interactions become possible to monetize. This relates not only to commercial settings, but also in the public sector as it relates to the welfare state. The fourth paper focuses on a *material perspective*. At its core is the question of how Big Tech procures power for data centres to construct the emerging geography of cheap computational labour needed for communicative AI. The fifth paper deals with the *perspective of an eco-political economy* of communicative AI. Through this prism, the question of the ecological consequences of communicative AI can be addressed. By contrasting these five critical perspectives on communicative AI, we want to discuss what an overarching, critical approach to communicative AI might look like.

References

Andrejevic, M. (2020). *Automated Media*. London: Routledge.

Blumer, H. (1954). What is wrong with social theory? *American Sociological Review*, 19, 3-10.

Dehnert, M., & Mongeau, P. A. (2022). Persuasion in the age of artificial intelligence (AI): Theories and complications of AI-based persuasion. *Human Communication Research*, 48(3), 386-403. doi:10.1093/hcr/hqac006

Esposito, E. (2017). Artificial communication? The production of contingency by algorithms. Zeitschrift für Soziologie, 46(4), 249-265. doi:10.1515/zfsoz-2017-1014

Guzman, A. L., & Lewis, S. C. (2020). Artificial intelligence and communication: A Human-Machine Communication research agenda. *New Media & Society*, 22(1), 70-86. Retrieved from https://journals.sagepub.com/doi/pdf/10.1177/1461444819858691

Hepp, A., Loosen, W., Dreyer, S., Jarke, J., Kannengießer, S., Katzenbach, C., . . . Schulz, W. (2023). ChatGPT, LaMDA and the hype around Communicative AI: The automation of communication as a field of research in media and communication studies. Human-Machine Communication, 6, 41-63. doi:10.30658/hmc.6.4

Schäfer, M. S., & Wessler, H. (2020). Öffentliche Kommunikation in Zeiten künstlicher Intelligenz. Publizistik, 65(3), 307-331. doi:10.1007/s11616-020-00592-6

Stenbom, A., Wiggberg, M., & Norlund, T. (2021). Exploring communicative AI: Reflections from a Swedish newsroom. Digital Journalism, 1-19. doi:10.1080/21670811.2021.2007781

Lind, M., & Dickel, S. (2023). Speaking, but having no voice. Negotiating agency in advertisements for intelligent personal assistants. *Convergence*. doi:10.1177/13548565231192100

Natale, S. (2021). *Deceitful media*. Oxford University Press.
Wittgenstein, L. (1971). Philosophische Untersuchungen (1. ed.). Frankfurt a.M.: Suhrkamp Verlag.
Züger, T., Kuper, F., & J, F. (2023). Handling the hype: Implications of AI hype for public interest tech projects. TATuP, 32/3, 34-40. doi:10.14512/tatup.32.3.34

PIONEERS OF COMMUNICATIVE AI: VISIONS OF DIGITAL FUTURES AND THE CALIFORNIAN IDEOLOGY

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The impact of imaginaries of possible futures on technological development, as well as their establishment and enforcement by individual collectives, has been demonstrated by studies on the history of the internet (Barbrook 2007; Flichy 2007). This is also the context for an increasing interest in the role media play in the construction of possible futures (see, for example, Pentzold et al. 2020; Zylinska 2022). Research on this includes the investigation of science fiction as a form of "prototyping" technological futures (Bell et al. 2013), the challenges of (politically) communicating the future (Bennett 2020), technologies and the remaking of journalism's future (Lischka et al. 2022), the role of "design" for technology-related futures (Macgilchrist et al. 2023) or the contribution of media coverage of technology fairs to the construction of possible futures (Schwarzenegger & Balbi 2020).

Sharing this trajectory, recent research has focused on investigating sociotechnical imaginaries of artificial intelligence. Studies have addressed the role of AI imaginaries in governance (Hoff 2023), the spread and transformation of AI imaginaries in public discourse (Bareis & Katzenbach 2022; Nguyen & Hekman 2022), and analysed AI imaginaries of professional and everyday practitioners (Bulathwela et al. 2021; Hautala & Heino 2023; Pink et al. 2022; Sartori & Bocca 2023), cultural differences between and conflicts over AI imaginaries (Bakiner 2023; Hassan 2022) or the role of AI Imaginaries in various forms of activism (e.g., Lehtiniemi & Ruckenstein 2019; Kazansky & Milan 2021).

In this paper, I would like to take a critical look at the question of which groups in particular shape our ideas and our imaginaries of communicative AI. If you raise this question, you invariably discover the influence of so-called "pioneer communities" (Hepp 2024). Pioneer communities can be described as figurations of people playing a pioneering role within a specific thematic area. However, these are not just groups of scientists, but "intermediaries" (Bourdieu 2010) between different domains of society (science, technology development, everyday use, technology journalism, politics, etc.). Despite an inclination to label themselves as such, they also do not fit the sociological definition of social movements due to their low level of politicization and close ties to business. What pioneer communities share with scientists and social movements, though, is that they engage in experimental practices while crafting visions for potential digital futures.

As I argue in my paper, it is crucial for a critical view of communicative AI to take a look at these pioneer communities. The reason is that they have played—and continue to play—a significant role in the emergence of technologies that we refer to as communicative AI. There are several indications of pioneer communities' historical role and influence in the development of ComAI. The San Francisco Bay Area (where Stanford University and Silicon Valley are located) and Massachusetts (where MIT is located) have been dominating geographical contexts for this developmental history (Berlin 2017; Markoff 2015). For example, the Whole Earth Network as a "first generation" pioneer community had a proximity to the Stanford Research Institute (SRI) from which Apple's Siri later emerged. Likewise, Stewart Brand, as a main figure in this network, had close ties to the MIT Media Lab and contributed significantly to establishing the myth of this institution with his book about it and the organization of related conferences (Brand 1987). A similar significance can be attested to Kevin Kelly (1992) with "Out of Control" and his involvement with *Wired* and the *Global Business Network*, co-founded by Stewart Brand, Peter Schwartz and others. As Fred Turner (2006) has pointed out, the Whole Earth Network contributed, among other things, to the spread of ideas such as cybernetics, which is again characterized by notions of hybrid figurations, or, in the vocabulary of cybernetics, human-machine control circuits. Rob Kling and Suzanne Iacono (1988: 230f.) see here the early influence of an "artificial intelligence" movement, which they describe as a former scientific movement that increasingly mixed with popular cultural ideas. Since then, a second and third generation of pioneer communities emerged, again shaping our imaginaries of communicative AI. Examples of this are the Hacks/Hackers, who have had a considerable influence through their visions of data journalism and later automated journalism, or Reboot, which understands itself as a "community reclaiming techno-optimism for a better future

Taking on these reflections, I would like to structure my presentation in three parts. In the first, I will use publications on historical pioneer communities to show how they disseminated their visions of communicative AI early on—i.e., from the 1980s onwards, increasingly intensifying since the 1990s—and were able to establish them in the public discourse. In part two, I will use a media ethnography based on qualitative interviews, observations, and analyses of their own publications to take a closer look at two pioneer communities in particular that have played and continue to play a role in the field of communicative AI: the Hacks/Hackers movement and Reboot. Using these two examples, I will examine overarching patterns in the activities of pioneer communities. In a third and final part, I will then analyse the visions of communicative AI that are developed in these pioneer communities. In doing so, I question the implicit models of societal communication that these pioneer communities possess, i.e., generalized ideas of how they imagine communication as an ideal. I am particularly interested in the links between these models and the "Californian Ideology" (Barbrook & Cameron 1996; Dickel & Schrape 2017; Hepp et al. 2023; Marwick 2017)—and where these models might lead going forward.

References:

Bakiner, O. (2023). Pluralistic sociotechnical imaginaries in Artificial Intelligence (AI) law: The case of the European Union's AI Act. Law, Innovation and Technology, 15(2), 558-582. doi:10.1080/17579961.2023.2245675

Barbrook, R. (2007). Imaginary futures: From thinking machines to the global village. London: Pluto Press.
Barbrook, R., & Cameron, A. (1996). The Californian ideology. Science as Culture, 6(1), 44-72.
Bareis, J., & Katzenbach, C. (2022). Talking AI into Being: The narratives and imaginaries of national AI strategies and their performative politics. Science, Technology & Human Values, 47(5), 855-881. doi:10.1177/01622439211030007
Bell, F., Fletcher, G., Greenhill, A., Griffiths, M., & McLean, R. (2013). Science fiction prototypes: Visionary technology narratives between futures. Futures, 50, 5-14. doi:10.1016/j.futures.2013.04.004
Bennett, W. L. (2020). Communicating the future: Solutions for environment, economy and democracy. Cambridge: Polity.
Berlin, L. (2017). Troublemakers. New York: Simon and Schuster.
Brand, S. (1987). The Media Lab: Inventing the future at MIT. New York: Viking.
Bulathwela, S., Pérez-Ortiz, M., Holloway, C., & Shawe-Taylor, J. (2021). Could AI democratise education? Socio-technical imaginaries of an edtech revolution. arXiv, 2112.02034v1. Retrieved from http://arxiv.org/abs/2112.02034v1
Dickel, S., & Schrape, J.-F. (2017). The renaissance of techno-utopianism as a challenge for responsible innovation. Journal of Responsible Innovation, 4(2), 289-294. doi:10.1080/23299460.2017.1310523
Flichy, P. (2007). The internet imaginaire. MIT Press.
Hassan, Y. A. O. (2022). The globalization of artificial intelligence: African imaginaries of technoscientific futures. In. York University, Toronto, Ontario: Dissertation. Retrieved from https://yorkspace.library.yorku.ca/bitstreams/df47bf21-3de8-4b24-b872-c615d067312f/download
Hautala, J., & Heino, H. (2023). Spectrum of AI futures imaginaries by AI practitioners in Finland and Singapore: The unimagined speed of AI progress. Futures, 153, 103247. doi:10.1016/j.futures.2023.103247
Hepp, A. (2024). Curators of digital futures: The life cycle of pioneer communities. *New Media & Society*, Online First. doi:10.1177/14614448241253766
Hepp, A., Schmitz, A., & Schneider, N. (2023). Afterlives of the Californian Ideology: Tech movements, pioneer communities, and imaginaries of digital futures – An Introduction to the thematic issue. *IJoC*, *17*, 4142-4160. Retrieved from https://ijoc.org/index.php/ijoc/article/view/21405
Hoff, J.-L. (2023). Unavoidable futures? How governments articulate sociotechnical imaginaries of AI and healthcare services. Futures, 148, 103131. doi:10.1016/j.futures.2023.103131
Kazansky, B., & Milan, S. (2021). “Bodies not templates”: Contesting dominant algorithmic imaginaries. New Media & Society, 23(2), 363-381. doi:10.1177/1461444820929316
Kelly, K. (1992). Out of control: The rise of neo-biological civilization. Boston: Addison-Wesley.
Kling, R., & Iacono, S. (1988). The mobilization of support for computerization: The role of computerization movements. Social Problems, 35(3), 226-243.
Lehtiniemi, T., & Ruckenstein, M. (2019). The social imaginaries of data activism. Big Data & Society, 6(1), 205395171882114. doi:10.1177/2053951718821146

Lischka, J. A., Schaetz, N., & Oltersdorf, A.-L. (2022). Editorial technologists as engineers of journalism's future: Exploring the professional community of computational journalism. Digital Journalism, 1-19. doi:10.1080/21670811.2021.1995456
Macgilchrist, F., Allert, H., Cerratto Pargman, T., & Jarke, J. (2023). Designing postdigital futures: Which designs? Whose futures? Postdigital Science and Education. doi:10.1007/s42438-022-00389-y
Markham, A. (2021). The limits of the imaginary: Challenges to intervening in future speculations of memory, data, and algorithms. New Media & Society, 23(2), 382-405. doi:10.1177/1461444820929322
Markoff, J. (2015). Machines of loving grace. HarperCollins.
Marwick, A. (2017). Silicon Valley and the social media industry. In J. Burgess, A. Marwick, & T. Poell (Eds.), Sage Handbook of Social Media (pp. 314-329). London: Sage.
Nguyen, D., & Hekman, E. (2022). The news framing of artificial intelligence: a critical exploration of how media discourses make sense of automation. AI & SOCIETY, 1-15. doi:10.1007/s00146-022-01511-1
Pentzold, C., Kaun, A., & Lohmeier, C. (2020). Imagining and instituting future media: Introduction to the special issue. Convergence: The International Journal of Research into New Media Technologies, 26(4), 705-715. doi:10.1177/1354856520938584
Pink, S., Berg, M., Lupton, D., & Ruckenstein, M. (2022). Everyday automation. Experiencing and anticipating emerging technologies. London: Routledge. doi:10.4324/9781003170884-3
Ruppert, E. (2018). Sociotechnical imaginaries of different data futures. Rotterdam: Erasmus University Rotterdam.
Sartori, L., & Bocca, G. (2023). Minding the gap(s): Public perceptions of AI and socio-technical imaginaries. AI & Society, 38(2), 443-458. doi:10.1007/s00146-022-01422-1
Schwarzenegger, C., & Balbi, G. (2020). When the 'Messiah' went to 'Mecca': Envisioning and reporting the digital future at the CeBIT tech fair (1986–2018). Convergence: The International Journal of Research into New Media Technologies, 26(4), 716-731. doi:10.1177/1354856520909528
Turner, F. (2006). From counterculture to cyberculture: Stewart Brand, the Whole Earth Network, and the rise of digital utopianism. Chicago: University of Chicago Press.
Wang, J. (2022). Letter from the editor. Kernel, 1, 6-7.
Zylinska, J. (Ed.). (2022). The future of media. London: Goldsmiths Press.

AI AS KNOWLEDGE CAPTURE AND COLONIAL LANDGRAB

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This paper will propose a new perspective for interpreting AI, and in particular communicative AI, in the framework of data colonialism developed by Nick Couldry and Ulises Mejias (Couldry and Mejias, 2019; Mejias and Couldry 2024). By connecting the

data colonialism framework to questions inspired by the sociology of knowledge, it proposes to explore better how AI works to reappropriate and reorganize social relations.

In practical terms, AI, and particularly communicative AI in the form of chatbots such as Chat-GPT, represents simply the application of a massive recent increase in simultaneous computation, across trillions of variables and vast data inputs. But how can we understand communicative AI socially, that is, a form of social relations? The paper will argue that, while of course, communicative AI has been developed as part of advanced capitalism, it is best understood as social relation in terms of the framework of data colonialism (understood as 'an emerging order for the appropriation of human life so that data can be continuously extracted form it for profit'). Data colonialism, Couldry and Mejias argue, is the continuation of five centuries of colonialism's interlocking relations with capitalism or, more simply, just the latest in a long series of colonial landgrabs. AI's continuation of this trajectory is clear, since generative AI treats the whole world of human communicative production and language as its input, or, in colonial terms, its territory.

In this respect communicative AI represents even a stage beyond the other examples of data colonialism that have been discussed in particular spheres of everyday life, such as the smart home (Goulden 2019; Hurel and Couldry 2022) and social welfare (Magalhaes and Couldry 2021). Rather than being based in a particular area of life, communicative AI takes human culture as a whole as its input, and involves its users in a new type of data relation (Couldry and Mejias 2019) from which further input to large language models is garnered through our own interactions with those models conversationalized interface. Seeing generative AI from a colonial perspective enables us both to foreground the changed relation to knowledge resources and cultural production that it represents (as reflected in current lawsuits, for example by the New York Times against Open AI and Microsoft), but also to consider critically the changed social relations that will result from communicativeAI's extremely rapid move to appropriate human cultural production. In this way, although the applications of communicative AI seem very general, they can be seen to have quite specific effects.

Without in any way denying the scientific power of large-scale AI for specific calculative goals (for example the computation of protein structures) that remain under harnessed to specific scientific projects that require extreme levels of computation complexity, AI as a vision that is spreading today across business and professional life can be expected to have number of quite specific social effects, which are best approached not only through a decolonial framework, but also via the sociology of knowledge.

When considered from the point of view of sociology of knowledge, communicative AI is much more than a technique of computation, or a product that offers a humanized interface with vast calculative power. Communicative AI is an attempt to alter the social construction of knowledge (Berger and Luckmann 1974). A search question that generates multiple ranked answers is converted into a truth question that generates one composite answer in language that mimics a human response; through this new format, AI is also asked to perform tasks that aimed at expressing truth or opinion. AI offers to mimic the outputs of human rationality through means that are not human.

The paper will argue that, in order to understand the social force of this transformation, it is important to go beyond the fact of appropriation (the colonial act) and consider the new social forms that are emerging around this act. First, there is the social alchemy of transforming massive expansion of computing power into something socially recognized as 'intelligence' and potentially 'knowledge'. This can be understood as an act of ideology (Lanier and Weyl 2020) that benefits material interests within the Big Tech industries. Second, along with this ideology, comes a more expansive AI discourse that can be understood as a form of myth: a myth that renames computing power as a social force; a myth that begins to reorder social reality by extracting knowledge and cultural production from its original context and converting into a 'raw' input for a new product that makes no reference to that original context; a myth that potentially reframes existing contexts of knowledge production (for example the classroom, law court and newsroom) and reorganizes them around the 'efficient' use of AI products, destabilizing pre-existing forms of cognitive expertise and authority.

The result, the paper argues, is to reimagine the whole domain of knowledge production from the privileged perspective of massive commercially-controlled computing power, in effect privatizing in a fundamental way the production of knowledge for public circulation (Ferrari, Van Dijck and van der Bosch 2023), while imagining away that actual limits of large-scale AI as a process of knowledge production (Bender et al 2021).

The paper concludes by arguing that, through this combined approach that links the data colonialism framework to the perspective of sociology of knowledge, we can come closer to grasping the huge social import of the emergence of communicative AI as both cultural and social phenomenon since late 2023. While public debate has recently been dominated by discussion of the supposed 'existential risks' posed by runaway AI in the distant or medium-term future (Suleyman 2023), the paper will conclude that the real 'existential risk' posed by AI is to the frameworks of knowledge generation on which today's social construction of reality has until now relied – a challenge which is happening without consultation, and under disguise of AI marketing that offers only more 'personalized' products, whether in the sphere of education, health or elsewhere. It is important in response to resocialize our approach to large-scale AI in ways that highlight its 'artifictional' relations to our existing social realities (Collins 2018) and grasp how actual social relations of knowledge production are being silently reconfigured without our consent

References

Bender, Emily, Timnit Gebru, Angelina McMillan-Major, and Shmargaret Shmitchell (2021): 'On the Dangers of Stochastic Parrots: Can Language Models be too Big?', https://doi.org/10.1145/3442188.3445922

Berger, P. and Luckmann, T. (1974): The Social Construction of Reality. Penguin.

Collins, Harry (2018): Artifictional Intelligence. Polity.

Couldry, Nick and Mejias, Ulises (2019): The Costs of Connection. Stanford University Press.

Goulden, Murray (2019): '"Delete the Family": Platform families and the colonization of the smart home', Information Communication & Society 24(7): 903-920.

Hurel, L. and Couldry, N. (2022): Colonizing the Home as Data Source: Investigating the Language of Amazon Skills and Google Actions, International Journal of Communication, 16: 5184-5203
Magalhães, J. and Couldry, N. (2021): Giving By Taking Away: Big Tech, Data Colonialism, and the Reconfiguration of the Social Good, International Journal of Communication, 15: 343-362
Mejias, Ulises and Couldry, Nick (2024): Data Grab. W. H. Allen.
Suleyman, Mustafa (2023): The Coming Wave. Bodley Head.

WHAT'S THE VALUE OF COMMUNICATIVE AI? A CRITIQUE OF VALUATION IN AUTOMATED MARKETS

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The rise and proliferation of communicative AI in the form of chatbots, virtual assistants and companions, and other communicational agents has been discussed with increasing intensity over the last decade (Gehl & Bakardjieva 2016; Guzman 2019; Hepp et al. 2023; Natale 2021), and their implications for the activities and operations within a variety of social domains have been analyzed. Examples of such research have concerned the everyday life in the family (e.g., Hurel & Couldry 2022; Mascheroni 2024), automated social services (e.g., Kaun & Dencik 2020), newsroom decision making and news evaluation (Stenbom et al. 2023), just to name a few areas. However, communicative AI arguably also has transformative implications in other social domains. One such domain concerns the digital markets of the contemporary capitalist economy, where communicative AI becomes a source of value extraction through the expansion of the area of the social. This theoretical paper discusses such value generating practices, responding to the question: How can we understand the role of communicative AI in the expansion of digital, datafied markets, and what implications does this expansion have for non-commercial valuation processes related to social, cultural and public value?

The argument will proceed in three steps: First, a brief outline of the developments within different stages or varieties of capitalism will be provided. Second, it will be proposed that data capitalism is expanding by incorporating human communication as a resource to be extracted. Third, the paper will discuss examples of communicative AI that expand the markets through datafication of human machine communication.

Capitalism as an economic system is defined by its drive for constant economic growth across all market sectors, including those concerning media and communication. In all forms of capitalism, from merchant capitalism over industrial, information (Castells 1996), and now surveillance capitalism (Zuboff 2015) or data capitalism (West 2019), this has meant a drive to expand markets, or for increased speed in turnover. While the shift from industrial to market capitalism introduced a more pronounced emphasis on nontangible commodities (e.g., information), the shift to data capitalism has meant a more pronounced focus on data as the main source of value. Since data is harvested from social action in

digital space, it has meant that *the social* has taken on a more central role as a source for value generation through the commodification of all social action online that can be extracted, processed and packaged into commodity form and circulated on the market (see Bolin 2011; van Dijck 2014). In addition, the fact that more and more of social life occurs online means that areas of the social that have previously been unable for commercial markets to exploit has become accessible for monetization purposes (Bolin 2012). Arguably, with communicative AI, this expansion now continues into the very heart of the social: human communication.

If we can agree that social life takes on a more prominent position in data capitalism as a source of value generation, communication will also be important, since communication is at the root of all social relations. However, up until relatively recently, communication has mainly (although not exclusively) been centered on communication between humans, that is, between two or more "morally autonomous" selves in the words of John Durham Peters (1999: 20). However, with the proliferation of human-machine communication in increasingly more spheres of everyday life, one of these selves can be replaced by a conversational agent. This means that also machines can be part of the production of communicative acts fit to be extracted, processed and commodified and included in the market system.

Although Karl Marx (1867/1976) famously insisted that machines cannot produce surplus value, since they do not contain the human capacity to produce more than it takes for the reproduction of the labor power, we could argue that although machines might not be able to produce value on their own, they can indeed expand the human capacity—become "extensions of man", as McLuhan (1964) would argue—through engaging in communication with humans. Since chatbots and other communicative AI interacts with a social subject, there will be an extractable resource that can be turned into economic revenues and possibly also economic value. Seen from the perspective of expansion of markets, this means that the shift from informational to data capitalism has brought with it *both* an increased speed in turnover due to technical advances in logistics, "just-in-time" supplies, the abandonment of storage facilities, etc., *and* an expansion of markets into domains previously untouched by the market, in this case human communication.

Against the background of this line of argument, the paper proposes that data capitalism extends the domains in which economic value can be produced. However, since increasingly more social situations include human-machine communication, more social interactions become possible to monetize, not only in commercial settings, but also in the public sector in welfare states, where, for example, administrative public services have become transformed from personal meetings over the phone or face-to-face to communicative acts between a customer or client and a chatbot system. This means that economic logics are also introduced into non-market domains, where other value forms than the economic are central – social, cultural or public values that are coupled with other valuation regimes than the commercial or economic (Bolin 2022). An important question is what happens to the valuation practices within these domains as they become colonized by the logics of the market.

The paper will end with examples of how these market expansions occur in the public sector of welfare, health and education, and what types of implications for valuation

processes this might have. In all these sectors, we can find an increase in automation of relations between welfare workers and their clients, medical staff and their patients, and teachers and educational staff with their pupils and students. Normally, these are not social relations that are market relations, and they are not evaluated according to norms from economic valuation practices. The question is to what extent they are drawn into and possibly subsumed market logics, and how this will affect their valuation practices.

References

Bolin, G (2011) *Value and the Media. Cultural Production and Consumption in Digital Markets*. Farnham: Ashgate.

Bolin, G (2012) Personal Media in the Digital Economy. In Pelle Snickars & Patrick Vonderau (eds): *Moving Data. The iPhone and the Future of Media*, New York: Columbia University Press, pp. 91-103.

Bolin, G (2022) The Value Dynamics of Data Capitalism: Cultural Production and Consumption in a Datafied World. In Andreas Hepp, Juliane Jarke & Leif Kramp (eds) *New Perspectives in Critical Data Studies: The Ambivalences of Data Power*. London: Palgrave, 167-186.

Castells, M (1996) *The Rise of the Network Society. The Information Age: Economy, Society and Culture Vol. I.*Malden & Oxford: Black well.

Gehl, RW & M Bakardjieva (Eds.) (2016) *Socialbots and their friends: Digital media and the automation of sociality*. London: Routledge.

Guzman, AL (2019) Voices in and of the machine: Source orientation toward mobile virtual assistants. *Computers in Human Behavior, 90*, 343–350. https://doi.org/10.1016/j.chb.2008.03.008

Hepp, A, W Loosen, S Dreyer, J Jarke, S Kannengießer, C Katzenbach, C, R Malaka, M Pfadenhauer, C Puschmann & W Schulz (2023) ChatGPT, LaMDA, and the hype around communicative AI: The automation of communication as a field of research in media and communication studies. *Human-Machine Communication*, 6, 41-63. https://doi.org/10.30658/hmc.6.4

Hurel, LM & N Couldry (2022) Colonizing the Home as Data-Source: Investigating the Language of Amazon Skills and Google Actions. *International Journal of Communication* 16: 5184–5203.

Marx, K (1867/1976) *Capital. A Critique of Political Economy. Volume One*. London: Penguin Books.

McLuhan, M (1964) *Understanding Media: The Extensions of Man*. New York: McGraw-Hill.

Kaun, A & L Dencik (2020) Datafication and the Welfare State. Global Perspectives

Natale, S (2021) Communicating Through or Communicating with: Approaching Artificial Intelligence from a Communication and Media Studies Perspective. *Communication Theory*, *31*(4), 905–910.https://doi.org/10.1093/ct/qtaa022

Peters, JD (1999) *Speaking into the air: A history of the idea of communication*. Chicago: Chicago University Press.

Stenbom, A, M Wiggberg & T Norlund (2023) Exploring Communicative AI: Reflections from a Swedish Newsroom, *Digital Journalism*, 11(9): 1622-1640, https://doi.org/10.1080/21670811.2021.2007781

West, SM (2019) Data Capitalism: Redefining the Logics of Surveillance and Privacy. *Business & Society* 58(1): 20–41.

Zuboff, S (2015) Big Other: Surveillance Capitalism and the Prospects of an Information Civilization. *Journal of Information Technology* 30(1): 75–89.

POWERING COMPUTERS, DISMANTLING PUBLIC VALUES: THE ENERGY POLITICS OF COMPUTATION WORK IN SWEDEN

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Amidst debates about the societal transformations that communicative AI and its underlying technologies of machine learning and large language models are bringing, one thing is certain: they will require computers and electricity. Since more than a decade, tech giants have been searching for places to station their computers and power them with “good” electricity that is cheap, abundant, non-intermittent and labelled as “green”. One such region are the Nordic states with their well-developed, affordable electricity and communication infrastructure networks built around public values of openness and universal provision of connection. Today, Google has its largest European data center in Finland; AWS owns an expanding data center complex that stretches across three towns in Sweden; while Facebook and Microsoft have several data centers in Sweden and Denmark. Google and AWS also own the electricity of some of the biggest, recently built wind-power production plants in Sweden.

In this paper I examine the practices through which Big Tech procures electricity for data centers in Sweden to produce an emergent geography of cheap computation work needed for computation intense technologies, including communicative AI. Specifically, I discuss how these practices dismantle core public values associated with the welfare state while fueling conflicts between Nordic states and their citizens.

In my approach, I build on and extend work on media backends (Parks et al., 2023), the materialities of AI (Crawford, 2021), and digital energetics (Ortar et al., 2023; Pasek et al., 2023). I situate energy infrastructure as arrangements of sociotechnical relations shaped by different values embedded in things – devices, electric wires, wind turbines and nuclear reactors – and decisions about where electrons should travel, how, at what cost, from whom and to whom (Akrich, 1997). As decades of work in science and technology studies has shown, energy does not exist in the void – electricity is transported to homes and computers through energy infrastructures that have their own dynamics, materialities, markets and logics of operation, and that differ across national contexts. In Sweden, historically, electricity distribution has been part of the project of creating the welfare state, making electricity affordable and available to anyone through grid design and regulatory arrangements that have persisted despite liberalization.

As data giants tapped into Swedish grids to power their computers, societal and infrastructural controversies ensued. I engage in this paper with two such controversies: 1) when Microsoft reserved grid capacity for its data center in the Southern region of Skåne and a local bread producer could not get on the same grid in the area to build a baking factory due to lack of grid capacity; and 2) when Google materialized a wind farm

in the region of Jämtland on Sami herding lands, and against the will of the local residents, and procured all the electricity produced by the farm.

These controversies expose two things. First, while Big Tech imaginaries of futures with large language models presume the endless expansion of data and digital computing, power grid capacities are limited by the designs of transmission lines, and historically shaped cultural expectations of anticipated load. When Microsoft reserves local power grids for computing, or when Google buys all the available power of a wind farm, they push away other companies and business away, by simply limiting the available grid capacities to everyone, perpetuating what we term as energy gentrification (Libertson et al., 2021). With increasing energy gentrification, public values of universal and equal access to electricity in Sweden that have been core to the Swedish welfare state are getting lost, resulting in unequal opportunities to local communities and industries for access to electricity provision. The culture of secrecy practiced by the digital and energy infrastructure operators in Sweden stands against long-standing regional values of publicness and makes it impossible to assess the scale of these developments. They get to be known primarily by the visible controversies around lack of grid capacities and lack of "green" electricity. Together, these practices dismantle infrastructurally Nordic public values of openness, public knowledge and equal, affordable access to energy. And, these values cannot be quickly nor easily restored because electricity grids take decades to build.

Second, the controversies also expose how data giants' energetic needs perpetuate conflicts between citizens, local businesses and the Nordic states. Google's wind farm in Jämtland has been subject of national and international court cases and activist campaigns over land conflicts between reindeer herding, local industrial development and wind power. While Google takes all the energy from the wind power plant, they also perpetuate unresolved disputes between the Swedish state and Sami people over land, furthering old practices of internal colonialism – this time not solely for the benefit of the Swedish state, but also for the needs of Google and the global computation economy.

What I ultimately show in this paper is how the new geographies of digital computation that technologies such as communicative AI require profoundly impact public values, and perpetuate social inequalities through the infrastructure politics of access to and distribution of energy. As digital industries, governments and scholars are imagining computation-intense futures, it is vital to conceive of these futures through thicker accounts of the relation between digital computing and energy politics. What is at stake is nothing less than the liveable futures of societies organized around computation.

References

Akrich M (1997) The De-scription of Technical Objects. In: Bijker WE and Law J (eds) Shaping Technologies/ Building Society. Cambridge: MIT Press, pp. 205–224.

Crawford K (2021) Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence. New Haven: Yale University Press.

Libertson F, Velkova J and Palm J (2021) Data-center infrastructure and energy gentrification: perspectives from Sweden. Sustainability: Science, Practice and Policy 17(1): 153–162.

Ortar Natalie, Taylor ARE, Velkova J, et al. (2023) Powering 'smart' futures: data centres and the energy politics of digitalisation. In: Abram S, Waltorp K, Ortar Nathalie, et al. (eds) Energy Futures: Anthropocene Challenges, Emerging Technologies and Everyday Life. De Gruyter contemporary social sciences 10. Berlin; Boston: De Gruyter.
Parks L, Velkova J and De Ridder S (eds) (2023) Media Backends: Digital Infrastructures and Sociotechnical Relations. Urbana: University of Illinois Press.
Pasek A, Lin CK, Cooper ZGT, et al. (2023) Digital Energetics. In search of media. Minneapolis: Meson Press: University of Minnesota Press.

BEYOND EXTRACTIONISM AND EXISTENTIALISM: AN ECO POLITICAL ECONOMY OF COMMUNICATIVE AI

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Amidst the whirlwind of media attention surrounding the rise of communicative AI, leading Digital Lords (Brevini 2020a) such as Microsoft and Google have finally openly acknowledged the hefty environmental toll associated with meeting the soaring demand for their AI tools. This toll includes the expensive production of semiconductors, the massive energy consumption, and an unprecedented strain on water resources (George et al. 2023; Heikka 2023). Microsoft's latest environmental report, released in 2022, unveils a notable 34% surge in its global water usage from 2021 to 2022, totalling nearly 1.7 billion gallons. This substantial increase is directly attributed to the company's intensified AI research endeavours with OpenAI, presenting a heightened environmental concern compared to previous years. Despite growing attention to the environmental costs of ICT systems (Ferreboeuf 2019) AI gets principally heralded as the key technology to solve contemporary challenges, including the climate crisis, which is one of the goals of sustainable development. Remarkably, despite a substantial body of evidence, there exists no unanimously accepted conceptual framework or a standard set of guidelines for comprehending the complexity of the ecological harms generated by communicative AI (Brevini 2020, 2021, 2023a). On one side, there is a recognition of the extensive benefits of communicative AI, while on the other, there's a disciplinary and topical divide in the scholarship related to digital technologies, communicative AI and the environment. Engineering and computer science scholarship remains detached from investigations into political economy and the social dimensions of technology. Research on environmental communication operates independently from studies in geography. This academic compartmentalisation poses a barrier to effectively addressing these pressing challenges.

A crucial systematic evidence-review of literature on environmental sustainability and digital communication conducted by Kuntsman and Rattle (2019) revealed that scholars engaging with sustainability and digital technologies, while acknowledging environmental concerns such as e-waste and energy consumption, the literature generally advocates for improving digital solutions rather than rejecting them outright. Specifically, their analysis highlights a "paradigmatic myopia", where various environmental blind spots persist despite some acknowledgment and mitigation efforts (ibid).

In the field of media and communication there are noteworthy contributions including Sean Cubitt's 2016 concept of "finite media" that brings attention to the finite nature of material resources required for, and subsequently depleted by, digital media; Richard Maxwell and Toby Miller's pioneering work "Greening the Media" (2012) pushing for the development of "eco-ethics" in media studies (Brevini and Murdock 2017), exploring the intricate relationship between communication and "carbon capitalism." Notable are the efforts of "data centers studies" recently focused on extensive carbon and extractive footprints of data infrastructures, with a focus on communicative AI's characterization as an extractive technology (Hogan, 2021, Brodie,2023). In the field of "Critical AI studies" (Lindgren, 2023; Verdegem, 2021), a significant focus revolves around the concern for bias, encompassing issues of race and gender discrimination, exclusion, oppression and "existential threat" brought by AI systems (Broussard 2023; Eubanks 2018; Noble 2018).

Engineering studies played a pivotal role in advancing the field of communicative AI by providing the technical foundation and methodologies for the development and implementation of AI systems. They have also been delivering the most promising research engaging with the environmental toll of AI and its energy consumption. The most pioneering study in the field that connected AI with its environmental costs was published in June 2019 by Strubell, E., Ganesh A., McCallum at the College of Information and Computer Sciences at the University of Massachusetts Amherst. For the first time, research sought to quantify the energy consumed by running AI programs. Moreover, recent studies focusing on ChatGPT have highlighted the urgency of recognizing the massive water footprint caused by AI models (George et al. 2023; Heikka 2023; Microsoft 2022; Dryer 2020).

Existing research predominantly fixates on isolated environmental footprints and a limited number of studies, highlighting the need for more comprehensive research to ascertain the reliability and validity of such findings (van Wynsberghe, 2021). Expanding upon the groundwork laid by Henderson et al., Anthony et al. (2020) introduced "carbontracker" as a novel tool designed for monitoring and predicting the energy consumption and carbon emissions associated with training deep learning models (ibid). Notably, the "carbontracker" not only enables the generation of carbon impact statements but also provides a unique feature allowing users to halt model training "at the user's discretion if the predicted environmental cost is exceeded. In more recent times, tools such as the 'machine learning emissions calculator' (Lacoste et al., 2019) have become increasingly accessible (Luccioni et al., 2023). However, these studies never engage with the complexity of AI global ecosystems and the overall ecological impact of AI. This conclusion aligns with the findings of the systematic review of engineering studies specifically addressing AI and ecological concerns conducted by Verdecchia et al (2023). The systematic review underscores a significant increase in engineering publications exploring topics such as Green Software, Green Applications, and Green Data Centers, with a substantial 76% of the papers emerging since 2020. However, it is noteworthy that the prevailing themes within these publications primarily revolve around monitoring, hyperparameter tuning, deployment, and model benchmarking (Verdecchia, 2023). Overall, scholarly work on Artificial Intelligence has not yet paid sufficient attention to the global ecosystem and production and supply chain dynamics associated with communicative AI, as well as to the challenge of providing a holistic analysis of the

resulting environmental harms. As a result, the potential impact of existing interventions, is significantly constrained.

To address these limitations, *AI Good for the Planet?* (2021) called for a novel approach, "an Eco-political economy of AI" as a framework to understand holistically the complexity of AI environmental harms by studying the global production and supply chain of communicative AI (Brevini 2021: 40; Brevini 2024). Embracing the tradition of the critical political economy of communications allows us to view communications systems as assemblages of material devices and infrastructures (Brevini and Murdock 2017). Moving beyond disciplinary constraints, this paper extends those effort by developing this framework further, by consolidating fragmented knowledge traditions, indigenous concepts, environmental justice paradigms, and theories spanning Media and Communication, geography, computing and engineering.

References

Brevini, B., & Murdock, G. (2017). Carbon capitalism and communication. Palgrave Macmillan.

Brevini, B. (2020). Black boxes, not Green: Mythologizing artificial intelligence and omitting the environment. Big Data & Society, 7(2)

Brevini, B. (2021). Is AI good for the planet. Cambridge: Polity.

Cubitt, S. (2016). Finite Media: Environmental Implications of Digital Technologies. Duke University Press.

Kuntsman, A., & Rattle, I. (2019). Towards a paradigmatic shift in sustainability studies: A systematic review of peer reviewed literature and future agenda setting to consider environmental (Un) sustainability of digital communication. Environmental Communication, 13(5), 567-581 Ferreboeuf, H. (2019). Lean ICT: Towards Digital Sobriety. Paris, France: The Shift Project. https://theshiftproject.org/wp-content/uploads/2019/03/Lean-ICT-Report_The-Shift-Project_2019.pdf.

George, A. S., George, H., & Gabrio Martin, A. S. (2023). The Environmental Impact of AI: A Case Study of Water Consumption by Chat GPT. Partners Universal International Innovation Journal, 1(2), 97–104.

Heikka, M.(2023) Making an Image with generative AI uses as much energy as charging your phone, available at https://www.technologyreview.com/2023/12/01/1084189/making-an-image-with-generative-ai-uses-as-much-energy-as-charging-your-phone/

Hogan M.(2021) The data center industrial complex. In: JueMand Ruiz R (eds) Saturation: An Elemental Politics. Durham, NC: Duke University Press, 283–305.

Lacoste, A., Luccioni, A., Schmidt, V., & Dandres, T. (2019). Quantifying the carbon emissions of machine learning. arXiv preprint arXiv:1910.09700

Lindgren, S. (Ed.). (2023). Handbook of Critical Studies of Artificial Intelligence. Edward Elgar Publishing.

Luccioni, A. S., Viguier, S., & Ligozat, A. L. (2023). Estimating the carbon footprint of bloom, a 176b parameter language model. Journal of Machine Learning Research, 24(253), 1-15.

Maxwell, R., & Miller, T. (2012). Greening the media. Oxford University Press.

Microsoft (2022) Microsoft Environmental Sustainability Report, 2022 available at https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RW15mgm
Verdegem, P. (ed.) 2021. AI for Everyone?: Critical Perspectives. London: University of Westminster Press
Strubell, E., A. Ganesh, and A. McCallum. 2019. "Energy and policy considerations for deep learning in NLP". Cornell University, arXiv:1906.02243.
van Wynsberghe, A. (2020). Designing robots for care: Care cantered value-sensitive design. In Machine ethics and robot ethics (pp. 185-211). Routledge.