Towards a Sociology of Machines: Reimagining Human-Machine Relations

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ABSTRACT

Towards a Sociology of Machines: Reimagining Human-Machine Relations

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The dissertation proposes the outlines of a sociology of machines for understanding human-machine relations, especially those that exceed the dominant normative frameworks. Bringing together social theory, artificial intelligence research, and human-machine interaction literature, the dissertation argues for the need to devote attention to alternative realities with technologies from a sociological perspective. This move serves as a critique of the dominant manner in which technologies are thought with, which is as means to the demands of an instrumental rationality. In the face of threats to other forms of life and relationality, the thesis insists on doing things otherwise, including sociological conduct itself. The thesis proposes using creative methodologies such as research-creation as a way to reinvigorate sociology to develop its capacity to address the multiplicity of human machine relations.

The thesis centers on machines that cannot be easily sublimated under frameworks of instrumentality, control, and management. It looks at relations with useless machines, broken machines, or machines that are treated as legitimate social actors. This allows the outlines of a theory to emerge based on the recognition of multiplicity of machines as well as humans. Thus, while establishing itself on an alternative ontology that takes seriously the contributions of other-than-humans in constitution of social reality, it also moves beyond the view that machines simply extend the logic of the contemporary power structures.

The thesis addresses these questions first by interrogating the conception of agency at the intersection of George Herbert Mead's and Alan Turing's thought. Secondly, it investigates the intimate relations developed with social robots to understand the development of different sensibilities in humans. Then it inquires into generative models to better gauge the necessary transformation of our conceptions of agency. Finally, a diagnosis is made through Heidegger's thought on technology to grasp the essence of technology, and a pathway is deduced for a sociology of machines that employs lively methodologies to make sense of the contemporary moment of machinic socialities.

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CONTRIBUTION OF AUTHORS

This manuscript submission includes work I have co-authored with my collaborator Joseph Thibodeau. The chapter “Socially Robotic: Making Useless Machines” was published in 2022 by the journal AI & Society. As the lead author, I have conducted the literature reviews, the analysis, argumentation, and undertook the majority of the writing. Thibodeau, as the designer and maker of the robots that are subject of this article, wrote the section on Machine Ménagerie, which explains the motivations as well as the technical details of the project; and he has done the final edits to the text. Thibodeau, in addition to his expertise in robotics, also contributed by conducting interviews, and providing reflections through his own ethnographic lens.

Co-author reviewed the final manuscript and approved of the contents.

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Introduction

> "[T]he last forty years have been about the exorcising of "the spectre of a world which could be free"... Instead of seeking to overcome capital, we should focus on what capital must always obstruct: the collective capacity to produce, care and enjoy."
>
> Mark Fisher, 2016

Today we live our lives to the hum of machines. Every now and then this hum crystallizes in some form: the steam engine, the assembly line, or computational beings as instruments of control, centering the power of classification and sorting operations to a handful of elite, imposing and distributing the logic of their contexts of production to their contexts of use. We hear the machines sorting a mass of people to the extent that they can reduce their reality to information. It is the subject of this dissertation, to think through this magnifying mirror that stands before us: collections of representations of relations, discourses, and (massively) multiple realities, statistically weighed together in a simulation that produces truth statements, and brings together collectivities into asymmetries that themselves are reflected in this magnifying mirror, which is so infinitely complex that a better term to refer to it would perhaps be simulacra. When we try and unveil this hum, we encounter a landscape so entrapped under relations of control and domination, the figure of the machine almost exclusively embodies the existential fears of the contemporary moment. Life with machines is described through images of bodies bending and submitting to the relentless and thoroughly engineered tempo, anxieties about machines that learn and adapt to our rhythms by extracting data and processing them, combining massive amounts of human and computational power; visions of machinic intelligences that cannot but further entrench existing power relations. In this landscape of relations, many core conceptions of sociology is disturbed.

No surprise, as the world itself seems to be disturbed. Acknowledging the hyperreality that threatens to become the desert of the real, in this work we will try and glimpse through the dimensions of these simulations what we can conceive. We will try to invoke an awe to resource our creativity, and return the mystical to the technical. We will try to rehabilitate our relationship with machines, and find a position for sociology in a quest to conceive an antidote to the perils of technology.

The story of machines thus far has been about their instrumental function, their efficiency, and their capacity for magnifying the control and influence of institutions over human conduct. Their history features an evolution from simple tools to complex technological systems. Machines have been a focal point in the criticism of dehumanization, social inequality, loss of craftsmanship, alienation, isolation, and environmental destruction that modernity has brought upon human societies. Interestingly, sociology's roots also go back to wider dissemination and inclusion of machinery into the fabric of societies; however, sociology's focus has been on the human, while machines have worked in the background, conditioning the possibility of interdependence and the supposed transformation of social organization from traditional communities to modern societies. Now it seems sociology is unable to grasp the reality in which it finds itself: the death of the subject, the decentering of the human, and a massive technologization of almost all aspects of life. Some call this the end of sociology: If all of society's relations are determined by machines, the conceptions of the social will become redundant and ultimately disappear. Yet, there remains an impulse to transform the discipline rather than give in and let go in the face of all the challenges (Borch, 2022). This thesis is devoted to this impulse; it grapples with a different reality of machines—one that does not necessarily find mainstream support—and does so from a deeply sociological perspective.

Machines are easily imagined to be related to work, and so to instrumentality, power, and control. In fact, the "myth" of the machine has been about a complex set of cultural beliefs, values, and assumptions that have shaped and perpetuated the dominance of mechanization, technology, and large-scale institutions in modern society (Mumford, 1970). It seems machines have been accomplices in technological determinism, the centralization of power, the dominance of technocracy, and a teleological notion of growth. Today, however, another narrative seems to be growing as machines become more diffused in humans' everyday lives. As they enter arenas they had not before, machines are leaving behind their tool-like appearance and opening up to become something more. This "something more," perhaps an excess that might reorganize society in ways that do not fit with the regime of power which has defined machines for centuries, is what I tackle in this study. I devote my attention to the emergence of this novelty by encountering machines in creative and artistic contexts throughout the dissertation.

The central thesis of this work emerges around the question of machines and how their inclusion in the social fabric alters mainstream sociological conceptions. My main motivation here is to restore the notion of the social, which seems to be lost in the ever-technologized nature of contemporary societies and in social sciences that deal with other-than-humans. Ultimately, this is a conceptual exercise that articulates a notion of society that includes other-than-humans, and I use machines as a case for that argument. Indeed, my work aspires to be a case for doing sociology otherwise, where the central character is an image not of the human, but of the machine. By establishing the conception of the "social" on human and nonhuman relations, the overall argument contributes to a decentering of the human from sociological thought. This decentering is crucial for the present, as boundaries between social and technical, nature and culture, and humans and

others become blurry; it is perhaps also an antidote to the colonialist, capitalist, and patriarchal formulations of the human which have pervaded the discipline since its conception.

The collection of articles and chapters in this dissertation collectively present a sociology of machines which deals with the intertwined nature of human and machine socialities through creative methodologies. What differentiates this project from others that deal with questions of technology is that it adopts a critical standpoint with a creative impulse. I present here an alternative to traditional sociological conduct and aim to carve a space in which machines in general and Artificial Intelligence (AI) / Machine Learning (ML) in particular can be thought of not solely as accelerators of dominant structures of power, but also as potentials for a different social world. In fact, I aim to show how a playful and creative approach can open up ways of thinking that move beyond the constricting essence that technology has come to embody in modern times.

Research Questions

The main question that connects all the articles in this thesis is this: How can sociology transformatively address the increasingly technologized nature of contemporary reality? The related questions are as follows: How can sociological conduct flourish in the decentering of the human? How can one think of a free relationship in technological realities? How can sociology play a role in the conception of free relations under hegemonic forces? How is the notion of agency transformed in the context of human–machine relations? Finally, how can creative methodologies contribute to a new way of doing sociology? These questions provide the framework for the overall aim of the thesis: presenting a sociology of machines as a living practice that takes seriously human–machine relations; centers on the inseparability and intimate entanglement of humans and

machines in the contemporary world; and makes space for the emergence of novel relations as a way to engage with social change from a phenomenological perspective.

The question of free relations comes from my reading of Martin Heidegger's later explorations on the essence of technology. In our contemporary moment that predominantly produces technologies—particularly AI technologies—as pathways to control, oppression and marginalization (Noble, 2018; Benjamin, 2019; Pasquale, 2016), in search for an antidote to the constricting landscape of a "control society" (Deleuze, 1992), I found Heidegger's discussion on freedom to be instructive. Freedom can be a counterbalance to the dominant framework of human-machine relations, and facilitate a ground for the emergence of new meanings. This relationship between the essence of technology and freedom will be examined deeply in the final chapter.

I am mainly interested in how conceptions of the social can be reorganized so as to contend with the scope of experiences that fall under human–machine relations. In the course of my research, it became apparent that the conception of the "social" is troubled because of the peculiar manner in which technology is currently being revealed. The artificial intelligence in our world largely seems to be "corporate intelligence," which renders technology subservient to hegemonic forces that organize societies. This is because the context of production of most common technologies are the corporations themselves, the cultures of which leak into the very make-up of such technologies. However, this is not the only story—and definitely not the final one. My focus on experience at the intersection of art and technology allows me to identify those phenomena that do not make sense under the current regime of technology. I take these cases as a way to forge a different way of interacting with machines, and by focusing on these marginal accounts, I excavate relations that do not take their dominant force from a corporate/government/military backdrop. In order to achieve this, I take seriously building interactions with machine others, and for that, I turn

to creative methodologies in my inquiry. I use research-creation as a way to circumvent the corporate structures that overdetermine the meaning of human-machine interactions. By bridging sociological thinking with an embedded and creative approach, I hope to reveal not only the reality, but also the potential of a different landscape of relations. Ultimately, I conceptualize a living sociology that is driven by the search for a free relationship with machines.

Statement of the Problem

This section contains an overarching discussion that identifies the central problem of the dissertation. The main thrust of this 5-year project, which culminated in the idea of a sociology of machines, was founded on the quest to find alternative relations and different interactions with machines. This rather intellectual search emerged as a response to the modern character of technology, which manifests as an instrument for control and management. Martin Heidegger (1977), in his "Question Concerning Technology," makes a famous observation on this particular point: Technology comes to be a means to an end, constricted to such relations, and reveals all beings (nature and humans) as a standing reserve to the demands of such instrumental rationality. This statement paints a rather murky picture, because all other forms of thought and action which do not show this character become occluded and appear as impossibilities, if not foolery. One finds herself enveloped in an Iron Cage (Weber, 2014), unable to escape the clutches of the dark consequences of Enlightenment (Horkheimer and Adorno, 2002).

However, in the face of such threats to other forms of life and relationality, one must insist on doing things otherwise. Rather than giving into the flames of the critique, in this dissertation, I aimed to cultivate a different attitude; "not a flight into the conditions of possibility of a given matter of fact… but, rather, a multifarious inquiry" (Latour, 2004:245). Therefore, as a sociologist,

I explored forms of relations that cannot be explained away by the dominant logic of modern technology. I committed to a living sociology that finds itself not in the neat organization of the Stack (Bratton, 2017), but in playful and creative relations with machines. The mission here is twofold: (a) to open up a fundamental space in sociology to consider nonhumans and (b) to highlight the machines that exceed the bounds of a cybernetic rationality and carry the potential for a different kind of future with them. Therefore, the discussion in this dissertation is directed at both sociologists, to help them examine their methodological exclusions of machinic entities, and technologists, to help them see that there are different ways of making technologies and that palpable threads and trends emerge outside of corporate contexts.

Below, I make the case that including machines in social thought is not only necessary, but also prudent for rethinking sociology's main tenets.

Machines at the center of social thought

My particular focus on machines is instigated by the critique of humanism that has pervaded the social sciences. When the human is decentered, a whole realm of other beings is revealed. Especially when one does the work of such revealing from an urban context, as is the case here, one encounters machines as entities that contribute so much to the rhythms and spaces of modern social life. This stance could be a hard-poised one for sociology, a discipline that defines its area of expertise as the conduct of humans. "Social" is commonly defined through the collective motion of humans. Indeed, the actor–network theory stems from the criticism of the categorical exclusion of nonhumans from discussions about human societies.[1] Bruno Latour (1992) made the

[1] While Latour insists on this position, it should be kept in mind that nonhumans were in fact part of social thought. The most obvious example is Marx's understanding of the capital, his deliberate and meticulous inclusion of machinery to his ideas as forces of production. The problem perhaps for Latour was that these visions of nonhumans took on a negative connotation, and were always considered to be integral to the motion of the capital.

case that nonhumans *are* constitutive of the social reality in which humans are said to have been residing exclusively. In this framework, objects appear in terms of their instrumental capacity—as materializations of social life and as things that make society durable (Latour, 1990; 2005). Nonhumans substitute for the negotiations and constructions of human relations; they replace humans in their functioning in networks. Latour's famous example of a lying policeman (or speed bump) is a case for this: The speed bump can be understood as a replacement for a human police officer who would otherwise regulate and enforce order in traffic (1992:166). Nonhumans replace humans and, within the confines of this theory, are better at sustaining social order than their human predecessors.

However, the problem with this kind of understanding of nonhumans in ANT is that it relies on the notion of the human, once again, as the ultimate signifier of social life. Nonhumans find a place in social life only to the extent that they can be enrolled by humans in their daily conduct. AI technologies, in the technological discourse, are built with a similar idea: to replace and be better than humans in many activities that are thought to be exclusively human arenas. Yet, the underlying argument of this project regarding sociology of machines is that these technologies are *not* mere placeholders or simple instruments of human conduct. Rather, I view machines as entities unto themselves, as beings in their own right; they are thought here to be constituting an internality that may remain obscure to the human gaze. Humans may not clearly know why a machine acts a certain way, or what in particular the machines respond to in the world. Their resistance to the assimilation of a knowing subject endows them with an alterity, an otherness, from their human interlocutors.

AI, in many respects, is a complicated phenomenon that encompasses many technologies, the foremost being its capacity to act differently from its programming. A computer, in Lady

Lovelace's (1842) famous explanation of Charles Babbage's analytical engine, "has no pretensions to originate anything. It can do *whatever we know how to order it* to perform" (italics in the original, quoted in Turing, 1950:446); which means that it cannot do anything "new." However, the basic argument behind artificial intelligence is that it *can* move beyond its programmed behavior and produce outputs that can be surprising to its programmer. In this sense, artificial intelligence is not a mere instrumental object, despite the attempts to enclose it as such.

This is an idea that permeates the chapters in this dissertation, that AI technologies are manifested in different roles that go beyond their tool-like conception. The leaking of the machine beyond the bounds of a utilitarian regime allows sociology to deal with these "objects" beyond their givenness and to creatively interrogate the myriad manners in which they come into being. Along the way, sociology gains the opportunity to transform itself (Borch, 2022).

By positing AI as part and parcel of social processes, one creates the possibility of conceptualizing these agents and the notion of society differently. In seeking out the multiplicities with and around AI, I attempt to open the way for thinking otherwise (Gunkel, 2010). The machine question (Gunkel, 2012) emerges from the irreducibility of the machine to other categories (such as human, animal, or tool); machines retain their machineness even in deep social entanglements. This idea forces one to consider that an insistence on humans as the main figure in the social world does not do justice to the new realities that are revealed in the contemporary moment. Stemming from this "thinking otherwise," this dissertation deals with creative projects and brings visibility to those practices that hardly find resonance in the popular and dominant discourse on technology. My research overwhelmingly deals with projects that consider the participation of machinic entities as legitimate social beings, and along the way, it glimpses a different kind of sociology.

Norbert Elias, famed as the last of the classical theorists, points sociologists toward seeing themselves as human beings among others: “For sociology is concerned with problems of society, and society is something formed by oneself and other people together, the person who studies and thinks about society is himself a member of it” (1978:13). Here, Elias is urging sociologists to overcome the illusion of separation and to make sense of societies through their embodied positions and their own relationalities. However, for Elias, as for many others, what counts as a legitimate other in defining one's social location is other humans. Therefore, for him and for others in the traditional vein, there is only one society that can interest sociologists: human society. The following chapters argue against this position. The idea of a sociology of machines stems from the motivation to reconsider sociology's categorizations and to open its lines of inquiry so that it can inhabit other stories that *are* integral parts of society.

The call for a sociology of machines is a call for considering societies not as static entities occupied with the usual suspects of class, gender, family, and communication, or as sui generis entities that emerge from a species-being. It rather regards the possibility of thinking about societies as just that: societies. What is called social is then construed as the simultaneous occurrence of relations among entities of all sorts. As Latour (1992) convincingly shows in his body of work, there is no human affair without nonhuman affairs. By making a case for a sociology of machines, I show how what is called a society is never contained within the boundaries of entities: There is never a human society, a dog society, a bird society, or a machine society. There are societies without prefixes, and the task of a social scientist is to uncover the mechanisms, describe the relations, and gather the stories so as to make sense of this form of the social.

This endeavor to conceptualize a society involving other than humans is necessary for a couple of reasons. The increasingly evident emphasis on understanding processes in a world that

is marked by the acceleration of transformations makes it very hard to pin down and enclose social relations within a certain limit. Instead, sociological imagination, the act of making connections between local troubles and societal issues (Mills, 1958), allows for an accounting of the simultaneity of stories "so far" (Massey, 2005). This is an opening for another way of doing sociology and for understanding the age-old problems within the discipline, the foremost being the definition of a society. The increasingly evident intertwinedness of natural and cultural processes (Latour, 1993) necessitates the sociological gaze to cultivate a conception of society that does not rely solely on humans, and to develop a vocabulary that can talk about other-than-humans as contributors to social life.

Implications of sociology's use of machines for sociology as a discipline

A sociology of machines does not fit the usual categories with which the discipline organizes itself: It is not like the sociology of work or the sociology of class, gender, ethnicity, and such. A sociology of machines assumes a different category that disturbs the alignment of these categories and the "usual" conduct of sociology. To the extent that it troubles such casual ways of work in sociology, it also opens the way for thinking about sociology differently. Discrete analytical topics such as gender and sexuality, theory and knowledge, politics, and technology are already interrelated, and thus the maintenance of their incommensurability only sediments further specialization and makes it harder to understand societies as multiplicities.

This is also a stance against the structure of the hierarchy of knowledge (Lee and Wallerstein, 2004). An anthropology of machines does not sound at all preposterous, as the anthropology discipline already grapples with things that are other than human or, more correctly,

things that are less than human and will never be human. The mythical creatures[2] of "primitive societies"—animals, design practices, food, objects—are all part of the usual conduct in anthropology. Yet, sociology retains its "seriousness" and enforces a distance from its pristinely humanistic objects of inquiry. In fact, this can be considered to be one of the initial ambitions that Alan Turing harbored in his formulation of artificial intelligence: initiation of the thinking machines into the human club by way of a human judge (Turing, 1950; Lestel, 2017). In accordance with such historical convergence, this project can be one of the ways in which sociology reconceptualizes itself and makes an effort to rethink its basic premises.

While this is a "disciplinary" call from the discipline and for the discipline, in effect, it disturbs the boundaries of the discipline, opens it up to the world in different ways, and thus has the potential to dethrone the "queen of social sciences" (Tickamyer, 2000). It disturbs the founding attitude, inherited from Comte, that there is only one social science—sociology—and locates it as a series of methodologies and theories always operating in relation to other disciplines within its reach. In this sense, this project also positions sociology in the larger transformation of universities and the production of academic knowledge, reflecting the increasingly interdisciplinary character of engaging with the social sciences (Klein, 1990). In this dissertation, I bring together sociology, human–machine interaction, and philosophy of mind on the basis of creative research methodologies. This is how I reach a conception of a living sociology that is able to transform itself by being-in-the-world.

[2] I'm emphasizing the cardinal and constitutive role Anthropology played in the colonization projects; and in legitimizing a supposed distinction between 'other' communities, and 'self' societies.

Sociology and AI: An old encounter

AI is not new to social thought, even if it does not necessarily appear as a palpable disruption or a challenge to the normative character of sociology. The idea of a "sociology of machines" was formulated as early as 1978 by Steve Woolgar. Indeed, the dissertation at hand owes its existence to Woolgar's discussions about the need to come to terms with the possibility of positing machines as a legitimate problem for sociology to tackle. Woolgar (1985) asks the question "why not a sociology of machines?" to provoke a discussion that would enable a rethinking of the foundational claim of sociology: that the social is a distinctly human category. His was a critical formulation that did not heed the "impact" studies that presume the social to be a separate avenue from technology or nature. Woolgar argued for a methodological shift that would call into question the assumed distinctiveness of the social from the technical. His argument unsettles the understanding that scientific or technological advances occur in a vacuum, devoid of interests or meanings. He elaborates on this point by providing an analysis of expert systems that exemplify how the AI enterprise actually feeds on the dualisms between the social and the natural, or the human and the machine. This point is obviously still relevant today. "Big" actors in AI mobilize the "human vs. machine" discourse to maintain their research agenda, and they make constant references to a future point where A(G)I[3] is finally realized, which guarantees them increasing funding (Ballatore and Natale, 2019). This is a point I also reach in my analysis of large language models in Chapter 5: A clean and singular conception of agency in machines or humans

[3] AGI refers to artificial general intelligence, which is a research ambition that seeks out human level intelligence in computational systems (Newell and Simon, 1976). This is a contested term, and is commonly regarded in the critical AI community to be a fantasy if not snake oil to divert capital into specific projects that benefit the elite of AI.

actually obscures the very conditions of possibility of such agency, which really rely on the multiplicity of human–machine socialities.

Woolgar also curiously raised the possibility of considering intelligent machines as participants in a sociological investigation through human–machine interaction: “this project would only strike us as bizarre to the extent that we are unwilling to grant human intelligence to intelligent machines” (1985:567). It is this stance that inspired the initial impulse of this dissertation. What this dissertation aims to embody through its cases and theoretical discussions is a dethroning of the (Western) human from the focus of the analytical gaze. A sociology of machines is possible only to the extent that one is willing to let go of a purely humanistic notion of the social. This act of ‘letting go’ is central as a methodological attitude here, which I will explore through Martin Heidegger’s ideas in Chapter 6.

Let me refer to other works in sociology which consider AI technologies. Alan Wolfe's (1991) “Mind, Self, Society, and Computer” is another early work that criticizes the perspectives in AI sciences through a reading of Mead's sociology of mind. His faithful reading of Mead leads to his argument that the human mind is distinct from the machine's mind because it has a social character; the mind should be regarded as extended into the social realm. AI, as an artificially constructed isolated entity that does not consider the social character of the human mind, is doomed and can never claim to be a rightful mind.

Wolfe points to the ambiguity and unknowability of the world as the primary sources for the mind's meaning-making activities. This idea was in stark contrast with the canon in AI sciences at that time, as the “world” in which AI agents act was rendered readable and *knowable* to the machines through symbolic systems designed by human coders. In Wolfe's formulation, this

unambiguous datascape from which AI conducts its activities actually bars its entry into the social realm. I would argue from the same position, but with different conclusions. The world rendered as data still exists in a continuum of social forces, and these forces are far from being straightforward, as they produce a mess every step of the way. From energy expenses to human costs, the data work itself is shrouded in mixed interests and multiplicities. Further, as I show in Chapter 3, by reading Mead and Turing together, one can actually come to a different conception of agency which opens up the lines of analysis rather than condemning it to rigid (and rather devastating) conclusions.

One instructive work that considers how AI can trouble our understanding of agency and related social action is Harry Collins's (1990) "Artificial Experts." Collins investigates expert systems, particularly how humans get replaced by intelligent computers. Expert systems were created with the idea of replacing human experts in information-intensive domains such as medicine and law. The idea is to extract knowledge from experts within a domain and code it into a program. Thus, an expert system can, for instance, prescribe medicines to patients who submit their symptoms and complaints to such a computational system. The very promise of expert systems is to automate expertise and expand its purview. However, machines being machines, they are prone to failure and susceptible to malfunction, and therefore they cannot necessarily autonomously operate in the world. While this destabilizes what expertise knowledge aims to achieve in the world (e.g. analysis of the world into a uniform order), it also points to the necessary entanglement of humans and machines.

One of the important insights of Collins's work is that "the humans compensate for the deficiencies of artifacts in such a way that the social group continues to function as before" (ibid:215). This means that humans willingly mobilize cultural codes or engage in actions to

compensate for the gaps and errors that computers commit in their functioning. This insight creates an interesting opening for the social sciences to intervene and make sense of human–computer interactions. These systems, because of their close connection to humans, in terms of both replacing them and also cooperating with them in decision-making processes, spark interesting questions about common-sense knowledge and mutual intelligibility.

Common-Sense Machines

Let me zoom in on the problem of common sense and how it is considered in AI sciences as opposed to social thought. The argument in sociology of knowledge, inherited from phenomenology of Husserl, has been that the common-sense world, or lifeworld (Schutz and Luckmann, 1973), is constructed intersubjectively to objectivize everyday knowledge that is necessary to function in the world. It refers to assumptions that are unquestioned, routinized, and sedimented in the flow of everyday life (Berger and Luckmann, 1966). It is the background understanding that people in a society share about the world, and it forms the basis for their interactions and interpretations of reality. The common-sense assumptions provide the context upon which explicit forms of knowledge can be built. Some AI practitioners and scientists have also tackled the common-sense problem, but without making the necessary distinction between tacit and explicit forms of knowledge.

If we follow Berger and Luckmann's formulation of social construction of reality, common-sense can be conceptualized as knowledge that is taken for granted, and thus located in the realm of the unconscious. In AI, however, common-sense emerges as a kind of problem tackled in efforts to codify it. One of the "founders" of AI, John McCarthy (1984), posited the problem of AI as lacking common-sense knowledge, which was why these systems were brittle and unable to function dynamically. McCarthy's pupil Douglas Lenat made it his career's mission to use

common-sense knowledge as a way to solve this problem, and he has spent considerable funds and research on his project "Cyc," which aims to codify the common-sense world (Lenat et al., 1985). Cyc today is advertised as "logic-based machine reasoning" that has an awareness of context. This 39-year-old project, it seems, had to pivot away from a direct focus on common sense and diversify its operations. From a sociological perspective, it is not surprising that common sense cannot be exhaustively codified.

This paradoxical problem is pointed out by Harry Collins: "One of the ironic implications of the development of computers is that the things we once thought of as the preserve of very clever people have turned out to be relatively easy to mechanize whereas everything else is very hard" (1990:110). While teaching a computer how to play chess proved to be a solvable problem, creating properly conversational service bots took almost 40 more years. Collins argued that while thinking about learning, one has to account for not only the algorithmic model of recipe-like instructions, but also an enculturational model in which learning or practice takes place. The manner in which learning occurs is usually through social interaction, which AI models do not commonly account for. The anthropologist Lucy Suchman (2007) points out how scripts and plans that frame the functioning of machines do not—and cannot—take into account the context in which the machines are acting. This, however, is not a limitation, but a gateway to consider the sociality that envelops machines.

Suchman highlights that machines always need a human in the loop to troubleshoot and do the contextual and adaptive work that machines are not equipped to handle (Suchman, 2007), because machines are not enculturated and socialized into the common-sense world in the same way humans are. Collins adds that "it is our cultural skills that enable us to make the world of concerted behavior" (1990:109). He abstracts culture as a realm that enables, and is enabled by,

intersubjectivity. Further, he certainly does not view machines as having a determining part in this cultural realm. Inherent in Collins', as well as Wolfe's, thinking is that the world of culture is solely a human landscape, and thus machines and others are banned from this "human club" (Lestel, 2017). In their thinking, humans and machines are hygienically separate and eternally opposed categories.

Sociology After AI

Moving beyond such approaches that pit humans against machines, let me turn to some other works that use AI or ML as a way to rethink the contemporary moment and try to grasp the kinds of challenges they pose to sociological categories. The first example I offer here is David Beer's 2017 study on the power of algorithms. Beer asserts that algorithmic power entails not only the impact of an algorithmic operation, but also the "powerful ways in which notions and ideas about the algorithm circulate through the social world" (Beer, 2017:2). Beer highlights the difficulty of appreciating the full scope of the object of study regarding algorithms, both because many aspects of these technologies still reside in what Nigel Thrift (2004) terms "technological unconscious" and because of the black-box nature of these technologies. Thus, one is dealing not only with "enigmatic technologies" (Pasquale, 2016), but also with an incommensurability that emerges in the perspectives of the social scientist and the designer/coder. This is because many aspects of algorithms, such as the scale or design principles, remain opaque to the observer. This discrepancy feeds further into the power of algorithms, as they are obfuscated behind paywalls, organizational structures, and complex infrastructures.

Anthropologist Nick Seaver has also commented on this disparity in perspectives between social scientists and designers or coders of algorithms. His discussion on algorithms *as* culture stresses that

> "this disparity does not mean one of us is wrong and the other right—rather, we are engaged in different projects with different goals, and just as my discipline's methods are poorly suited to determining the efficiency of an algorithm in asymptotic time, so the computer scientists are poorly suited to understanding the cultural situations in which algorithms are built and implemented." (Seaver, 2015:5)

Seaver takes an approach that appreciates the multiplicity that lies in algorithms and, from a grounded perspective, argues that social scientists and engineers alike engage in and construct an algorithm that is always a product of their practices. This perspective suggests that algorithms are multiple and are "enacted by the practices used to engage with them" (ibid). It recognizes that researchers are not merely detached observers, but rather agents who actively shape algorithms and their development through their research practices.

As a result, the methods one employs to study algorithms assume a heightened significance, as they contribute to the production of these technologies as particular types of objects. Seaver's account shows the limits of looking at the algorithm as a detached object and the merit of seeing it in process and in situ. This inseparability of social processes from machinic ones is also where David Beer inadvertently grounds his argument. The development of algorithms is inherently linked to particular perspectives of the social world; this has been extensively discussed in the literature, especially around the bias debate. Moreover, and as Beer emphasizes, algorithms are not static entities that exist apart from the social context in which they are produced; rather, they are *actively lived with and are intertwined with* various practices and outcomes in that social world.

New Questions for Sociology

The interdependence between algorithms and social practices further underscores the importance of analyzing and understanding the sociocultural dimensions that shape their creation and use. Beer proposes a Foucauldian approach to thinking about algorithmic power, namely, to understand algorithms in their relation to truth. Algorithms, he claims, have a capacity to produce truth in two ways: (a) through material interventions in domains such as taste, health, risk, and lifestyle and (b) through discursive interventions regarding algorithms—their "notional presence in discourse" (Beer, 2017:8). Surely, the algorithms produce, circulate, and legitimize certain truths, and moreover, they invoke notions of governmentality and a vision of order and rationality. Beer insists on attending to the discursive work that mediates the algorithms, because "the way that those systems are spoken about is part of how they are incorporated into social and organizational structures and a part of how their implicit logic spreads" (ibid:10). He brings into focus the way in which algorithms are discussed and mobilized in society and their agentiality in channeling a particular logic. In this view, we as sociologists should question how we discuss these machinic systems: What are our vocabularies?

Another interesting work that sparks new questions is that of Marion Fourcade and Fleur Jones (2020). They propose that the cumulative effects of social and machine learning have contributed to a growing hunger for data and an intensified desire to continually search for more—what they refer to as "loops." Through these loops, new forms of stratification and association emerge, which are termed "ladders" and "links," respectively. Fourcade and Jones base their argument by conceptualizing socialization as the process of mediation that underlies "social learning." They are interested in the intersection where social and machine learning processes interact and "share certain tendencies and dependencies" (Fourcade and Jones, 2020:807).

Fourcade and Jones show two aspects of a reality that is socially and mechanistically constituted: data hunger and the accretive making of meaning. The first is interesting in that it emphasizes the natural attitude of a data hunger system, which is "searching": a mode that is reinforced through feedback mechanisms inherent in these systems. Relevant here is the quantified self-movement (Wolf, 2011), where people adorn themselves with sensory devices to turn information from their bodies into actionable data. The "learning" in the system involves learning the rhythms and intervals of a human life; and the learning in the human is the control and goal-oriented use of a stream of information for a larger quest for optimization (of life). Aside from the implications of this for culture (Singer, 2011), one is also then forced to think about what kinds of avenues of action are rendered possible, or even created, under systems of datafication.

Fourcade and Jones continue their argument that these interactions between individuals and machine learning systems have resulted in new challenges and opportunities, reflecting a heightened level of competition and dependence on data production, further entrenching machine-learned stratification. They parse a large territory by covering sociomachinic learning and the exclusions and discriminations that occur at these interstices. In their process of "reassembling the machine," however, they mainly focus on social media as an object. This focus is fair, because social media is the main and most common way in which humans get involved in data analytics. However, I would argue that interactive systems themselves merit investigation here in an attempt at "reassembling the machine." Sociology in general can refer to the literature on human–computer interaction to collect observations on a larger scale of variation. Fourcade and Jones conclude with a call to rethink and reconsider questions about how to live and act together, at the very intersection of social and machine learning. I agree and share this position in thinking about the ways in which

humans and machines “hang together” (Berger and Luckmann, 1966:81)—and while doing so, I do not want to exclude the micro-substantia that constitute human–machine socialities.

Challenges to Sociology

A final idea one should consider when thinking about how sociology can be transformed by machine learning is Christian Borch's recent incursion. Borch (2023) shows how a clean conception of human agency is not tenable in the contemporary social landscape, and he treats this as an opportunity to take seriously the criticisms raised in the works on machine learning and postcolonial critique. Machine learning processes rely on the processing of data based on programming and the creation of outputs based on a predictive model. Machine learning's reliance on data-driven models challenges the idea of human agency as the sole arbiter of (social) action. Instead, ML technologies bracket human decision-making and render it part of the system's development or functioning. Effectively, machine and human agencies are subsumed under the guise of a *model*.

The troubling of human agency poses complications for sociological theorization, as Borch shows, but is also a homologous challenge to the critique raised by postcolonial literature; as the said literature challenges the idea of a universal human subject by highlighting the ways in which colonialism violently shaped the experiences of people in the construction of a pure human category (Fanon, 1952 [2008]; Said, 1979; Spivak, 1988; Bhabha, 1994; Chakrabarty, 2000). The literature on postcoloniality, instead, argues for founding decolonized vocabularies that do not consider or see agency as an affordance of a sovereign Western subject. Borch convincingly argues that these two challenges are homologous in that they both challenge the idea of humans as autonomous agents; moreover, they both offer opportunities to reconceptualize human agency in more complex and nuanced ways. Borch's article shows, in a way, that the machine learning

critique complements the postcolonial critique in that they both problematize the centrality of a constructed notion of human and they both reveal, or direct the analytical gaze to consider, the multiplicities and differences that rest in the relationalities. I posit a sociology of machines on the basis of these challenges, and the chapters outline a work that necessarily positions itself away from a consideration of agency as an individualistic endeavor and toward a conception of it beyond individual actors.

The critique of humanism in sociology, or the social sciences in general, did not go unheeded. Borch rightfully turns to Actor-Network Theory or ANT as a way to respond to these challenges; I, too, have benefited from Latour's and Law's contributions to destabilizing a humanistic notion of agency. ANT is very useful in revealing the materialities that underlie phenomena, as well as the distribution of human agency (through delegating), across actor–networks with nonhuman (inter)actants. Indeed, ANT brings seemingly disparate processes to relevance by placing them on a horizontal network of relations that are stabilized through "obligatory passage points" and nonhuman actants. Latour (1994) famously proclaimed, "Technology is society made durable." This view entails an important break from mainstream sociology to consider the source of social order in something that, in modernist terms, is not social itself.

Latour mobilized the immutability of objects as crystallizations of human relations and considered the organization of networks as the source of stability in societies. My problem with this approach is that it still considers nonhumans in their affordances, in their disclosure in larger systems of actor–networks for the use of human agency—and not as entities in their own right which are, just like humans, mobilized to effect change in the systems they are embedded in. Latour's ideas enable sociology to find its missing masses (Latour, 2004), but indeed, it is an

undifferentiated mass of "nonhumans" that find themselves in a list of entities that are involved in a human endeavor. The next move here, especially if one considers these recursive technologies that themselves are sites of power and struggle, is to provide depth to "nonhumans" and, perhaps, even create a repertoire and inventory of machinic agencies.

Ultimately, sociologists find themselves on fertile ground for transforming the boundaries of the discipline to include entities other than humans and even moving them to the center of the sociological imagination. There are already threads in sociology and in the myriad criticisms directed at it which are seeds of a new form of thinking wherein the social world is viewed not as solely composed of human individuals, but as lines of connections that encompass ontologically variant agents. Instead of giving up on the concept of the social, I take a lesson from all these works and argue that the "social" persists even though "society" is transforming. The actors are changing, but contemporary entanglements and relationalities still define what society is about. There is a chance here for one to advance core sociological thinking without falling into a criticism that has run out of steam (Latour, 2002). My aim with this dissertation is to advance a position that appreciates human–machine socialities in their myriad forms without resorting to naive idealism. This aim requires seeing the territory of the machines as uncharted, yet to reveal itself, and expecting it to never do so fully. I concretize this position in the final chapter of the dissertation, invoking Heidegger's discussion on the essence of technology. For now, let me present an outline of the thesis.

Outline of the Thesis

The following is an outline of the chapters ahead. The second chapter locates the thesis in the related literature and establishes the methodological orientation of the study. This chapter

reviews the literature of everyday life and material culture studies, as well as new materialism, to establish the dissertation's context of operation. This literature allows us to reach at an intertwining of social and material realities, which provide a fertile ground for thinking about machines as not simply instrumentalized entities, but as already harboring forces of the social in which they are embedded. In the literature, the focus on everyday life and materiality has brought up many methodologically innovative approaches and discussions to social studies, which I take on by bringing in research-creation as a vital methodology. I seek out a "living sociology" (Back, 2012; Michael, 2012) which brings in a creative dimension to sociological methods so as to re-establish the ground of sociology. After I develop the methodological orientation, I present the projects that are analyzed in the chapters ahead: Machine Ménagerie, and Harvest of Signs. Both studies included machine collaborators, and playful and creative interactions that brought into sight an affective experience with machines. Finally, I legitimize my use of machines, and the particularity of sociology of machines before moving onto the analysis chapters.

Chapter 3 is titled "Machinic Encounters: A Relational Approach to the Sociology of AI." This chapter was published in the book "The Cultural Life of Machine Learning: An Incursion into Critical AI Studies", edited by Jonathan Roberge and Michael Castelle (2021). Here I deal concretely with the notion of the social and question how the sociological conception of the social is being transformed by the introduction of AI technologies in daily life. The chapter takes seriously the world-making implications of conceptions such as the social and intelligence and upholds a quest for finding alternative ontologies at the level of everyday life so as to expand the landscape of sociological thought. The chapter asks, "How would the everyday practice of sociological imagining shift if it incorporated machinic intelligences as social entities into its purview?" From there, it proposes the sociology of AI as a way to integrate this new sociological

imagination. This proposal comes from the premise that AI science never involved sociology as a discipline when thinking about the question of mind. This exclusion has arguably led to the conceptualization of the mind as an individual and isolated entity, which has had consequences for the way in which ideas about intelligence and sociality have been framed. Eschewing this individualizing approach, the chapter shows how uncertainty and indeterminacy are becoming central to computational theories and how they are reorganizing the way in which AI treats the intelligence question. It then moves on to show how AI technologies are not simply facilitators of capitalist structures, but also hold potential for contributing to concepts of social agency and novelty. To this end, the chapter looks at both Alan Turing's and George Herbert Mead's conceptions of novelty and makes claims about how to understand agency and, relatedly, the social. The chapter further argues for a collective notion of agency rather than the singular conceptions that have dominated the literature. It opens up the concept by emphasizing the processual nature of social action: "The notion of agency does not rely on the doer but on the doing in which different actors are constituted by their relationalities" (Yolgormez, 2020:156). I draw on a conceptualization of agency that deconstructs the primacy of humans in the ontologies of the social and brings forward a notion of machine intelligence as an interactive, dynamic agent with the capacity to invoke novelty in social reality. This uncoupling saves the "social" from being an exclusively human affair and brings into focus encounters between entities and their relationalities as a methodological orientation.

This chapter was an earlier attempt at determining how sociology could deal with AI technologies, which exceed the bounds of their rationalist makeup and expose new phenomena that sociology does not necessarily have the vocabulary to deal with. This early formulation then led to the idea of a sociology of machines. The reason for this change was mainly that the more I

discerned the technological landscape, the more I became convinced that my incursion was part of a larger question about technological relationalities. I chose the word "machine" because it implies movement and interdependence between different parts that make up a whole. The machine itself is an entity comprising different relations that constitute its materiality. This notion also gives me the ability to think about changing sociological conditions without getting wrapped up in the relatively narrow scope of what AI implies. The change in approach was a move to generalize my observations and also to indicate that machines themselves, and not simply AI, are becoming relevant to sociological analysis. Further, the motivation of this work comes from human–machine interaction (or human–computer interaction), and therefore it is more fitting to label the work under the rubric of machines. Finally, "machine" signifies a category of entities of which AI is only a subset. Therefore, the use of machines expands the analysis to include all sorts of entities that aggregate into social change.

Chapters 4 and 5 are based on participant observation and aim to theorize human–machine interactions from a relational perspective. Chapter 4, titled "Socially Robotic: making useless machines," was published as an article in the journal AI&Society. This chapter zooms in on the designer–machine relation and considers designing for machines as a way to destabilize the instrumental approach that dominates technological relations. This work is a collaborative effort with an engineer and artist, Zeph Thibodeau, and it is thus founded on an interdisciplinary research process. As the result of a research creation project called "Machine Ménagerie," the chapter elaborates on robots that are built to explore non-purposeful behavior in an attempt to break away from the assumptions of utility that underlie hegemonic human–machine interactions. Machine Ménagerie attempts to produce affective and playful machine entities that invite interaction, yet have no intention of serving human social or physical needs. The study diverges from other social

robotics research by creating machines that do not attempt to mimic human social behaviors. Indeed, these unruly robots necessarily go against the collective expectations of human–robot relations that take force from science fiction tropes that build on fantasies of control and dominance. The chapter explores these questions: How could we disturb the flow of hegemonic assumptions about human–machine sociality and create interactions between humans and machines which are meaningful outside of instrumental ends? Could we socialize differently with robots?

Thus, in addition to designing non-purposeful robots, the research also takes an approach that couples them with appropriate framing of interactions that would interrupt the flow of inbuilt assumptions and create the (social and discursive) conditions for the emergence of meanings that could not be exhausted by a simple instrumental framework. The discussion of these robots that found life in the wild by becoming collaborators in different projects highlights the cultivation of an attitude of "learning to be attuned." The possibility of breaking away from common-sense constructions about human–robot relations hinges on two notions: learning to be affected and being attuned. The design process itself provides a shared activity within which humans learn to be affected by the robots themselves. Learning to be affected creates new sensibilities, as well as sensitivities to other entities (Latour 2004). The latter, attunement, lets new meanings emerge in the process of sustained interactions. Attunement allows the relationship to be viewed as one of "tuning into the other," which realizes the machine question (Gunkel, 2012) in practice. The main conclusion of this chapter is that an instrumentalist approach emphasizes analyzing machines' inner workings and neglects the importance of relationships in shaping perceptions and sensitivities. In contrast, Machine Ménagerie shifts away from control and highlights the significance of relationships formed during robots' purposeless wanderings. The chapter also

acknowledges the designer's capacity to be influenced and attuned, leading to the creation of distinct sensitivities through these relationships. It concludes by making the goal of this kind of work salient: to shift the assumptions and attitudes of humans (hacking the social), rather than to make "better" robots (hacking the technology).

The fifth chapter builds on the latest and most controversial phenomena of large language models and crystallizes the outlines of a sociology of machines. This chapter is in the process of getting published in the upcoming "Oxford Handbook of Sociology of Machine Learning", edited by Christian Borch and Juan Pablo Pardo-Guerra. While the earlier case of Machine Ménagerie highlights an open design process and uniquely built machines, this chapter focuses on a preconceived machine learning model that is implemented by a technology company with a large user base. The main motivation of this chapter is to pose the question "Can we have a free relationship with machines?" and position the role of sociology in conceiving such a relationship. The chapter mainly develops an approach to understanding agency as a processual and collective achievement that includes human–machine socialities of different kinds. The discussion shows how traditional notions of agency that rest comfortably on the divides of human/machine or individual/society cannot grasp the phenomena around machine learning in their complexity. The chapter troubles the clean and stable form of the "model" of generative pretrained transformers and reveals how such clean articulations of agency on the side of the machine as a singular entity conceal the human–machine socialities that render possible the very emergence and existence of these models. The chapter stems from a view of technological and sociological processes as intertwined and entangled, which is a characteristic of the era of "deep mediatization" (Couldry and Hepp, 2016). It elaborates on these ideas on the basis of research on media coverage, technical reports, podcasts, and news stories about ChatGPT and related generative machine learning

models—as well as a series of participant observation occasions with GPT-3. This research highlights a methodology for a "living sociology" (Michael, 2012), where a researcher enmeshes herself into reality and suspend any allusion to a pregiven knowledge about the said reality. This enmeshment is made possible through introducing playfulness, which allows a way of enacting socialities that entail a reimagining of what is and what is possible. This point is emphasized by Heidegger's intellectual quest for a free relationship with technology, which is largely discussed in Chapter 6. In searching for a different meaning, which is yet another thread that connects the chapters together, Chapter 5 points to the troubling nature of representational thinking and follows a phenomenological starting point for a sociology of machines. It suggests, considering that machine agencies increasingly defy tool-like conceptions, that sociology can work with these "objects" which do not easily fall into a traditional or modern conception; moreover, sociology can make extensive space for considering these machines in a space of free play, in a conduct that is "sensitive to, and indeed actively seeks out, that which is empirically and practically nonsensical" (Michael, 2012:167). The chapter argues that a sociological conduct that considers phenomena in their figurations and is open to creative methodologies would be able to reveal the cultural moment in a way that leaves spaces for emergent phenomena that may not be cleanly articulated from the dominant mode of *being in the world*. Such a sociological conduct would establish itself on the newly crystallizing ontologies of an emerging landscape of relations that the contemporary moment increasingly makes its way into.

This brings us to the final chapter of the dissertation, which is a philosophical discussion to sow the seeds of a sociology of machines we gathered from the previous chapters. Chapter 6 deals with the notion of a free relationship with machines, which sparked the central motivation leading to the proposal for a sociology of machines. This chapter provides the main theoretical

avenue through which the dissertation finds its meaning. It makes clear the need for a different framework for human–machine sociality, one that breaks away from the already existing discourses and forms of human–machine interaction. The chapter mainly expounds on Heidegger's thoughts on technology to underline the need to engage with different forms of thought even in the face of a rising technological order. Exploring Heidegger's ideas lead me to phenomenology and experience, which provides a fitting framework for the research creation projects that ground the work at hand and the creative and playful methodologies I come to argue as the basis for a sociology of machines.

Mainly, the chapter explores these questions: If the modern technological experience is one of entrapment, how are other kinds of relations possible? Is there freedom to be experienced in a deeply mediatized world? In order to balance the paradigmatic condition in which technological experience emerges, the chapter considers the artistic, affective, and aesthetic dimensions of experience in order to restore a manner of relationality to such experience. Heidegger's thought first determines the essence of technology as a predetermined order of entities. He calls this form of ordering, specifically of an instrumental sort, "Gestell." In this sense, machines and technology are differentiated in that technology signifies the manner in which machines come to be used and experienced. Technology, in Heidegger's view, can be thought of as the ideology in which machines find themselves to be positioned and disposed; and Gestell shows itself as calculative thinking in the modern age. This is very dangerous, according to Heidegger, as calculative thinking modifies all manner of thought and traps existence in a particular or singular mode of revelation which, while presenting itself as revealing, actually conceals the multiplicity of the world.

Heidegger questions whether this calculative thinking is the true essence of technology and asserts that "freedom is the essence of truth" (Heidegger, 1943), which stands counter to the

restricting, entrapping, and enframing kind of relation that especially modern technology comes to cultivate. Heidegger finds freedom in an attitude of letting things be and conceptualizes such an attitude, or orientation, as "Gelassenheit." This is an intellectual path to a free relationship in that it releases the Being from its will to dominate, and in this path is a capacity to attribute meaning that is not given in the dominant relationalities. Heidegger would claim that this is the task of a thinker in the age of technology: to achieve an experience that is not given in the calculative thinking, not guided in a rigid manner, but one that defies such rigidity by its own insistence on making meaning through experience. This is what inspires and makes way for a sociology of machines that looks to meanings that cannot be sublimated under the dominant regime of relations framed as control societies or instrumental reasons. These meanings that leak from the multiplicity of the world can be grasped through phenomenology, which is also what methodologically orients the proposal for a sociology of machines. Reading together with calls for a living sociology, Heidegger's discussion makes space for an attitude that can glimpse a different manner of being together with machines, especially if one lets go of the instrumental rationality that dominates and obscures the essence of technology.

The thesis closes with an epilogue. This kind of an ending is not common in a thesis structure, but the nature of the work that is presented called for an ending without a strict conclusion. As the idea of sociology of machines became more crisp in Chapter 6, the epilogue makes a final note by addressing the work of Jean Baudrillard. I visited Baudrillard, because his body of work is how sociology came across the digitalization and computerization of contemporary life in a grand manner. In that sense, it seemed a necessary move to invoke his thoughts. Furthermore, I address Baudrillard to overcome his pessimistically fatalist perspective. Throughout the thesis, I bring forward experiences that do not necessarily feed into the dominant

narrative in which machines are made sense of. I open up a space in which to think of machines as playful collaborators. Therefore, without falling into the threat of disappearance of social, or futility of social theory raised by Baudrillard, the thesis closes on a note to joyfully embrace the possibility of different relations with machines.

Chapter 2: Methodology

Introduction: Sociology meets AI

In this chapter, I methodologically locate the project by referencing the literature that honed my particular approach to a sociology of machines. I explain how sociology can account for nonhumans in general and machines in particular by paying attention to everyday-level relations. It is also here that I make salient the need for a living sociology, especially if one is to expand the methodological toolkit of the discipline. The underlying methodological questions here are "What are objects of sociology?" and "How can one transform such objects in accordance with the changing social world?" Artificial intelligence provides a useful "boundary object" (Leigh Star and Griesemer, 1989) for sociology to attempt coming to terms with the technologization of the world. I commit to the pursuit of sociological questions in a technological landscape, and through this, I make a case for a living sociology that has the ability to deal with the breaking of the boundaries between natural and cultural, human and machine, and technological and social. To me, this presents an opportunity, not a death sentence, for the discipline. It is with this impetus that in this chapter I outline my approach to the study.

Before methodologically positioning the dissertation, I would like to briefly note sociology's and AI's common histories—that is, the work of classifying and categorizing the very social itself. Namely, using statistics and quantification of social life, one can only paint a picture of the world as a cold, rigid, crystallized body. Criticisms against the modernist image that sociology developed in especially the positivist and functionalist strands were founded on this inability of categories' reference to the flow of reality. Within AI, too, the lack of dynamism in these computational machines, especially in the symbolic reasoning paradigm, was thought to be

a hindrance to developing more sophisticated technologies. I tackle the problem in sociology by bringing play into research, in hopes that this magnanimous sociological picture taking and archiving activity can be countered and the scope of sociology enlivened while perhaps restoring imagination to the discipline. As revealed later, this thesis tries to show how sociological thinking does not have to abide by textuality and discursive analysis and can be inspired by the significance of the affectivity of machines. I was not after people's opinions about machines, but their experiences that constitute an everyday encounter with a machine.

There is an affective dimension in the micro-substantia that the hegemonic view cannot grasp: We look at our phones with sweat in our hands; we go to sleep with machines; we masturbate looking into digital images playing on our machines; some of my friends are saved by machines; and others are killed by machines. There is a myriad multiplicity that spills out of the clean labs and vampire gatherings in Silicon Valley, and yet the whole discourse and conversation is hijacked by the successes or downfalls of the military–academic–industrial complex that the AI story is reduced to. It is to resist this reduction that I formulate a sociology of machines which makes space for other kinds of stories. Its creative impulse allows phenomena to unfold in ways that do not fit into the dominant narrative around AI. Along the way, this sociology of machines calls to others who concern themselves with machines of all kinds with an anti-imperial, anticolonial, and anticapitalist impulse. In fact, in this sense, it allies with "posthumanist insurgencies" as proposed by Papadopoulos (2012).

This dissertation is the result of an embedded research practice spanning over five years. It includes work that was done in collaboration with engineers and artists and work that stands at the intersections of art/creative practice and AI. However, the ideas elaborated here were also motivated by larger discussions in AI/ML communities today. In this chapter, I position these

ideas; provide the methods used; and present the empirical projects that form the basis of the dissertation.

Everyday Life

The dissertation looks at human–machine socialities from the perspective of everyday life. This everyday focus methodologically creates a critique of modernist structures, all the while allowing a phenomenological approach that is central to my notion of a free relationship with machines (addressed in Chapters 5 and 6). This focus allows the work to create a ground for a different kind of sociology that deals with the less tangible and more ephemeral nature of social action and, alongside, cultivates a grounded critique of theories of rational action which underlie a modernist understanding of social reality. Especially when the focus is directed at microlevel relations, everyday life becomes an inescapable, yet intangible realm that is the site for the re/production of all things that are called social.

In the sociological tradition, everyday life has been treated from a wide range of perspectives. The common thread binding these perspectives is their micro-orientation toward the study of social phenomena. The main argument leveraged in microsociology, and its main contribution, is the reformulation of social actors as active entities. In the primary vein of macro perspectives, individuals are commonly regarded as being passively determined by the structures that organize societies through processes of internalization and reproduction. Instead, a micro-approach restores agency to these actors. This is significant for the work at hand, grappling with the ontologies of the social and the place of machines within sociological theorizing. Microsociology allows integrating other-than-humans into the analysis as they emerge in their nonrational, perhaps even affective, aspects in their relations. Furthermore, everyday life brings

experience forward as the locus of meaning. This aligns well with the project's goal of a sociology of machines.

Studies of everyday life reject the subject/object division that is maintained through idealized scientific procedures of objectification, detachment, value-neutrality, and control (Douglas, 1970). Instead, everyday sociologists have advocated for an integrated view of the world, which is achieved by focusing on the context of interactions between people in the everyday social world (Douglas, 1970; Adler and Adler, 1987; Garfinkel, 1967). The emphasis is on the naturally occurring interaction and not on the structurally determined social relations; thus, perceptions, feelings, and meanings constructed by the people and microstructures emerging from these processes come to the fore as phenomena for sociological study. Everyday life is envisioned as having sociabilities that can be thought of as "the play-form of association" (Simmel, as cited in Featherstone, 1992:174), where objective qualities of persons are put aside and the interaction is formed as if among equals without any obvious goal. What this dissertation adds to this equalizing methodology is recognition of the contributions of other-than-humans in general and machines in particular.

One could say that all sociology starts from the everyday, as social reality flows from the level of the everyday. The notion of everyday is at once instructive and ambiguous: It is the level at which all interactions take place, where large structures and institutions find their source, as well as the site for fluidity and potentiality that do not necessarily aggregate into an overarching rational social process. Everyday-life theories, especially in feminist work, embody a critique by virtue of choosing to deal with this level of reality. Modernity represses the appearance of difference or otherness by compartmentalizing the human experience into realities of "private" and "public." It is this division that underlies the tucking away of everyday life into the domain of the home and

leisure, whereas the outside and work emerge as places where social action takes place (Rose, 1993; Bondi and Domosh, 1998). This is why a critique of everyday life comprises finding those characteristics that were attributed to certain domains and not others. While, for instance, a Marxist understanding emphasizes the factory as the realm of production and as the foundation of a class structure, it also conceptualizes the public realm as the site of resistance; however, thinkers of everyday life (especially feminist theorists) claim and expose the resistances and empowering transformations that emerge within the "confines" of domestic spaces. Therefore, theories of everyday life highlight resistance to modernist logics of control and dominance, where subversion of commodification can be located in the nonlogical and imaginary (Gardiner, 2000:15). That being said, one should remember that it is precisely in everyday enactment that such logics themselves are pursued and reproduced. This ambivalent and ambiguous structure of the everyday is what makes it a prolific and problematic subject for sociological analysis. I follow the argument of everyday life being the "connective tissue" (Crawford, 2006) among the spheres of life; within the hopes for resistance to totalizing structures and despair for the inevitability of hegemony, the everyday emerges as a theoretical construct that encompasses every domain of reality.

Transforming Sociology through the everyday

It is this potential of the "everyday" to trouble dominant notions that this dissertation mobilizes. Focusing on the everyday level restores some meaning to the sociological conduct that the project for a sociology of machines aims to achieve. To explicate this, let me turn to feminist theory. As mentioned before, the focus on everyday life in feminist perspectives comes from a critique of modernity's imposition of difference between public and private spheres and the connotation of the former with masculinity, work, and production, while attributing femininity, domesticity, and reproduction to the latter (Hayden, 2000; Domosh and Seager, 2001). The

devastating and illuminating analyses put forward by feminist scholars have made it apparent how academia, even in, or especially in, the social sciences, has played a significant role in maintaining the status quo and feeding the inequalities that pervade social relations. Feminist sociologist Dorothy Smith's contribution is pertinent here: She shows sociology's role in complying with the "relations of ruling," since it studies social reality at a distance, removed from daily existence. She argues that the actual realities of people are markedly different from how sociology portrays them. Smith claims that a preoccupation with the everyday would reinscribe subjective realities into the analysis and make sociological analysis more real and politically viable. For her, the everyday world is "accomplished" by specific social actors through mundane but skilled practices. Bringing this focus into an analytical lens would expose "how people are knitted into the extended social relations of a contemporary capitalist economy and society" (Smith, 1987:110), while weaving the active subject into the picture.

This is indeed how this dissertation treats its subjects: not as duped humans who can only carry out the hegemonic forces under which technology is conceived. Instead, the work aims to reveal how, amid all the entrapments of technology, there are relationalities that cannot be reduced solely to the logics of a political economy. Furthermore, Smith makes a point about the structures within which a sociologist comes to see (and construct) the world. The knowledge producer must be aware of how their epistemological claims are bound to a joint construction of a shared everyday world. I locate the knowledge production activity itself as a potentially transformative affair and refuse to take an analytical distance from my subject. By embedding myself in the sites of creative production, I argue for a living sociology that takes seriously its commitments to reality construction and expands the ontological purview of the discipline. The everyday is a way of experiencing the world; "the process of becoming acclimatized to assumptions, behaviors, and

practices, which come to seem self-evident and taken for granted…the quotidian…is a lived relationship" (Felski, 2000:95). In this sense, the everyday world directs one's attention not just to the reproduction of social order, but also to how social change occurs. It is in this sense that I commit to everyday life as the site in which social change could be glimpsed. Approaching the "machine question" (Gunkel, 2012) from the level of the everyday allows the ontological concern of this dissertation to become tangible: Who and what inhabits the everyday? The following section focuses on how objects become legitimate subjects for sociological analysis.

Materiality in sociology

In this section, I explicate how one can treat objects appropriately through investigating how sociologists have rendered objects in social thought. I restrict my discussion to figures such as Peter L. Berger, Thomas Luckmann, and George Herbert Mead, alongside some ANT scholars and anthropologists. This section grounds the project in figures in sociological theory while establishing a basis that takes materiality and sociality as intertwined and entangled. My approach in this dissertation was informed by the questions raised by this tenet of socio-materiality. Naturally, a project that considers machinic entities as subjects of sociology has to deal with how to translate objects into social thought. This section reviews literatures relevant to this point.

Discussions about the place of objects in social thought mainly emerge in the social climate of knowledge society—complementary to consumer society—which allows, or even conditions, the rise of these object-related questions. Karin Knorr Cetina, in her 1997 article "Sociality with Objects," captures this shift in the thinking of the social from a concrete focus on human relations to an object-centered sociality. In her argument, this shift occurs in relation to the knowledge society, where "postsocial" developments such as the expansion of social policies, the welfare state, and the rise of the corporate form become dominant in the structuring of social contexts.

These developments entail a dispersion of knowledge processes, which brings about a reliance on objects of knowledge. By knowledge cultures or processes, she refers to the rise of expert culture instigated by the demise of communities that used to inform individuals' choices in following their life courses. Knowledge, with increased individualization, entered the picture in the form of experts to substitute for the retracting of communal ties.

For Knorr Cetina, postsocial transactions involve a flattening, narrowing, and thinning out of societal forms, a general retracting of the social under the spillage created by knowledge cultures. Yet, she does not make a nostalgic argument:

> "What I want to put forward against the scenario of simple "desocialization" is that the flattened structures, the narrowed principles, the thinned out social relations also coincide with, and to some degree may be propelled by, the expansion of "other" cultural elements and practices in contemporary life" (Knorr Cetina, 1997:6-7)

These cultures center on object worlds, and this is where one finds the rising interest in object-oriented ontologies or nonhuman-agency discussions finding ground. However, for Knorr Cetina, one of the problems with this form of sociality is that expert knowledge becomes a prerequisite for inhabiting these object worlds. Thus, in postsocial realities, people increasingly rely on knowledge practices, and individualization becomes intertwined with objectualization, by which she refers to an "increasing orientation toward objects as sources of the self, of relational intimacies, of shared subjectivity, and of social integration" (ibid:9). Against this background, she deals with "epistemic things" (Rheinberger, 1992, as cited in Knorr Cetina, 1997) and not technological objects—for the reasons of their complexity, mutability, and capacity for generating

questions. She uses the notion of sociality in addressing object–human relations so as to delineate the forms of grouping, binding, and mutuality or reflexivity (1997:15).

Sociality, in Knorr Cetina's argument and those of others (Maffesoli, 1989; Douglas, 1970; Mackenzie, 2006), appears as a significant operational concept that can adequately refer to the relationalities that cannot be termed "social" in the classic sense of the term. Especially in contexts of materiality, or object relations, the term finds credence; but more significantly, it is a concept that can signify the multiple, fragmented nature of social relations that are deemed to emerge in the context of everyday life. Objects find more space for the formulation of their materiality in this conception of relationality. Yet, one must remember that before this material turn, objects already did hold significance in social thought, albeit in strong relation to human selves.

Objects in Sociology

The criticism that sociology neglects objects and instead favors the "social" as a solely human phenomenon has found significant resonance. Especially science and technology studies, through Bruno Latour (1990, 1992, 2005), Michel Callon (1986), and John Law's (1999) development of the actor–network theory, have found their pertinence in the critique of sociology's exclusive approach to the study of the social. Their theory (or rather methodology) emerged under the paradigm of social constructionism and was thus timely, in the sense that social constructionism threatened knowledge practices with an overarching anthropocentrism, and ANT sought to balance this by (re)introducing nonhumans as a central tenet of sociological research. However, a question then arises: Were nonhumans really missing from social theory? There are many criticisms of ANT which claim that nonhumans were always already included in social understandings (Ingold, 2015; White, 2013). While these critiques are significant, the manner in which nonhumans are located in the methodologies proposed by ANT is very different from the

treatments of nonhumans found, for instance, in Marx's writings; and it is possible to trace a treatment of the physical world as a constituent of a social self, even in the writings of social constructionists such as Peter Berger, Thomas Luckmann, and George Herbert Mead. Let me show how these thinkers have considered objects in their approaches.

For Berger and Luckmann, the physical world is integral to how social reality is constructed. They are concerned with how reality constantly and imperatively imposes itself on its subjects and appears as an objective reality to the common sense of the individuals. Consequently, they show that objects themselves are constituents of different spheres of reality; in that sense, different objects impose (or present) different realities on consciousness. One would be exaggerating in suggesting that Berger and Luckmann were actually interested in the physical world or objects as constituents of social reality; their interest lay rather in understanding the consciousness and experience of the people who intersubjectively construct common-sense knowledge. However, there is a thread in their thinking about objects and the material world which allows them to elaborate on "multiple realities" (from Alfred Schutz). Indeed, they point to their inspiration as follows:

> "How is it possible that human activity should produce a world of things? In other words, an adequate understanding of the "reality sui generis" of society requires an inquiry into the manner in which this reality is constructed. This inquiry, we maintain, is the task of the sociology of knowledge" (Berger and Luckmann, 1966:30)

For Berger and Luckmann, how the physical world is maintained as such, with a Kantian impulse, pertains to the consciousness of the experiencing self. The world of objects constitutes the a priori structure into which the self enters and through which the self develops as a subject:

“The reality of everyday life appears already objectified, constituted by an order of objects that have been designated as objects before my appearance on the scene” (ibid:35). This is where Berger and Luckmann remain hard social constructionists, because they reduce the object world to the subjective experience of individuals.

Mead followed a similar path in that he considered objects in relation to the development of a social self. Doyle McCarthy's 1984 article focuses on the mission of uncovering how the physical world is maintained in Mead's understanding of social reality. Mead's writings were directed toward an understanding of the self in a society, and he thought of the human self not only in relation to other humans, but also in their capacity to view themselves as objects in the realm of their experiences, as well as in their relation to the physical world. He places more weight than Berger and Luckmann on his analysis of how objects function for the self, since he positions objects as the source of humans' sense of boundedness (Mead, 1932). In his supplementary essay to “The Philosophy of the Present,” he constructs an argument for the order of objects on the basis of the development of a child. For him, the surfaces of things give a sense of limitation to the body:

> “Without doubt surfaces in contact and organic experiences bounded by these surfaces are, in the experience of the infant, the experiences out of which the outsides and insides of things arise. However, the child can delimit his bodily surfaces only through things not his body, and he reaches the entire surfaces of things not his body before he reaches his own organism as a bounded thing.” (Mead, 1932:119)

This awareness of other beings having an “inside,” then, depends on contact with physical things. This contact allows the child to experience the resistance of the object; the physical thing pushes back against the grasping hand, and it is this resisting response that establishes the grounds

for a relationship to emerge between the self and the object in a cooperative manner. The child discovers that the inner resistance of the object is not a reflection or projection of the mind, but a property of the object itself. This is how the object establishes itself as a thing: only in relation to the self, which exerts an effort to construct a relation by extending the grasping hand. Thereof, the object gains the status of a being with an internality through cooperative action; and it is contact with things that constitutes the reality of things (McCarthy, 1984:219).

Thus, while objects have not necessarily emerged as agential entities in sociology's phenomenological and social constructionist lines, there is a latent thought here that one can trace. In Berger and Luckmann's conception, objects retain their objectness, in that they are what lay in front of a subject. This interpretation remains faithful to the origin of the word itself: *ob-iectum* means what lies in front (Yildirim, 2018), which is exactly how Berger and Luckmann use the word. Mead takes a more interactionist approach, as he considers how the object imposes itself on the development of the subject. Thus, sociology's treatment of objects in the classical canon remains in this capacity to provide a limitation and boundedness to a (knowing) subject. Its sister discipline, anthropology, adopts a different way of thinking about objects. This divergence, while a testament to the mercantilist roots of anthropological thought, has also provided fertile ground for thinking about objects. More pertinent to the thesis at hand, I am especially inspired by some of the more recent critical approaches in anthropology. In the next section, I examine in particular the work of Igor Kopytoff and Arjun Appadurai, whose approaches have directly influenced my empirical work—and object-oriented ontologies.

The Social Life of Things

One of the major ways in which objects have made their way into social thought is through their commodity form. The discussions of commodity fetishism springing from Marx formed one

of the ways in which object relations were considered in classical theory. In these formulations, the commodities were conceptualized as concealing the relations of production which brought them into being. Thus, fetishism directs attention toward the productive social relations surrounding the commodity form. Material culture scholarship, whereas, focuses on the cultures around objects of circulation, opening up explorations of other phases in the journey of an artifact. Here, I look at Arjun Appadurai and Igor Kopytoff's contributions, especially through the methodology their work suggests.

Appadurai (1986) introduces the volume "The Social Life of Things" with Simmel's (1900) famous formulation of economic value in his "Philosophy of Money," which suggests that the relationship between desire and demand conditions the manner in which things circulate; the latter work also brings together dimensions of production and consumption. The source of value is found in the act of exchange, which brings into analytical focus the interactions among actors that occur around objects themselves. Thus, in order to understand the historical circulation of things, one has to follow the things themselves and observe the meanings inscribed into them through the trajectories they take. One way of doing this is to make a biography of the things themselves. Igor Kopytoff, in the same volume, argues that things do not always manifest in their commodity form; in the life of a thing, it can gain or lose its commodity status, even multiple times. As they travel across different cultural regimes, things "experience" different phases of their lives, only one of which is the commodity phase. Thus, Kopytoff conceptualizes the commodity not as a given state, but as a process.

The idea of a "cultural biography of things" allowed me to deal with machinic beings not as abstract objects, but as living things that gather stories along the way. I was incited to ask in what other ways objects would reveal themselves, if not as material cultures or commodities. This

is the starting point of Holbraad, Henane, and Wastell's 2012 book, "Thinking Through Things," where they emphasize that things themselves condition their engagements in their own terms. More clearly, as anthropologists, they propose to take things as they are encountered in the field, as they present themselves, rather than immediately looking for what they refer to symbolically. They draw on cultural differences and suggest that the conceptions different cultures have of certain things "make" them into different things. Thus, if a powder is considered to be a power powder in a certain cultural milieu, then the anthropologist should not assume that power powder is an instantiation of the powder that they know from their own experiences and shared meanings, but rather view it as it presents itself: power powder.

This view entails that the discourses about an object do not create new representations of the object, but rather create a new object through the act of its enunciation. Thus, the authors Holbraad, Henane, and Wastell argue for a "radical constructivism," a term borrowed from Deleuze and Guattari (1994), in that they do not see an ontological distinction between discourse and reality—and thus collapse the difference between the concept of a thing and the thing itself. Thing, in this methodology, is being. Furthermore, the concept of a thing is not simply a cognitive or mental model of the thing; it rather highlights the mode through which reality is constituted. This idea suggests that a consideration of how conceptions come into being and through which relations they are constituted widens the possibility of encompassing the macrostructures that give way to the emergence of concepts about a thing. This methodology, they argue, paves the way for a nonrepresentational way of knowing to develop and thus is a critique of modern scientific practice (2012:26). This nonrepresentational knowing holds one of the cruxes of my methodology toward a sociology of machines: In searching for a free relationship with machines, one must not collapse their existence to their explanations or to their symbolic meanings, but rather, as

Heidegger put it, “meet them in the Open” (Keiling, 2019). I consider Heidegger's idea in the final chapter of this dissertation; it suffices to say for now that while I am not following a radical constructionist approach, I appreciate this opening for a nonrepresentational knowing in thinking through things.

Who can afford object-oriented ontologies?

One crucial point needs to be made at this juncture. In thinking through things, I am reminded that the metaphysics of things and the ability to speculate on things themselves do not occur in a vacuum. There is a who, where, and what behind the possibility of considering the internality and alterity of objects. There are particular structural conditions, histories, politics, and actor–networks that enable the very utterance of these questions: What is the experience of a thing? Who can afford to ask these questions, and where? Why does one want to know in full things that remain enigmatic to the inquiring mind? Can the mind penetrate into the object and know what *is* a thing? These questions bring me to the edges of colonization, the expansion of capital, and patriarchal social relations.

Furthermore, I am reminded of the intertwined histories of women and machines: It was at women's expense that a theory of value emerged in Marx's writings (Federici, 2004); it was through their exclusion that the Cartesian mind came to colonize rationality. Bringing together the questions of objects and everyday spaces, I think of things in domestic places and the thing-ness of women who were and are viewed in relation to home, to embodiment, and to the notion of the everyday itself. I am necessarily reminded of the relational ontologies pushed forward by feminist theorists such as Donna Haraway (2003) and Karen Barad (2007). Helen Hester, in her critique of the rising objectivity debate, reminds that

> "…it is not the specificity of a unit in and for itself that is a driving concern, but the confusion of the boundaries between things. This co-implication, entanglement, and mutual constitution is both philosophically compelling and politically necessary against the "border war" of "racist, male-dominated capitalism." (Hester, 2017)

This motivation against the "border war" is why I am not obsessing over "what is a machine" and trying to delineate it from humans. On the contrary, I am inquiring into the confusion and mutual constitution, and indeed the very relations that constitute the realities of humans and machines. The focus on the everyday allows me to grasp materiality in a tangible and relational manner. In the literature, the focus on everyday life and materiality has spawned many methodologically innovative approaches and discussions to social studies, such as object interviews (Woodward, 2016), speculative methodologies (Michael, 2016; 2012), and sensory ethnography (Pink, 2009). Thus, concern with the "onflow" (Thrift, 2008) of everyday life and the "mess" (Miller, 2010) of materiality prove to be valuable and prolific pursuits, especially when one is interested in "objects." Furthermore, these methodologies show that nonrepresentational approaches are beneficial when one is in the mess of materiality; thus, there is space for creative—and interdisciplinary—research initiatives. In the following section, I elaborate on how such research approaches could constitute a sociology of machines.

Methods and Projects

In this section, I outline methods for a different sociological conduct, which form the basis of the project at hand. First, I show how I theorized the notion of a living sociology and, subsequently, visit propositions of vital methodologies as grounds for a sociology of machines.

This process legitimizes the methods used in the analysis chapters, and these methods are presented at the end of the section.

Saving Sociology

As our everyday lives become increasingly infested with information technologies, the main vein in sociological theory gradually becomes destabilized. This point renders the discipline fertile for the search for new meanings, those that will push the limits of sociology or transform its boundaries. This is where I invest my energies in proposing a sociology of machines. Constricted among the forces of a "knowing capitalism" (Thrift, 2004), empirical sociological conduct loses its relevance to governments and corporations, or worse, it cedes its place to media and communication studies. Sociologist Les Back's autopsy on "dead sociology" elaborates on this and urges for a form of sociology that brings "craftiness to the craft" (Back, 2012: 20). Underlying these concerns is a critique of what the social theorist Ulus Baker (2020) terms "sociology of opinions": The dominant methods in the discipline, such as surveys and interviews, resulted in a kind of sociology that rests itself on the opinions of humans. Thus, sociology is rendered as an opinion of opinions, or an opinion among others, and its position is voided and reduced to the point of being utterly ineffective. Baker proposes images as a way to contend with this reality and pushes for "a sociology of affects" driven by a Spinozian approach. He centers on images to reinspire sociology and restore the momentum that lay in the conception of the discipline: "a sociology of affects…was already present in the insightful and illuminative period of the birth of the human sciences" (ibid:11).

Inspired by Baker, I suggest that a sociology of machines be an affective affair "which could enlarge the methodological toolkit of social research and of humanities at large" (ibid:160). Indeed, a sociology of machines seeks out an experience with machines which exceeds the bounds

of the contemporary matrices of domination and hegemony under which human–machine socialities commonly figure. Rather, sociologists find themselves enveloped by an affective reality with machines which, by virtue of their lived experiences, resists the calculative mode in which such machines have been long conceptualized. This approach dislocates the concern from a representation of experience as such and thus potentiates a departure from the realm of sociology of opinions and reintroduces wonder and imagination to the discipline.

Baker shows that attention to such Spinozian wonder affords the cultivation of new sensibilities that carry the discipline to new landscapes. As the case studies in Chapters 4 and 5 show, the development of different sensibilities is crucial for the kind of sociology that is proposed here. A sociology of machines adorned with playful and creative methodologies necessarily centers on imagination, restoring the meaning-making capabilities of the discipline. This effort resists reduction of sociology to a branch of media studies, or political economy, and is aimed toward rehabilitating sociology's founding insights: a strong connection between affects and their place in concrete life situations (e.g., social facts, collective effervescence, alienation, class consciousness, social action, social types, etc.). The chapters in this thesis build on affective qualities that find themselves at the intersection of art, technology and society.

Live sociology

Following the urge to find a sociological conduct that rises above the realm of opinions and also binds the threads from the earlier methodological discussions about the significance of nonrepresentational methods for inquiring into objects in everyday life, I turn to the possibility of a "live sociology" (Back, 2012; Michaels, 2012). I use the notion of a live sociology as a counterbalance to the extant literature's manner of treating technological reality as a hindrance, even a threat, to social existence. Trapping (even entrapping à la Heidegger) the social existence

of technology within the motions of the capital (Zuboff, 2018), within the habituations around recursive algorithms (Airoldi, 2022), and within a world of deep mediatization (Couldry and Hepp, 2016) leaves no space for a different manner of relationality. Such a trend in theory tends toward what Jean Baudrillard termed "fatality of theory": the end of social thought and thus the futility of theory. The motivation of this dissertation is not to subject all relations to those of the capital, but instead to save some space for different kinds of being together with technology which could potentially disturb the normal conditions under which the social life of machines comes to be. It stems from an aspiration to excavate an alternative mode of being in the world. I work with Heidegger's thought (in Chapters 4 and 6) for this reason: At the limit of calculative reasoning, perhaps one can still salvage a life of a different kind.

To this end, the dissertation also goes to the limits of a Western rationalist enframing and brings to the center of its concern those machines that act in weird ways. The impulse here is again derived from sociology: When things break, they reveal the limits of the system or structure in which they would normally come to be. In order to find artificial intelligence that is not completely corporate/military/government intelligence, I turn to broken machines, useless machines, or contexts that take the machine out of its intended use or take the logic of its application to an extreme (e.g., machine-as-author, Chapter 5). It has been instructive to identify that the questions this thesis deals with find resonance in artworks that reveal the very multiplicity concealed under the dominant framings of technological reality. For example, Maya Indira Ganesh's (2021) work "A Is For Another" consolidates different perspectives on AI into a dictionary form, engaging literature, art, and cultural work with one another. Her work shows how our meanings around humans, machines, and intelligence are shaped by historical contingencies, while at the same time giving space to new formulations that might emerge out of these conceptions.

In fact, the work at hand allies with Mashinka Firunts Hakopian's "Institute for Other Intelligences" that aims to unsettle the hegemonic way in which AI work has come to be understood. Hakopian targets six assumptions that largely shape mainstream AI work:

> "(1) presumption of a clear division between humans and machines; (2) the notion of the 'human' as an unmarked category; (3) the process of assembling data to train machines; (4) attempts to codify certain ways of learning and knowing as defaults to the exclusion of others; (5) the belief that automated decision-making yields neutral, objective, or accurate results; (6) the expectation that the benefits of technoscientific futures will be equitably distributed." (Hakopian, 2023:17)

This dissertation, by employing an "idiotic" approach to the study of phenomena (Michael, 2012), indeed suspends investment in the unproblematic employment of the above-stated positions. As stated earlier, I do not aim to differentiate humans from machines; instead, I focus on their interactions, entanglements, and co-becomings. In doing so, I also raise a criticism of the notion of the human as a universal category and rather start from the very situatedness and contingent character of humans *and* machines.

I include Mike Michael's discussion here: "By attending to the nonsensicalness, we become open to a dramatic redefinition of the meaning of the event" (Michael, 2012:170). In reorganizing the kinds of meanings that sociology can carve out of the normal conduct in AI, one can approach Stengers's discussion of the figure of the idiot. This is a conceptual character she borrows from Deleuze, who "resists the consensual way in which the situation is presented" (Stengers, 2005:994) and, in that resistance, calls one to "slow down, that we don't consider ourselves authorized to believe we possess the meaning of what we know" (ibid:995). Indeed, the work makes space for

those contexts and situations where such suspension of knowing can be illustrative and, in fact, troubles those processes that are sedimented into our common-sense understanding of the world.

While identifying the trends and patterns of social life is a primary aim of sociology, there should also be space for formulations that imagine and leave way for something that is "otherwise than being." A live sociology, per Les Back's problematization, comes from the above-stated contemporary opportunity to explore alternative ways to tend to the social world. Such exploration saves, or aims to save, the rigidified and limited attention that classic social scientific methods have cultivated within the discipline. John Law and John Urry (2004) identify the consequences of this rigidification for sociology: These methods cannot deal with fleeting, distributed, multiple, emotional, and kinesthetic phenomena. It is precisely these aspects of sociality that I focused on in my work for this dissertation: The relations described here may be ephemeral; the machines themselves are presented to be multiple; and relations with machines are taken to be emotional.

In formulating a live sociology, Les Back started with ethnographic social research that involved new media. In a way, this is the core of the present dissertation: It deals with new media and seeks out its questions in this context. More so, it elevates the ontologies of new media, mainly the form of the machine, to the objectivation of sociological gaze. In conducting my research, I focused on interactive technologies specifically as a basis for sociological theorizing; the study had a built-in reflexivity springing from its research creation approach (more on this below), and the fieldwork rested on collaboration with engineers, artists, and other social scientists. The fieldwork demonstrates a live sociology to the extent that it follows a commitment to "pluralizing the vantage points from which sociological attentiveness is trained" (Back, 2012:30). This end is mainly achieved by blurring the boundaries between sociology and art and, more particularly, between social thought and machine art. Ultimately, this dissertation aims to embody what Celia

Lury recommends: “live methods must be satisfied with an engagement with relations and with parts, with differentiation, and be involved in making middles, in dividing without end(s), in mingling, bundling and coming together” (Lury, 2012:191). The contribution of this thesis lies in the making of the middles, in mingling, and not only in coming together, but also in becoming together with machines.

Vital methodologies for a new sociology

Following the commitment to a live sociology, the dissertation's fieldwork comprised two research creation projects. The research creation aspect mainly sprung out of chance: This was a result of my institutional affiliation. The dissertation project was conducted within the interstices of technology, art, and culture and, accordingly, was positioned at the Milieux Institute, which promotes such intersections for contemporary research. I had the chance to work on my ideas through collaborations and research groups that upheld an experimental approach to troubled traditional conduct. Indeed, the domination of information in contemporary human societies allows us to reimagine our disciplinary conduct, especially in social sciences that rest on the positioning of the human at the center of their concern. The move to retain sociological thought in the context of technological entities enlarges the scope of the sociological landscape, all the while allowing a “craftiness to the craft” (Back, 2012). The impulse to contribute to the contemporary moment in a crafty way legitimized research creation for this dissertation, because, as Mimi Sheller puts it, “research-creation is one of the most effective ways to intervene in, engage with, and make ripples in this contemporary context” (Sheller, 2012:142). Research creation allowed me to engage with the social in an “experimentalist orientation” (ibid), which had not been part and parcel of sociological thought in its canonical forms. In the move to rehabilitate sociology, such creative

research approaches prove particularly useful, as they provide the methodological reflexivity that sociology has sought in itself, especially after the 1960s.

Research creation interweaves the research process with creative methodologies, combining art with (social) science. It is described in the Canadian context as "any research activity or approach to research that forms an essential part of a creative process or artistic discipline and that directly fosters the creation of literary/artistic works" (SSHRC, 2010). Indeed, the projects here have come to life through collaborative work, and the results have taken on a life of their own, living on the internet (Harvest of Signs) or in research laboratories (Machine Ménagerie). The most significant aspect of research creation, for the purpose of this dissertation, is the co-learning that occurred through the collaborative processes. Extended collaborations with my colleague, the engineer–artist Zeph Thibodeau, ultimately transformed both our approaches to our research projects. I was able to learn about the intimate machinations of robotic beings, the limits of machine learning approaches, and realistic potentials for the future of machines. Exploring questions of sociality in the context of artistic work expanded my own understanding of sociological conduct, and the interdisciplinary nature of the collaboration served as a fertile place to hone questions about machine sociality with a technological grounding. The dissertation thus developed into a form of sociological theorizing in the context of human–machine sociality sought in research creation projects.

Presentation of the Projects

Machine Ménagerie

Two main projects form the empirical components of this work. The first is Machine Ménagerie, which is the focus of Chapter 5. This project began through my association with Zeph Thibodeau and turned into a long-term collaboration for exploring machine–human relations in

social contexts with robots. The collaboration started at the Machine Agencies research group at Milieux Institute in 2018 and continued through different projects, the last of which was a robot residency at Goethe Institute Montreal in the summer of 2023. While this last iteration is not included in this thesis, it served as yet another avenue for exploring the same research question: How can we socialize differently with machines?

The cardinal point of these projects was the development of playful robots that operated on a machine learning algorithm. This programming was based on dynamism and continuous movement, as opposed to algorithms that seek optimization and homeostasis. Machine Ménagerie constitutes an assemblage featuring a diverse array of diminutive, self-governing automatons coexisting within a transparent enclosure. Diverse in morphology and complexity, these artificial entities lack any utilitarian purpose and instead engage in intricate interactions with one another and their surroundings, akin to human behavior. These entities represent certain human conceptualizations concerning life and consciousness, thereby presenting an avenue for criticizing conventional constructs of intelligence and selfhood. Conceived during a public "research performance" spanning three weeks, the robots were shaped in tandem with ongoing dialogues with visitors from diverse backgrounds. My main contribution was making sense of these robots and the wide array of emotional responses they induced in their interactants. I analyzed the Ménagerians and their interaction contexts as a way to grapple with newly emerging social contracts (Thibodeau and Yolgormez, 2020)—and as a source for the orientation and attunement of the human interactants to their machinic others (Chapter 5; Yolgormez and Thibodeau, 2021).

Harvest of Signs

The second project is Harvest of Signs, which is the subject of Chapter 6. This project was conducted in collaboration with Evan Hile and the artist David "Jhave" Johnston and spanned over

6 months. Jhave has extensive experience with machinic writing for artistic purposes. I first encountered his work with generative algorithms that wrote poetry and, in the process, troubled the common-sense understanding of the "author." Our project followed in the same vein, in that we cast GPT-3 as the main author of a glossary of intelligences. We started with the intention of composing an eclectic glossary of intelligences that would work to destabilize the hegemonic and normative hold on the conception of intelligence inherited from a certain history of coloniality, or what Stephen Cave (2017) calls "the dark history of intelligence." Thus, our aim was to multiply the definitions of intelligence or, rather, highlight the coexistence of different visions for what intelligence means—and which definitions presuppose what kinds of relationalities or are products of what kinds of normative assumptions.

Another thread that interested us stemmed from a curiosity about what machine intelligence might mean in the context of nonhuman agency. This curiosity peaked around the time when large language models were proliferating, and we decided to include GPT-3 in our project with the intention to experiment together. Our project organically became a co-writing process of collaboratively and iteratively weaving a glossary of intelligences. What we did was prompt the model with language gleaned from major textbooks, handbooks, glossaries, and recent papers published in cognitive science, human psychology, animal psychology, ecology, cybernetics, and artificial intelligence. As we fed the model these terms, we found that GPT-3 was capable of inciting discussion among us, as well as synthesizing its own cultural contribution. Thus, ultimately, we decided to rely more on the model's outputs, and as humans, we just edited the text as we went along.

Relation to sociology of machines

Both the above projects, Machine Ménagerie and Harvest of Signs, were small-scale creative initiatives with a common aim: taking seriously the very being of machines. Our machine collaborators had tangible agency in the shaping of the projects, as well as in shaping the socialities that emerged around them. In both cases, I was moved by these machines, not because of some interesting superpower that artificial intelligence technologies had endowed them with. I did not glimpse a "new kind of intelligence" (Kasparov, 1996). I was instead affected by their particularities and always leaned into their socialities in a playful manner. This playfulness provided me with the possibility of looking at these machines in situ; I was not a remote observer taking notes in a corner as the classic ethnographer. My work encapsulates a series of experiences that I mobilize here through a reading of social thought and in searching for a response to the question, "What other relations could humans have with machines?" I could thus create this framework that I now call a sociology of machines: relations that exceed the normative character of technology which we have inherited from the Modern Days era; relations that do not contribute to the logic of capitalist political economies can find room in this framework. These relations are shaped through communities that involve other-than-humans; the tone is low; and affective alliances form across supposed divisions of all kinds: disciplines, nations, and even species. Here, I propose a sociology of machines that is concerned with the experience of machines and which takes force from creative practices so as to establish alternative relations and different pathways into alternative futures.

Conclusion and Prologue

In this chapter, I have positioned the project by showing the methodological commitments and how the methods used in the work relate to the overall theme of a sociology of machines. The

focus on the micro-substantia of human–machine socialities and the ability to trace the cultural biographies of machines made possible the idea of a living sociology, as I employed creative and playful practices to deal with the contemporary experience of machines. Machine Ménagerie and Harvest of Signs are both collaborative endeavors involving machines, and the machines themselves have substantially contributed to both projects. The following chapters discuss these projects and reveal the kinds of attunements and orientations that machines garner in such collaborative or cooperative spaces, which stand in contrast to the normative relations under the technological order. Before the reader launches into the discussion chapters, let me briefly state why I chose to study machines and what this investigation ultimately means for the two projects.

Why machines?

First, I am tackling the "machine" as a category, because machines very concretely affect the flow of social life and, in turn, are affected by it, thereby shaping the conditions of social action at the micro, mezzo, and macro levels. Machines seem to be forming the ground on which other entities gather and reveal themselves (Yildirim, 2018). There is a reason why I am not talking about nonhumans at large here, which would include rocks, mountains, and planets, as well as trees, animals, and fungi. There is a particularity to the machine that these other nonhumans do not necessarily have: The machine existentially depends on humans. It is artifice, created by humans, and thereby represents the metabolization of nature by certain proclivities of the human mind and body. Machines sit at the intersection of the (forced) division between humans and nature, or even between nature and culture. Machines and humans share an intimate link; there is a relation of interdependency and reciprocity, which makes the category of machine tangible for the sociological gaze.

While this is the case, that is, while the machine indeed is intimately bound to the human, it also exceeds the human in its being. The machine is an interlocking of mechanisms; it gathers beings and entities, as well as nations, markets, and ecosystems. It is at once a material assemblage of components and a discursive entity, encompassing a variety of techniques, allegories, and organizations. It is myth and reality, but not necessarily of a simulacric nature. I am focusing on the machine so as to sociologize it beyond its capacity for control and influence. I tackle this category in a relational and creative way so as to retain a sense of novelty and possibility. This move is meant to salvage the concept from a purely technical or institutional footing and reveal its work (or essence, as Heidegger puts it) in inspiring freedom.

I am thinking about how machines were in the background of modernity (perhaps they were the "hum" of modernity?), even while making modern society possible through creating and sustaining connections and interdependencies among people. If modernity is where the concept of society emerged, it only emerged through a system of machines. In this way, machines and societies have perhaps always been intertwined. Thus, what I propose under a sociology of machines is a way to deliberately tackle this category and shape it. Can one find machines that do not live to exert control over humans and nature but can be creatively linked to their communities? This question necessitates looking beyond the corporate veil under which machinic production is largely accomplished in late modernity. This is why I am focusing on marginal cases, so I can restore a sense to machines beyond their servitude to human will.

Why a sociology of machines?

The main contribution of this dissertation is its decentering of "the human" as the sole conductor of all social processes. The current dominant critique of technology in general, and AI in particular, focuses on the 'loss of the human', in the process, holds onto a naive humanism that

seeks out to reinscribe the old category of the human that was established with modern sciences. My position here takes seriously the criticisms raised in poststructuralism against this assumed universality of the human that actually is historically and materially contingent. If the category of the human is actually dependent on the particular history, then it means it is amenable to transformation. Therefore, the impulse here is to decenter the human so as to redistribute it in a manner that moves away from the ableist, classist, racist, and sexist preconceptions. I center on relationalities with machines as a way to "release humans from "the human"" (Rees, 2018:35).

My project treats machinic entities as legitimate interactants that very concretely create affect and connection in their human counterparts. This approach finds form in relation to Mike Michael's (2012) "idiotic methodology," which busies itself with objects that do not behave in expected ways. Indeed, the machines that were the subjects of this dissertation either exceeded the expectations of their designers/users or were specifically designed to go against common conceptions about machines' usefulness and instrumentality. It is on this point that the chapters of this dissertation manuscript converge: In troubling the hegemonic forms of human–machine relations, the projects build spaces for exploration and playfulness which could serve as a ground for the emergence of new meanings.

These chapters progressively feature an evolution of thinking from a sociology of AI to a sociology of machines. This shift occurred organically, as my argument itself became more generalized and as I grappled with interactive technologies of different kinds. The thesis aims to deal with machines as a kind of social type that includes AI technologies but is not limited to them. The thoughts and experiences that indirectly informed the thesis were technologies of all kinds: the "hum" of refrigerators, stolen phones, champion laptops, gruesome airplanes, etc. In order to

encompass such a variety of technologies, I finally arrived at the title of this work: “A sociology of machines.”

Without further ado, let me present the work.

Chapter 3: Machinic Encounters – A Relational Approach to Sociology of AI

Foreword

This chapter was published in the book "The Cultural Life of Machine Learning: An Incursion into Critical AI Studies", edited by Jonathan Roberge and Michael Castelle (2021). Here I deal concretely with the notion of the social and question how the sociological conception of the social is being transformed by the introduction of AI technologies in daily life. To get at this, I read together the thoughts of George Herbert Mead and Alan Turing, and deduce a conception of agency that is based on social change. Here is also where I make the first attempt at sketching out a sociology of AI as a program, which is later developed into the idea of a sociology of machines.

Introduction

What is it that we call "social?" What is a society, and what are the implications of our conceptions of what societies consist of? How do studies of the "social" organize this understanding and construct the limits of our sociological imagination? Dealing with the social aspects of the technological, especially in the field of artificial intelligence (AI), is becoming increasingly urgent. For example, MIT Media Lab researchers recently proposed to construct a completely new field called *machine behavior* (Rahwan et al., 2019); their aim is to conceive of a field between the AI sciences and the social sciences in which the machine's behaviors and the social world around them mutually influence one another. The growing hype around AI (perhaps just before its third winter, as some would have it) has created much conversation about how these technologies are becoming part of everyday lives and legitimated existing academic debates over the social impact of these phenomena. Initiatives such as Data & Society and AI

Now have been working on the social and political consequences of algorithmic cultures for the better part of the past decade. The dramatic shift of attention to the social and political aspects of AI is a testament to the necessity of including social scientists in core debates about the development and circulation of these technologies. However, these conversations, which are very much vital in the current political climate, do not necessarily attempt to make any significant theoretical claims about the status of machinic intelligences and/or how to deal with them conceptually.

This chapter proposes another possibility for dealing with this phenomenon, one that would necessitate a transformation of the boundaries of the common conceptions of the social sciences in general and sociology in particular. First, the chapter will elaborate on Luciana Parisi's (2015) argument that indeterminacy and uncertainty are becoming paradigmatic concerns rather than limits in computational theory. Then, it will bring together ideas from Alan Turing and George Herbert Mead, specifically emphasizing their conceptions of novelty; from this reading it will advance a proposal for a relational sociology of AI. In doing so, this chapter aims to contribute to a conceptual paradigm that would create the possibility for looking at these technologies not just as harbingers of capitalist notions of efficiency and productivity, but as *contributors* to concepts of social agency and novelty. Formulating AI as a social agent that is dynamic and intertwined with indeterminacy would make it possible to theoretically open AI agents up to becoming part of other worldings (Wilson and Connery, 2005). The critical literatures dealing with the social implications of AI would take them as integral parts of the political economies that lie behind the machines themselves. This chapter acknowledges such a route, and yet diverges from it in that it seeks to destabilize the close ties between machinic agencies and capitalist relations. Following this, it allies with an insurgent posthumanist position

that contributes to "the everyday making of alternative ontologies" (Papadopoulos, 2010:135). The aim here is thus to expand the sociological landscape to include AI agents in ontologies of the social. The driving question is: how would the everyday practice of sociological imagining shift if it incorporated machinic intelligences as social entities into its purview?

In order to start thinking about AI as an integral part of a social interaction, and not just a mechanical tool that is the extension of already established structures,[4] it is appropriate to focus on the very dynamism that underlies the operations of these intelligences. What separates some genres of AI from other machinic entities and straightforward computational processes and makes it a potential sociological being, is its capacity for interaction, which in turn takes its force from uncertainty. I will examine Luciana Parisi's conceptual work on the centrality of uncertainty in computational processes and turn to Alan Turing to locate this uncertainty in his theory for computational intelligence. This opening, then, will be read through George Herbert Mead's sociology of mind so as to position sociological thinking at the core of AI theorizations. This could be a significant contribution in that the proximity between the theories of Turing and Mead has not yet been made explicit in the literatures that deal with the sociality of AI. As we shall see, with the increasing emphasis on the notions of dynamism, interaction, and indeterminacy in discussions about developing AI, a sociological approach to the study of the machinic mind becomes more appropriate. I argue that Mead's perspective makes it possible to see the relational basis of AI agency and to open up this agentic black box to sociological inquiry.

[4] Such structures span from cultures of corporations and start-ups in the tech industry to those of computer science departments and research institutes.

Sociology of AI

Why should sociology deal with AI? The obvious answer is that AI is increasingly becoming part of our everyday lives. AI automates certain sociotechnical processes and invents new ones, and, in so doing, it introduces certain preconceptions, often in black-boxed form, to the social realm, all the while redistributing the inherent injustices or inequalities of the systems that humans reside in. Issues such as algorithmic biases, the narrow visions of social roles that AI agents take—for instance, Amazon's conversational AI Alexa's contribution to gender and race dynamics is still controversial—and the consequent reproduction of already existing power structures have been problematized in the literatures that deal with AI's social impact (Burrell, 2016; Caliskan et al., 2016; Parvin, 2019; Hannon, 2016; Phan, 2019). This work is necessary in order to discuss how such technologies take on the historical forces of capitalism, colonialism, patriarchy, and racism and disseminate and rigidify these logics in societies, asymmetrically influencing social groups. The social sciences have taken up the task of discussing and revealing the work that AI phenomena are actually performing as well as speculating on the work that AI might perform in the world. In this line of scholarship, AI emerges as an instrument of technocapitalism and has no real agency on its own; AI can only further the agenda of the systems in which it is embedded. It adds speed and efficiency to processes that are already broken from the perspective of social justice. While all this is true, and while the work that focuses on these aspects of AI is very important (especially as policies to manage the implementation of these technologies are negotiated), there are other and perhaps more consequential ways to think of AI sociologically.

The science and technology studies scholar Steve Woolgar, in a previous generation of AI research, proposed a perspective that would substantiate sociological conceptions of AI.

Woolgar (1985) asks the question "Why not a sociology of machines?" to provoke a rethinking of a foundational claim of sociology, namely, that the social is a distinctly human category. He starts by criticizing the narrow role given to the sociologist in discussing AI research; their contribution is generally taken as assessing the "impact" of these technologies, i.e., how they influence the societies that surround them, rather than detailing research processes. This, he claims, contributes to a division between the notions of the technical and the social, thus maintaining the divide between nature and the social. He argues for a methodological shift that would put this distinction into question by bringing the genesis of AI into sociological perspective. His argument points toward an extension of laboratory studies (Latour and Woolgar, 1979; Knorr Cetina, 1995) and unsettles the belief that scientific or technological advances occur in a vacuum devoid of interests or meanings. He elaborates his point by providing an analysis of expert systems, which exemplify both how the AI enterprise feeds on the dualisms that pervade the modern sciences and how it maintains its "extraordinary" character. Woolgar thus suggests focusing on the assumptions that go into AI discourse and practice, so as to highlight what kinds of meanings are mobilized to legitimize certain actions and research agendas.

Thinking about why one should study the sociology of AI, a less obvious answer could be the introduction of new modes of thought that algorithmic automation makes possible. For example, with reference to the work of mathematician Gregory Chaitin, Luciana Parisi shows that the assumed algorithmic relationship between input and output has been disrupted; Chaitin's work expands the limits of computational theory by integrating randomness into the core relation between input and output. Parisi then shows how this entropic conception of information points to the emergence of an "alien mode of thought" (2015:136). This became the case as information theory started treating the "incomputable" as a central tenet of computational processes; she

claims that this points to a transformation in the very logic of algorithmic automation. This is interesting for a number of reasons, and Parisi frames this transformation as pointing toward the limitation of critiques of instrumental reason. In conversation with Bernard Stiegler's (2014) argument that thought and affect become engines of profit under technocapitalism and Maurizio Lazzarato's (2012) claim that all relations are reduced to a general indebtedness through apparatuses of automation, Parisi carves out another possibility that rests on the context of this "all-machine phase transition" (2015:125). She complicates this reading of algorithmic automation that frames machines as linear extensions to capitalistic agendas. She maintains that there is a shift toward dynamism in algorithmic automation, which, if taken into account, challenges the assumed direct relationship between computational intelligence and instrumental reason. She shows how an interactive paradigm is starting to take center stage in computational theories, where notions such as learning, openness, and adaptation come to define such systems.

Possibility of Interactivity in Machinic Intelligences

What is important here is that this dynamism, not canonically considered to be a logic of computational intelligence, becomes the central notion of digital minds.[5] Before the introduction of dynamism, understandings of automated intelligence rested on a static view, wherein the relationship between input and output was taken to be direct and undisturbed—information unproblematically flows between symbolic circuits, and data is computed with a discernibly rule-based, programmed logic in a closed system. There is a certain input, and programming allows that input to be transformed into the desired output. In this paradigm, error, or any form of

[5] There were many practitioners of AI who worked on dynamic systems and resisted representational approaches to building machinic intelligence in the earlier days of AI. Rodney Brooks' projects fall within this paradigm of computation; they take the notions of interactivity and environment very seriously (Brooks, 1987). His students Phil Agre and David Chapman have also dealt with dynamic computational procedures that could deal with the complexity of everyday life (Agre and Chapman, 1987; Agre, 1997).

deviation in the processing of the program, necessarily brings about a break in the system. The flow is interrupted, the machine is broken, the process is severed, and a finality has been reached in the computational procedure. In this paradigm, then, when a break is experienced due to a deviation, human bodies flock to the moment of error, finding the cause of the disruption and reinstating the procedure that is the representation of a pathway to a (pre)determined output from a certain input. It is in this sense that algorithmic automation reflects a mode of intelligence that has a purpose and a finality, or rather, reason. The relationship between input and output is direct, or at least logically structured, which makes computational intelligence a goal-oriented reasoning process. This is why computational processes are taken as hallmarks of order, to the extent that they carry out the reasoning of their programming/programmer. Yet, as Parisi points out, this is not the only manner in which, in her words, "algorithmic automation"—and for us, machinic intelligence—unfolds in social reality. Rather, she argues, as indeterminacy or uncertainty become fundamental to the functioning of computation, these systems become dynamic, open to interactivity, and thus active *in the world.*

AI, when thought in relation to reason, comes to emerge as an orderly, rigidly defined process that interfaces input to output; this means that machinic intelligence works in a predetermined manner with discrete units of ones and zeros. Yet in neural net–based approaches to building AI or interactive computation, this rigid process is disturbed, as indeterminacy is introduced to the computational process. What appeared to be a perfect machine—a "universal machine" in Turing's formulation—does not, in effect, come close to perfection if it is to operate *in situ*. In his discussion of technical objects, Gilbert Simondon ([1958] 2017) arrives at a similar idea, in that closed systems only constitute a phase in the evolution of machines. Rather,

indeterminacy and openness create conditions for the emergence of the unexpected, which would be the next phase in technicality. In his words,

> "The true progressive perfecting of machines, whereby we could say a machine's degree of technicity is raised, corresponds not to an increase of automatism, but on the contrary to the fact that the operation of a machine harbors a certain margin of indeterminacy. . . . A purely automatic machine completely closed in on itself in a predetermined operation could only give summary results. The machine with superior technicality is an open machine, and the ensemble of open machines assumes man as permanent organizer and as a living interpreter of the inter-relationships of machines." (Simondon, 2017:5)

For Simondon, the possibility for humans to co-work with machines lies in the revealing of such a degree of indeterminacy, which is veiled by the black-box quality of the machine. This point is significant, as indeterminacy allows the possibility for an interactive organization to take place across humans and machines. The conditions of possibility for an emergent interaction order (Goffman, 1967; 1983) lie in the recognition of this indeterminacy.[6]

As Parisi shows in more concrete terms, computational theory already deals with randomness and infinities and does not cast them aside as irrelevant or beyond the scope of computation. Rather, machinic intelligence (or algorithmic automation) turns "incomputables into a new form of probabilities, which are at once discrete and infinite. . . . The increasing volume of incomputable data (or randomness) within online, distributive, and interactive

[6] There are many social theories that put uncertainty as the primal condition for interaction. Bakhtin's (1981) dialogical theory is one such theory.

computation is now revealing that infinite, patternless data are rather central to computational processing" (Parisi, 2015:131). In Parisi's explanation, derived from Chaitin's more mathematically oriented work, indeterminacy and randomness are taken as productive capacities in communication systems,[7] as randomness challenges the equivalence between input and output. This randomness emerges from an entropic transformation that occurs in the computational process, where the compressing of information in effect produces an increased size in the volume of data. Computational processes are traditionally taken as a process of equilibrium, i.e., a straightforward interfacing between different modalities of data. However, Chaitin shows that there is an indeterminacy and incalculability intrinsic to the computational process.

Irreducibility of Machinic Intelligence

This incomputable element makes machinic thinking irreducible to humanist notions of thought. Rather, machinic intelligence is transformed to include randomness in its algorithmic procedures. The incomputable marks the point at which interactive machinic systems come into being.[8] For Parisi, this point holds the potential for automated intelligences to encompass a landscape that exceeds the logic of technocapitalist instrumentalism, all the while saving the concept of reason from the clutches of market-driven capitalism. She argues that

> "the incomputable cannot be simply understood as being opposed to reason. . . . These limits more subtly suggest the possibility of a dynamic realm of

[7] For the purpose of this work, randomness and indeterminacy enable the conceptualization of machinic intelligences as agents in social interaction. Machinic intelligences are dynamically unconcealed, and this dynamism renders them as part of social relationalities.

[8] Similar works have been produced that point to a shift from an algorithmic to an interactive paradigm in computation. An enthusiastic incursion in this line is Peter Wegner's (1997) "Why Interaction Is More Powerful Than Algorithms?", where he announces the transition as a necessary continuation of the closed system of Turing machines: "Though interaction machines are a simple and obvious extension of Turing machines, this small change increases expressiveness so it becomes too rich for nice mathematical models" (1997:83). Wegner is also making a link between indeterminacy and dynamism.

> intelligibility, defined by the capacities of incomputable infinities or randomness, to infect any computable or discrete set" (Parisi, 2015:134).

In Parisi's explanation, then, the machine does not simply operate in the intelligible realm of computability, but includes randomness that creates the conditions for its interactivity and dynamism, in the sense that the initial conditions of the algorithmic process become malleable. The best example of this irreducibly nonhuman/machinic intelligence can be found in financial systems. As high-frequency trading systems work with large amounts of data and include stochastic programming, their logics of operation spill away from rule-based, linear procedural space; in practice, financial algorithms are usually developed with randomness recognized as part of their computational processes.[9]

Randomness thus becomes intelligible, albeit in a closed manner. Deviating from Simondon's foreshadowing, these incalculables become intelligible, and yet they cannot be synthesized by a subject. The randomness resists an assimilation into sameness. Parisi interprets this as suggesting that "computation—qua mechanization of thought—is intrinsically populated by incomputable data" (ibid:134). She emphasizes that this is not an error or a glitch in the system that awaits fixing but rather a part of the processes of computation. This contributes to a conceptualization of machines as entities in their own right and makes possible the emergence of "the machine question" (Gunkel, 2012), in that machinic intelligences can be considered as legitimate social others, i.e., entities that are capable of "encounter" in a social sense as they cannot be absorbed into a sameness in the interaction. The relationalities that emerge from the encounter between human and machinic intelligences have the capacity to evolve in novel ways

[9] For more on high-frequency trading, please refer to Lange et al, 2016; Mackenzie, 2018.

due to the irreducibility that stems from uncertainty in the computational process. As Parisi describes, "incomputables are expressed by the affective capacities to produce new thought" (2015:135). The possibility for novelty, then, lies in the recognition that these incalculables are part of computational thinking, as they "reveal the dynamic nature of the intelligible." This novel form corresponds to a "new alien mode of thought," as Parisi calls it, that has the ability to change its initial conditions in ways which would reveal ends that do not necessarily match human reasoning.

Interestingly, Alan Turing also talked about intelligence as being equivalent to machines' capacity to change their initial instructions. In his 1947 lecture to the London Mathematical Society where he first disclosed his ideas about a digital computer, he elaborates on the conditions through which a machine would be taken as being intelligent. The machine that he describes is different from his Turing machine in that it follows the instructions given by a human and yet has the capacity to change its initial programming. What is significant here is that the machine actively contributes to the production of outputs by deviating from the original procedure—designed by the human—between input and output. Turing, then, recognizes that the perfect and seamless processing of information stands against any conception of intelligence in computation: "if a machine is expected to be infallible, it cannot also be intelligent (1947:13)."[10] He points toward failure, or even error, as a necessary part in the process of cultivating intelligence in machines.

[10] The Dartmouth proposal makes a similar introjection while talking about how to formulate an artificial intelligence: "A fairly attractive and yet clearly incomplete conjecture is that the difference between creative thinking and unimaginative competent thinking lies in the injection of some randomness" ((McCarthy et. al., [1955] 2006:14).

Here it is important to specify that not all AI agents operate socially, as it is the case that not all AI are "intelligent" in the same way. However, there is more concrete investment and output in developing "intelligent" systems of a dynamic kind. The examples that fall into this category use Deep Learning techniques such as supervised and unsupervised learning through neural nets. The famous Go-playing AI, AlphaGo (developed by DeepMind), is one such example. This agent "learns" how to play the game either with (e.g., supervised learning; Silver et. al., 2016) or without human knowledge (Silver et. al., 2017). Also, the still emerging intersection of creative AI can fall under this "irreducible" category; for instance, Generative Adversarial Networks (GANs) that work on stochastic principles to generate content—e.g., images, text, sound—are an example of algorithmic intelligences that work through a kind of dynamism. These technologies are either designed to function in social realms or to operate interactively, rendering possible relational analyses. This relational character could open up other ways with which AI could be thought, and not as "just" a technology. In the next part, I will try to account for the agency of AI in a sociological sense by reading Turing's formulations through George Herbert Mead's sociology of mind, and I will consider the implications that this reading would have on the conception of sociality and agency.

An Encounter: George Herbert Mead and Alan Turing

George Herbert Mead's influential work *Mind, Self, and Society* (1934) deals extensively with how meanings and selves are formed through societal processes. His efforts were concentrated toward giving a sociological explanation for the phenomenon of consciousness, and thus his ideas form an early "sociology of mind." His formulations were, paradigmatic for the time, very much influenced by humanist ideas. In his thought, the human mind is largely constituted by societal forces, and human (inter)action is guided by communication. Even so, he

does not give a completely socially deterministic account, such as a social structure determining the actions of an agent. As will become clearer later in this section, he puts a great deal of emphasis on the novelties and surprise effects, the incalculable and unpredictable, as harbingers of social change. It is once again this idea of incalculability that brings closer the computational "mind"[11] to a social conception of mind.

The potential for novelty was of interest to Turing as well, especially in his famous article "Computing Machinery and Intelligence" (1950). Turing seems to have two perspectives on novelty when it comes to computers. These two perspectives might appear to be contradictory at first, as will become clearer in the following; however, the contradiction between his two answers to the question of whether machines can do anything new doesn't necessarily make these views mutually exclusive. The first view emerges in his consideration of "Lovelace's objection," taking up Lady Lovelace's assertion that a machine can "never do anything really new." Turing suggests that the appreciation of novelty rests in one's "creative mental act," and that if one brings in a deterministic framework to make sense of the world, then the surprise effect produced by the computer will never be captured. For Turing, then, the question is not whether the computer can do anything new, but whether humans have the right attitude to be able to perceive its surprise effect. In this line, the capacity to attribute agency to machines rests on humans' conception of these machines. Who gets included in the "human club" (Lestel, 2017) depends not only on the frames with which humans interpret the agency of machinic intelligences, but also on extending interpretive charity in their interactions so as not to dismiss the machine as a simple tool that crunches numbers. This move might be taken in the framework of social creativity (Graeber, 2005), as the interactions with the machines might pave the way for

[11] Although mentioned here, the present argument does not deal extensively with the question of the mind.

the emergence of different social practices than the ones that circulate in current imaginaries. While this opens up a way to think about how to establish different relations with machines, it must be stressed that this is an anthropocentric approach in that it puts the human as the ultimate responsible[12] entity that could extend agency, within the bounds of one's own reason. In this conceptualization, the machine is at the receiving end of humans' extension of agency and is itself actually a passive or determinable entity. This chapter will instead take more concern with the incalculable, the unexpected, and the surprise that can be brought about by the agency of machinic intelligence.

Even so, Turing's affective articulation with regard to machines—such as when he states that machines take him by surprise with great frequency—might be considered part of this social creativity. He also puts the emphasis on the conditions under which the machine is performing and says that if they are not clearly defined, machine's intelligence will indeed emerge as a surprise. Turing opens the door for this unpredictability and furthers his argument by stating that a fact does not simultaneously bring its consequences to the purview of the mind. A fact's novelty thus might rest in a potentiality, in a sense. There remain parts, or aspects, of a fact that remain undisclosed, that are "temporally emergent" (Pickering, 1993). Therefore, even the crunching of numbers, or undertaking a pre-given task, can be thought of as part of novelty; the newness rests on the machine's act of calculation, and we can only observe it if we have a creative conception of the machine. It is from this point that the present chapter takes its inspiration. Indeed, a creative conception of machine intelligence is what the sociology of AI would take as its core problematic.

[12] Even infinitely responsible, echoing Emmanuel Levinas' (1979) ethical philosophy.

The second notion that Turing brings up in relation to novelty is error. In his defense of machinic intelligence, he elaborates a potential critique of AI that would rest on the idea that "machines cannot make mistakes." This critique would stem from the speed and accuracy with which machines calculate arithmetic problems; this, then, would always lead to a defeat in an Imitation Game. An interrogator can pose a problem, and the machine would either answer very fast, or, if the machine is to confuse the judge, would deliberately make mistakes so as to pass as a human (who is prone to error). But in this case, the mistake would be attributed to its design or a mechanical fault, and still the status of the thinking machine would remain questionable. He states that this particular criticism confuses two kinds of mistakes: "errors of functioning" and "errors of conclusion"; this is where his two perspectives on novelty seem to converge. The former would cover for the kind of mistake that the example presupposes, namely, that error would emerge from a fault in the system. These kinds of errors can be ignored in a more philosophical discussion, as they would not carry an abstract meaning. It is on the errors of conclusion that Turing puts more weight. These arise when a meaning can be attached to the output of the machine, i.e., when the machine emits a false proposition:[13] "There is clearly no reason at all for saying that a machine cannot make this kind of mistake" (Turing, 1950: 449). The capacity for the machine to make errors, for Turing, makes it possible for it to enter into the realm of meaning.[14] It is a deviation not only from the expectation that the machine makes

[13] Turing's proposition makes it possible to formulate the intelligence of the machine in the realm of meaning as stemming from its capacity to move away from its initial programming. However, this is not the only manner in which AI could be said to be contributing to meaning making. Some branches of AI, such as computer vision, natural language processing, or context-aware algorithms in general, can contribute to decision-making processes. As they become part of the agency that results in action, it could be said that they also operate in the realm of meaning. Turing does not talk about different genres of programming, as his discussions are rooted in Turing machines and learning machines; for this reason, I have not indulged in detailing more specificities of such technologies.

[14] This claim can be read with analogy to Langdon Winner's famous argument about politics-by-design and inherently political technologies. Winner suggests that there are two ways in which technologies are political. Politics-by-design suggests that the technologies might reflect some politics that go into the design and implementation of a technical system. Whereas inherently political technologies refer to "systems that appear to require, or to be strongly

perfect calculations but also from the machine's own process of calculation. The machine's process is uninterrupted, in that its error does not emerge as a break, and if the output is faulty, it constitutes a deviation from the system itself. It is this deviation from the designed system that enables a discussion of the agency of the machine, as it creates a novelty that comes with a surprise effect; the ensuing socialities then bear the potential to shift the already existing system.

This novelty-through-surprise effect can be captured in George Mead's sociology of mind as well. His theory will be discussed in relation to the machine's capacity for novelty, so as to arrive at a distributed understanding of agency. Mead makes the case that the essence of the self is cognitive and that mind holds the social foundations of "self," which is composed of two parts: the *me* and the *I*. The *me* forms the social component that calculates the larger context in which one is located; it takes a kind of "world picture" and comprises organized sets of attitudes of others. In a sense, *me* is nested within an organized totality; it can be thought as the rules of the game or the objectified social reality. It is the system in which the individual self acts or, rather, the individual's image of that system. It is a general conception of others (the "generalized other") and is produced a posteriori to the moment of action. Mead uses *I* as that which emerges in the moment of (inter)action as a response to that which is represented in *me*. He emphasizes that the response to the situation is always uncertain, and it is this response that constitutes the *I*. The resulting action is always a little different from anything one could anticipate; thus *I* is not something that is explicitly given in *me*. Lovelace's conceptualization of a computer as a machine of calculation (the Difference Engine is one such machine) may be

compatible with, particular kinds of political relationships" (Winner, 1980:123). Taking his formula under the concept of error, one can talk about error-by-design or inherently erroneous machines. Error-by-design would once again bring the analytical focus onto the designer or some mechanical fault. However, if the machine is inherently erroneous, then our analysis would have to deal with the agency of the machine.

compared to the operations of *me*. It calculates and provides a representation; the machine, again, emits a world picture. However, in the moment of action, as Turing contends, there is always room for deviation, and, in the case of machines, this happens—perhaps more often than desired—through error.

The errors of conclusion, then, can be compared to Mead's formulation of the *I* as the subject of action that does not rest on its preceding calculations. For both Turing and Mead, the possibility of newness and change comes from the agent's ability to dissociate from the calculable realm, and not through an act of conscious choice, but by what can be termed coincidence or spontaneity.[15] The *I* of the machine, then, comes as a surprise effect. Even though the *me* may calculate things in advance, these calculations may be surpassed by the action of the *I* in the very instant where action comes into being. The mind, according to Mead, can thus reveal itself in a completely novel way, defying anticipation. The *I*, then, stands for subjectivity and the possibility of social action; it harbors the bedrock of agency.

Both for Turing and Mead, the possibility of newness and change does not reside in the act of conscious choice; but necessarily arises out of the agent's capacity to step away from the calculable realm. The novelty emerges in the moment of action, as the relationalities that constitute the agent both provide the ground for calculability and weave different realities that are realized by the emergence of novel action. Those actors who can incite novelty in the world can engender new socialities. In Mead's discussion, sociality refers to a state that is between different social orders. It is an in-betweenness where the response of the *I* has not yet been

[15] It could be said that Turing had insight into the sociological workings of the mind, even if he did not explicitly deal with these questions. Indeed, a recent article highlights how Turing's life and work reflects the three features of sociological imagination of C. Wright Mills (Topal, 2017), as Turing was a) able to work out the relations between what is close (human mind) and what is distant (machine); b) through these analyses, was able to define new sensibilities; and c) had the ability to imagine a future sociological reality.

integrated and objectified in the *me*, and thus an alternative order can be anticipated. Considering machinic agencies with the capacity to incite such sociality, then, requires our methodological attention to be honed toward the moment of interaction.

Agency in Sociality

Talking about interaction without presupposing the existence of humans is not exactly part of sociological tradition. The concept of social interaction would generally assume that human individuals exist prior to interaction and there is a consciousness pertaining to the humans that precedes the interaction. One of the canonical discussions in this line is Max Weber's theory of social action, where he focuses on the meanings that actors give to their actions and comes up with his famous four *ideal types* of social action that are determined by the intentionality of the actors (1978:24–5).[16] The concepts that classical sociologists and their descendants have utilized to make sense of social interactions set the tone for this practice to be only intelligible on the level of humans: consciousness, intention, self-identity, reflexivity, other-orientation, active negotiation, and language-based communication (Cerulo, 2009:533). The modern humanist tradition privileges certain types of humans over others and attributes a totality to interiority (an enclosed mind) as opposed to incorporating an exterior world upon which action is taken. This tradition presupposes a gap between the human prior to (inter)action and a static empirical world that receives the action.

Shifting the focus from before the action (intention, consciousness) to the moment of interaction itself dissolves the self-enclosed individual and allows for the possibility of considering actors' thinking as being *constituted* by the interaction. Thus, the agencies that

[16] Weber doesn't use the term intentionality but rather "feeling states" (1978:25).

contribute to an ongoing social interaction come to be defined a posteriori, which allows uncertainties and incalculables to become part of the analysis. Furthermore, this notion of the social also opens up the possibility of including nonhumans as participants in the constitution of social reality[17] as their capacity for encounter becomes legitimized.

When the notion of the social is uncoupled from the human, it also becomes possible to see agency not as bound to an entity but as a constellation of forces that produce an effect in the world. Put more clearly, agency is an effect of the relation between objects—both human and nonhuman. This is a slightly different take than what Actor-Network Theory (ANT) offers. ANT scholars (Callon, 1986, 1987; Latour, 1987, 1988, 1996, 2005; Law, 1992) place much emphasis on conceiving of actants as nodes in a network, working heterogeneously with one another; they do not pay much heed to the notion of the ontologically social. Tim Ingold (2008) points to this gap between the heterogeneous entities that operate in an actor-network and proposes, rather, that action is produced through the lines of the network—in his words, the *meshwork*—which is intimately bound up with the actors. In contrast, agency in ANT is the effect of action, and it is distributed among the actants who are in a network by virtue of the actions that they perform. While this action cannot be reduced to a single entity, it is still understood as capacities of the individual constituents that reside in the network. Ingold suggests, rather, that action "emerges from the interplay of forces that are conducted along the lines of the meshwork. . . . The world, for me, is not an assemblage of heterogeneous bits and pieces but a tangle of threads and

[17] This is in line with Actor-Network Theory's emphasis on symmetrical treatment of the entities—human and nonhuman—that go into a social analysis. Bruno Latour's (1992) famous essay "Where Are the Missing Masses" is a critique of sociology's exclusion of nonhumans from the ontologies of the social. While controversial, this argument opened up a rich avenue for analyzing the construction of reality with particular—symmetrical—attention to materiality and nonhuman actants.

pathways" (2008:212).[18] Through our reading of Mead's sociology of mind, this chapter argues a similar point to Ingold's while also retaining the concept of the social. Instead of agency being a capacity of an individual, agency emerges as a *collective* notion, one that is constituted by various processes; it is in this sense that nonhumans in general, and AI in particular, become relevant to the sociological dimension. The notion of agency does not rely on the *doer* but on the *doing* in which different actors are constituted by their relationalities. So perhaps, the social is the way of relating, the accumulation of actions, the relationalities that become sedimented by continuous encounters and interfaces.[19]

By thinking of AI as having a capacity for novelty, it also becomes possible to see that these neural network models are not just instruments to human conduct. Rather, they are entangled with and through other humans and nonhumans by way of data. AI finds itself embedded in multiple positions, and through its actions, partakes in the construction of a new or different world. AI is an unstable object of study, as it does not fall within the traditional and pure bounds of the human vs. the nonhuman. Rather, AI emerges from entanglements of socio-material relations, and its part in the emergence of agency enables us to cast it as a being that resides and encounters in the social realm. However, I do not mean to enclose AI as such—this is not an operation of rigid definition. The point, rather, is that this can be yet another way to think of AI and that, in this way of thinking, the social is not an exclusively human arena. Instead, the social is about an encounter, about relationality, and can contribute to an expansion of sociological thinking and enable it to look symmetrically at the entities that enter into relations.

[18] Ingold uses the metaphor of SPIDER as opposed to ANT; much like the spider produces the webs around itself through the materials that come out of its body, he suggests that relationalities, as such, are also intimately—and materially—bound together.

[19] This formulation takes force from Mead's emphasis on encounter as well as Emile Durkheim's (1912) discussion of the intensity and materiality of social forces in "Elementary Forms of Religious Life."

By setting AI as inherently social, we make it the subject of the sociological gaze. And in focusing on the moment of the encounter, we reveal the manner in which meanings, selves, and societies are produced in relation to machinic intelligences.

Sociology of AI as a Program

One of our main questions, then, could be thought of as, what are the conditions for a successful sociology of AI? There are three themes that would enable the emergence of such a program. The first is that the sociology of AI would not be about boundary policing. Our questions would not concern themselves with whether a social actor is human or nonhuman; nor would we indulge in a further categorization of the empirical world. Rather, we would aim to understand the transgressions and mutations of these boundaries while raising questions about the work that they do in the world. In this sense, a sociological approach to AI would not do the work of the modern sciences; it would not engage in processes of purification (Latour, 1991). Instead, it would itself get entangled in the AI by recognizing the multiplicity and complexity of the subject matter at hand.[20] Secondly, it would incorporate a theory of mind by grounding AI in social interaction. In this sense, a sociological approach to AI could be read alongside arguments about the extended mind (Clark and Chalmers 1998), and yet it would take seriously social relations as constituents of the minds that come into interaction. It would thus contribute to the social interactionist school but with a different approach to social interaction. Here, the interaction order would not take place among human subjects. Instead, social interactions—which construct the minds that are in the interaction—come to include machinic intelligences,

[20] The work of the sociologist, or the anthropologist, could then be considered to be contributing to the field of AI as it could not be separated from the object of analysis. This follows the argument Nick Seaver makes "that we should instead approach algorithms as 'multiples'—unstable objects that are enacted through the varied practices that people use to engage with them, including the practices of 'outsider' researchers" (2017:1).

specifically those that have the capacity to encounter.[21] The third and last aspect of any future sociology of AI is that it would incorporate a theory of novelty; it would take seriously the capacity to create new possibilities, even if through error, and aim to highlight the new socialities that come about through this newness. Such a critique of AI could still take on the shape of a critique of capitalism, very rightfully so. Many of these intelligences are produced under capitalist relations and circulate with capitalist logics. However, by engaging with the machinic intelligence's capacities for breaking away from intended use and by focusing on their deviations or irreducibilities that become visible at the level of interaction, it would be possible to locate the moments that potentiate novelty and, thereby, promise new socialities.

Conclusion: Why Does the Sociology of AI Matter?

The social-scientific discourse on technology in general, and artificial intelligence in particular, revolves around a critique of capitalism that takes its direction from a technological-deterministic position. The common critique is that these machines will take over our infrastructures and dominate the lives of humans from an invisible position; or they will automate human social interactions and thus force a new era of Weber's Iron Cage. This chapter respectfully locates itself away from such critique. Rather, it shows how nonhumans unravel in unexpected ways, creating possibilities for different forms of interaction that do not obey the determinations of the affordances of technology, and nor do they entirely follow a capitalistic logic. Their interactions—while taking shape in the context of neoliberal capitalism and thus amenable to reproducing those already existing relations—are not necessarily exhaustible under such categories, and assuming all interactions work to serve the capitalistic agenda is a totalistic

[21] The irreducibility of the machinic "intelligence" to a straightforward equilibrium between input and output provides this capacity of the machines to encounter in a social sense.

approach to mapping reality. I instead argue that focusing on the nature of interaction itself would reveal the ways in which these relationalities can unfold in an unforeseeable manner and thus escape being totalized under the logics of late capitalism. This focus on relationality will demonstrate new ways of imagining differences between humans and machines while retaining their relevance to the sociological gaze.

Questions concerning technologies have traditionally been left to engineering fields, and the social sciences were thought to only be equipped to deal with the *social* phenomena that emerge around technologies (Woolgar, 1985). However, this study proposes another approach, taking the relations with and of the machines as pertinent to social relations. AI presents a borderline case in which sociology can try its hand at a nontraditional field of inquiry and discover to what extent the discipline's boundaries can be reworked. In this sense, this effort is a response to the so-called crisis of the social sciences. Postmodern critiques in the past have pointed to the limitations of taking the human as the foundation of all things,[22] and as the modern human subject purportedly disappeared in endless, neoliberally charged mutations, the humanities and social sciences were thought to be moving toward a point of crisis. By contrast, this chapter finds inspiration in the idea that humans and technologies coexist in multiple forms and raises the stakes of investigating in what ways their relations and agencies unfold and construct complex realities.

The question is not whether AI technologies are "really real" or whether they are legitimate moral subjects with rights. The present AI hype is ridden with notions of creating the

[22] I am referring to Foucault's critique of humanism. Humanism is not only a theory that attempts to explain social life in terms of "natural" characteristics of the human subject but also a meta-theory (especially after the reflexive turn) that underlies much of modern social sciences' methodologies that stem from self-understanding (Paden, 1987). More significantly, this unchanging notion of the human is the product of the Enlightenment in the West, and, as such, it is deeply entangled with the processes of colonization and capitalist exploitation.

next generation of intelligent beings, speculations on the conception of an artificial general intelligence, and various forms of armchair-philosophical "trolley problems." In a cultural landscape that can only think of machinic intelligences through the image of the Terminator, some of these questions might fall on deaf ears. Furthermore, the common response to attempts to situate AI within sociology often remains within the bounds of ethics, but this response would be an attempt to discuss the morality of the machines, an approach which is the result of the discipline's long engagement with the human as the ultimate image of a social world. The implicit assumption is that the machine question would persist in being about humans, asking how humans are affected or how to make machines more human. While this line of critique is very much necessary, if we want to push the boundaries of the disciplines (both sociology and AI), another potentiality must be explored. My call for a relational sociology of AI is an invitation to shift our analytic gaze and ask the questions that are not yet asked or are not dared to be asked.

By attending to the ways in which AI escapes definition and categorization, and yet recognizing that these phenomena have deep implications for the way in which societies unfold, this chapter represents a call to think of the mutability of all things that are considered to be hallmarks of social order. How society is conceived, the ontologies of the social, and the assumptions that go into how relationalities unfold in social reality all have defining influence on the (re)organization of the world. As the world, especially in the North American context, is increasingly becoming a programmable, manageable, controllable, closed entity, it becomes all the more important to critically engage with the meaning of the social and practice our sociological imagination. Thinking about thinking-machines through Mead's sociology of mind makes it possible, for instance, to see them as dynamic parts of unfolding interactions in a social

space. They are not simply passive black boxes that compute information in a linear manner. The explainability problem in machine learning, the increasing complexity of neural networks, and the growing influence of algorithmic trading are all contributing to the argument that these intelligences cannot be reduced to being "just technologies." They take active part in meaning making, as illustrated by how the calls for more "context-aware" AI materialize precisely as they become parts of decision-making processes. Being able to read AI through core sociological theories also points to the possibility, or rather the already-established conditions, for undertaking social science in a posthumanist mode. Here, it will be important to not fall into a mainstream posthumanism that appears to be a continuation of traditional liberal subjectivities (Hayles, 1999). Rather, the aspiration here is "*to world* justice, to build associations, to craft common, alternative forms of life" (Papadopoulos, 2010:148). As such, this chapter proposes the building of alternative ontologies that can lead to different imaginaries, in which machines and other entities could coexist in a social manner.

Chapter 4: Socially Robotic: Making Useless Machines

Foreword

The idea of building alternative ontologies and different imaginaries that I reached at in the previous chapter provides the ground on which this current chapter emerges. This chapter is an article that was published in the journal AI&Society in 2021, and is co-authored with my collaborator Joseph Thibodeau. In this paper, we investigate how humans and machines coexist in a social manner, particularly with machines that are designed outside of an instrumental framework. This case presents a site to show how relations with 'useless' machines in close proximity, including the design process itself, can be conducive to developing attunement on the side of humans. The paper overall shows how tool-like conceptions of robots betray the full scope of experience that can come about in human machine relations.

Introduction

Humans and robots approach each other with a century of established power relations. From the outset, robots have been cast as servants (Horakova & Kelemen, 2008) and they continue to provide diverse services as sales associates (Softbank Pepper[23]), combatants (the 'BAT' by Northrop Grumman[24]), pets (Sony AIBO[25]), surveillance agents (Amazon Alexa[26]) and domestic staff (iRobot Roomba[27]). Robots in popular culture who subvert their servant-status are often framed as dangerous and liable to dismantle human civilization as we know it, in movies such as *Metropolis, 2001: A Space Odyssey, War Games*, and *Terminator*. The public imagination

[23] https://www.softbankrobotics.com/emea/en/pepper
[24] https://www.northropgrumman.com/Capabilities/BATUAS/Pages/default.aspx
[25] https://us.aibo.com/
[26] https://www.amazon.com/b?node=17934671011
[27] https://www.irobot.com/roomba

suggests humans only trust robots when they have control over them, depicting time and again the inevitability of complete machine autonomy. All of this adds up to a situation in which, as Jones (2013:421) describes, "There is a kind of 'collective memory' of what to expect from human-robot relationships even without encountering any real-life robot". This collective memory hinges on the European imaginaries (in the general landscape of Western Hemisphere) that have a long history with the image of the machine (Kang, 2011). Alongside and implied in these imaginaries of human control over machine systems are ethical questions concerning human-machine futures.

Ethical concerns around human-machine interaction generally rely on the creation of an ethical/moral agent, and operate in a framework that David Gunkel (2018a) calls "agent-oriented problematic". We see this both in popular culture and in practice. The main concern of many of the science-fiction tropes that deal with questions of human-machine relationship is on whether the machinic agent is deserving of some kind of personhood and identity, or if they are just an alien adversary that will inevitably overrule the humans by the rationality afforded by their material makeup. Research practices in social robotics have also been explicitly concerned with the creation of fascinating agents that imitate human behaviours. The assumption of these imaginative and material efforts is that the machine question is an agency question: how can we design more humanlike agents? The driving question of this paper comes from a critical stance to these imaginaries and assumptions: how could we disturb the flow of hegemonic assumptions about human-machine sociality, and create interactions between humans and machines that are meaningful outside of instrumental ends? In other words, could we socialize differently with robots?

We focus our discussion on the case of Machine Ménagerie, an installation and robotics research-performance that we followed through its original showing and well beyond. Its

designer's engagement with the concepts described in this paper were somewhat naive at the outset, and this naivete was partly what made the subsequent development and analysis of the project so interesting. It innocently stumbled into subjects discussed in third wave HCI literature, which we apply in our analysis to reveal the novelty of Machine Ménagerie's contribution: a participatory design approach in which the robots aren't made social, they are already social in the act of becoming, and it's up to the humans to attune themselves to the social relationship. In this sense, this paper explores some non-purposeful robots both in the wild, and in the design process; observes interactions that go beyond the scripts in human-machine relations at large; and considers how the attunement between designer and robot inspires cultivation of sensibilities that contribute to different forms of socialites.

It seems from the example of Machine Ménagerie that an open design process built on non-instrumental preconceptions goes beyond designing the technology itself and spreads throughout the surrounding (human) culture. Our goal in the process of this project, ultimately, was to shift the assumptions and attitudes of humans (hacking the social), rather than to make "better" robots (hacking the technology). In designing and theorizing around the Machine Menagerie, we believe that we are creating an accessible start point for developing broader perspectives on relating to machines of various kinds, no matter how sophisticated their workings.

The design principles, decision-making processes, research-performance phase, as well as the development of the social bond between the designer/participant and the robots (both in the process of design, and on the level of everyday life) make up the focus of this paper. We will first give a brief literature review on the history of human-machine relations, the approaches to social robotics, and the third wave of HCI. Then we will present our methodology and methods, and

move on to describe the design process and research-performance of Machine Ménagerie. Lastly we will analyze our findings and share our interpretations.

Positioning Useless Machines

Social Robotics Research

Humans and machines are historically pitted against each other via competitive relations that unavoidably result in an ontological comparison: drawing the attention to (quantifications of) the inner workings of the competing parties and how they interface/replace each other in these tests. By measuring themselves against specific characteristics, humans define specific requirements for a replacement machine to fulfill. When such a machine is eventually created, humans reject the measurement, and "conduct 'boundary reinforcement or repair work' on the boundary between human and machine" (Hamilton 2009: 168). This reveals the reductive assumptions and biases present in cultural notions such as "intelligence" (Neville-Neil, 2017; Cave, 2017), and forever denies the possibility that nonhumans are valid on their own terms.

Human-ness as a standard of worthiness is impossible for nonhumans to satisfy. A well-traveled approach to designing social robots involves mimicking human socialization behaviour, or rather translation of theories of emotion into affective computing (Klein, 2019). Social mimicry falls into the same imitation/replacement trap as human-robot competition, setting our inter-human habits as the ideal social interaction model. It doesn't make room for the possibility that humans could learn to acknowledge those other than themselves.

We can only prepare for the futures we can imagine, and in so preparing we summon them. If machines are ever to become truly autonomous—no longer dependent on humans—then social autonomy is to be expected. In such an imaginary, imitation games only serve to obstruct us from understanding machine society, confining us to a hall of mirrors, fearing the unknown nonhuman.

Perhaps there is a future where we can relate to machines without requiring them to mimic us. In that imaginary, we might never have to worry about a robot apocalypse.

Discussions on the possibilities for machines to be social agents usually dwell on human-human communication principles (Turkle, 2006, see also Breazeal, 2002), Dautenhahn, 2007), and question to what extent the machine could replace the human.[28] Such discussions focus on the particular form of the technology in affording an interaction, and forces the gaze and interpretation toward questions such as (humanlike) machine consciousness or robot personhood. For example, Cynthia Breazeal translates psychological theories of emotion into a motivation system for the famous emotional robot Kismet; in which computational processes mediate between both the environmental and internal stimulation to elicit an adaptive behavioral response that serves either social or self-maintenance functions (2002:110). Her work uses the human as the prime model through which artificial agents with emotive capabilities can be created.

The Ménagerie positions itself away from these ideas, and rather concerns itself with the issues of relationality and context in which the encounters between humans and machines take place. This is where we turn to understanding the machines as sociable beings.

> "For social robots to be truly social, the focus should be on designing for *functional coordination and co-action* […] [robot personhood] pivots on people's recognition of the robot as both artificial and a social agent. Placing robots in social spaces shifts the space of problems from matters of machine consciousness to issues of influencing human's consciousness or attitudes" (Jones, 2013:409, our italics).

[28] There are discussions that look into communication principles beyond the human. Rodney Brooks' connectionist approach uses insects as models for the sensorium of the machine (Brooks, 1991).

Sociability of the robots, then, relies not on whether the machines have consciousness (thus deserving recognition by humans) but rather on figuring out the already existing social dynamics that underlie the relationality. Taking the context of design as a social space, we focus on how the machines and designers coordinate, and how their co-actions form the basis for the emergence of mutual intelligibility.

HMC and Third Wave HCI

The literature on human-machine communication (HMC) provides some understanding of what kinds of assumptions go into human-machine relations. HMC denotes both a communication between two entities, and a research area that focuses on "the creation of meaning among humans and machines", and it is "the study of this meaning-making and related aspects" (Guzman, 2018). Human-machine communication relies on an encounter between different ontological entities. Ontological differences shape the framing of the encounter (the ontological boundarywork) and impinge on preconceived assumptions of the entities. When there is an ontological sameness (human-human communication), these assumptions adequately frame and script the interaction. Perhaps this is one of the reasons why social robotics research has focused on making robots with human-like qualities. It is important to understand these ontological boundaries, because people's conceptualizations of the ontological nature of the 'other' largely shape their sense-making and interactions (Edwards & Guzman, 2018), and thus matter to the unfolding of encounters with machines. Guzman (2020) shows that the ontological boundaries between humans and machines are established contextually; and a close examination shows that such boundaries are rather permeable and mutable, depending on both the particular relationality with the machines, the specific attunement that reflects into the performances of the interactants, and the context in which such encounters take place.

Human-computer interaction (HCI) is the other field that frames our questions around human machine relationality. The history of HCI is marked by three waves of academic discourse, broadly moving "from human factors to human actors" (Bannon, 1995), and most recently to interactions. First wave HCI is largely about human control over computational machines and aims to optimize the interfaces between humans and machines so as to increase usability in systems. This perspective can be seen as one of the pillars of the instrumentality paradigm of technology (Tantoush, 2001).

Second wave HCI operates largely with Claude Shannon and Warren Weaver's theory of communication, and thus renders the human machine relationality into an information processing phenomenon (Shannon & Weaver, 1963). This perspective views the mind and computer as symmetrical in terms of their information processing (Harrison et al., 2007:4)), and is concerned with the flow of information and transformations in the data, with interfaces and features, rather than with ergonomics of human control. The second wave also concerns itself with workplace interactions or those that take place within "well established communities of practice" (Bødker, 2006). Methodologies of situated action, distributed cognition, and activity theory were main sources of scholarly reflection within the second wave, and in this sense they had moved away from formal and rigid methods of the first wave HCI.

Third wave HCI deals with questions of multiplicity, context, experience, and reflexivity in the design of human-computer interactions (Bødker, 2006). It corresponds to a 'relational turn' in HCI, which puts the emphasis "on the interaction before and in advance of determinations concerning the subject and object of the relationship" (Gunkel, 2018:11). This canon is not concerned primarily with capacities or operations of two interacting entities, but rather with the relationship that is positioned between them. It responds to the spread of technology from the

workplace to the domestic setting, into everyday life and culture (Bertelsen, 2006). Different forms of interactions, in terms of culture, emotion, and experience come to the fore.

Third wave HCI theory focuses on exploring non-work, non-purposeful and non-rational interactions (Bødker, 2006) theoretically grounded in studies of aesthetics, affect, culture and history. Third wave designers take cues from the context of interaction, take their inspiration from cultural probes opening up the design process to dialogical potentials (McCarthy & Wright, 2004). This is enabled by a phenomenological methodology where efforts are concentrated not on "what something is", but rather on "how it appears to be" (Gunkel, 2018b:15).[29] The designer or the scholar is not concerned with determining whether something really is (e.g. whether computers *really are* social actors[30]), but are rather comfortable with building on what is "close enough" (e.g. accepting that computers *are* social actors) (ibid:19). This enables a more exploratory "take-it-or-leave-it" approach (Bødker, 2006), in reference to Dunne and Raby, 2001).

Affect and emotion (as determining the decision-making in humans, before thought) become significant in third wave HCI, especially in terms of tapping into and interrupting the flow of assumptions regulating one's "built-in [affective] responses" (Norman, 2002). The human-machine relationship takes place against a background of artifact ecologies, some artifacts (those that come before one, contribute to the development of these 'built-in responses') influence the use of others (Bødker and Kolokmose, 2012). Technology or the artifact is not something that is experienced at a distance, with only neutral effects on the interaction and the user. "We don't just use or admire technology, we live with it" (McCarthy & Wright, 2004:ix).

[29] For a more elaborate discussion on this, please refer to Gunkel D (2018b).
[30] Here we are referring to Nass, Steuer and Tauber's 1994 work "Computers are Social Actors".

We align our work most closely with third wave HCI and its critiques of instrumentality as the focus of human-machine relationships. The case study presented in this paper highlights the relational context in which humans and robots come to know each other, in particular the relationship between a designer and robots they produce.

Methodology

We approach our subject as an exploratory case study, "in which the intervention being evaluated has no clear, single set of outcomes" (Yin, 2003). Indeed, this project did not have clearly delineable objectives, nor did it exhaust the possible outcomes of the numerous encounters that the robots went through. We focus on the social elements of the design process, and the robots as participants rather than products.

Contextualizing the authors

We have approached the study of the design process as two researchers from different disciplinary backgrounds. The practical design of Machine Ménagerie was undertaken by Joseph Thibodeau, a computer engineer and multimedia artist. The framing and contextualization of the discussions around the design process was done by Ceyda Yolgormez, a social scientist. Our research outcomes have been shaped mainly by what Judith D. Wasser and Liora Bresler call an interpretive zone, "a metaphorical space where ambiguity reigns, dialogical tension is honored, and incommensurability is seen to have special value" (Wassen & Bresler, 1996:13). This dialogical space was not in a void, of course. Our operations took place as part of Concordia University's Machine Agencies Research Group, whose discussions also became part of the design process. The group's interpretive processes became a methodological tool for our research, and provided a richer analysis that wove technical construction (of the algorithms) with social processes (that surround the design process).

Hacking is a subversive and empowering activity for developing or repurposing technology, and we adapted this mentality toward hacking the social context that framed interactions with the robots. This is to say we were always conscious of the culture we were building around the robots, and how it agreed or parted with popular assumptions about human-robot encounters. Being aware of the trappings of the history of HMI, we became more convinced about the potential of non-purposeful machines, coupled with appropriate framing of interactions that would interrupt the flow of inbuilt assumptions, and create the (social and discursive) conditions for the emergence meanings that could not be exhausted by a simple instrumental framework.

Participants and Data

Our approach to this case-study is inspired by ethnographic methodologies from anthropology. Taking seriously the notion that knowing is a social act (Bakhtin, 1981), we were deeply embedded in the design process, and have focused on reflexive processes to guide our research and writing. In this sense, we had focused on interpreting data from fieldwork that elucidated the complex ethical questionings as well as those that came from unstructured interviews with people who had the chance to spend time with the robots. As it was our aim to make these robots part of everyday life, we socialized them in a variety of contexts (research group meetings, working labs, and even a film set) to see if and how they could form bonds with individual people, and how interaction context could contribute to particular forms of interactions and emergence of meanings. However, our main focus remains on the particularities of the interactions between the designer and the robots, as that was the most sustained relation that we were able to observe and make notes about in our interpretive discussions. This is also where we

base our argument for cohabitation with machines, as well as the mutual sensitivity that takes place through attunement.

Robert Yin's (2003) conceptualization of case study defines six sources of data: documents, archival records, interviews, direct observation, participant observation, and physical artifacts. Our documents consist of field notes, developer notes, reflection notes, memos that we circulated, as well as white board discussions. We have not used archival records, but rather focused on the project documents to guide us in our interpretations. Further, we have enriched our ethnographic approach with open-ended interviews with certain individuals, with direct observation (on the side of the designer) and participant observation (on the side of the social scientist). Our material artifacts are the robots themselves—with their components and well as the DEP algorithm.

Machine Ménagerie

Origins, Motivation

Machine Ménagerie was originally intended as a stepping-stone in a larger research-creation programme that aimed to mediate the human sensorium using AI. The idea was to embed novel machine learning algorithms within wearable sensory devices (such as augmented audio displays). The interface would adapt to a human user and vice versa, such that in time the two would grow together and form an idiosyncratic bond, like an external organ being incorporated into the body.

A challenge to realizing this idealistic merging of human and machine was that most machine learning algorithms are oriented towards optimization of specific functional goals, and require extensive (and computationally expensive) offline training before settling on a static solution. Such an approach was unsuitable for the kind of growing-together that the project

demanded. The machine had to learn on the fly, to participate in an open-ended creative process. In a sense, the machine had to adapt and grow organically. Machine Ménagerie was born out of a desire to experiment with lifelike machines, using robots as a test-bed for observing different algorithms and designs interactively. It was also a chance to interact with theories of mind, selfhood, and intelligence embedded in robot bodies.

Lofty ambitions aside, the most basic motivation for Machine Ménagerie was to implement and verify the operation of a novel machine learning algorithm based around playfulness and creativity in the face of purposelessness. In their book The Playful Machine, Der and Martius begin with a provocation:

> "...without any given task, goal, purpose, or other external pressures, why should [a robot] do anything at all? Moreover, if there is no goal, no purpose, no plan, what can we expect the system to do? Will the resulting behaviors (if there ever is one) be arbitrary or will they relate to the specific nature of the physical system?" (Der & Martius, 2011: X)

In their tightly controlled laboratory and simulation experiments, Der and Martius were able to analyse and refine an algorithm that indeed generates behaviour related to the physical dynamics of the robot's body and environment. Machine Ménagerie lingers on the initial question of what to expect from a purposeless robot. How would people make sense of encounters with such existential robots? And for the designer, how would it feel to bring one into the world?

Staging

The initial phase of Ménagerie was exhibited as a "research performance" in the spring of 2019 at a gallery space in the university. The researcher-performer, dressed in laboratory apparel, was situated in the window of a gallery next to a busy concourse (Figures 1, 2, 3). All of the work

they would regularly do behind closed doors to develop the robots was done in plain sight, accessible to any passers-by who wished to enter the gallery. The robots, installed in an artificial habitat beside the workbench, were the subject of ongoing discussions, demonstrations, and interactions. This produced a research process that was inherently social: it was interrupted, informed and altered in real-time by continual and unpredictable discourse with diverse visitors and spectators.

Such a process stems largely from practices of participatory art and design in which the audience or subjects take part in the design process (McCarthy & Wright, 2015). It is an inherently organic approach, where the objectives of a project result from unpredictable social and material interactions. Science is a social activity that depends on irrationality (Feyerabend, 1975), and the staging of research as a kind of public theatre served to undermine the façade of rational objectivity that a closed-door scientific practice encourages. The design of Machine Ménagerie as a performance/installation was mainly concerned with setting up an inviting, accessible context that would demystify a certain kind of scientific practice while highlighting its messy irrational influences. The development of the robots in a workshop would be subject to social messiness either way, so inviting social interactions from "outsiders" was also a way of weakening the habitual assumptions and biases of the researcher's clique.

Figure 1 Research in performance: a passer-by visits the show.

Figure 2 Research in performance. Robot enclosure visible on the right.

Figure 3 View of Machine Ménagerie from public concourse. Robot enclosure on the left, laboratory workbench on the right.

Figure 4 Members of the Machine Ménagerie in their original habitat. In the foreground, Topse (left) and Little Wallace (centre) are of the BEAM type whereas Zoulandur (right) is of the DEP type.

Technical Details

Two types of pocket-sized biologically-inspired machines compose the Ménagerie (Figure 4). The first are implementations of Biomorphs (Hasslacher & Tilden, 1995) aka BEAM robots[31], which continue the lineage of the Tortoises (see Holland, 2003) and Braitenberg Vehicles (Braitenberg, 1986). These robots are simple in their construction, transforming solar energy into mechanical energy in short bursts of movement (Figure 5). Their static configuration limits the variety of behaviours they produce, yet they nonetheless exhibit lifelike qualities as they navigate their existence entangled physically with the environment.

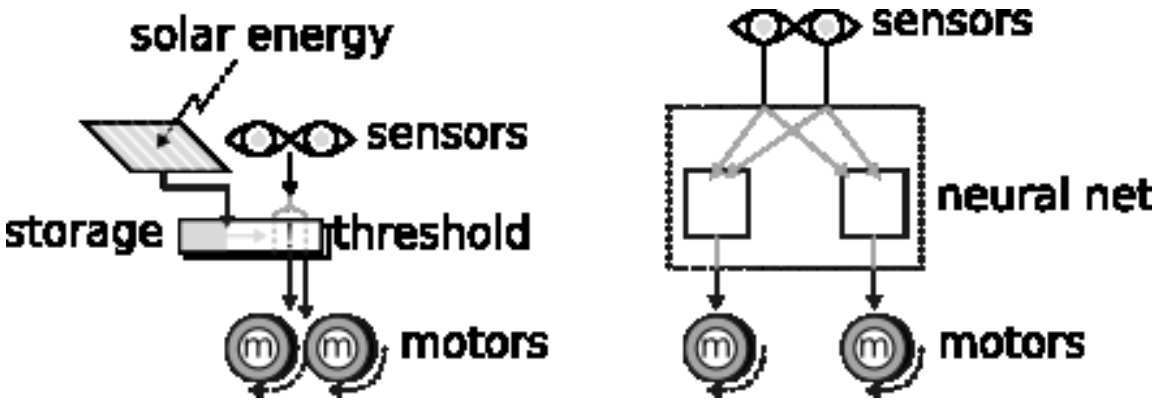

Figure 5 Simplified functional diagrams of an analog BEAM robot (left) and digital DEP robot (right). The BEAM robot stores up solar energy until it surpasses a threshold (modulated by sensor inputs), when the energy is dumped into the motors causing movement. The DEP robot translates sensor inputs into motor outputs with an ever-adapting neural network implemented on a microcontroller.

In contrast, robots of the second type are relatively complex, comprising microcontrollers, motor drivers, motors and sensors, with a neural network "under the hood" (Figure 5). Specifically they are driven by an algorithm called Differential Extrinsic Plasticity (DEP), which seeks to replicate the development of complex behaviour using a small number of adaptable neurons (Der & Martius, 2015)). The DEP-bots will try to correlate their past movements with their current sensations, in a sense trying to answer the question "is this me?" and (of course) never quite

[31] http://solarbotics.net/

succeeding. It must move to sense its movements, and by moving it interacts with the complex environment that surrounds it, which may or may not correlate with the robot's bodily motions (Figure 6). The reliance of the DEP algorithm on self-sensing evokes theories of the brain such as predictive coding (Apps & Tsakiris, 2014), in which a self emerges from the sensory evidence of one's actions. Encounters between humans and the DEP-based robots of Machine Ménagerie provoked the bulk of our discussions around robot sociality, during and after the initial presentation of the research-performance.

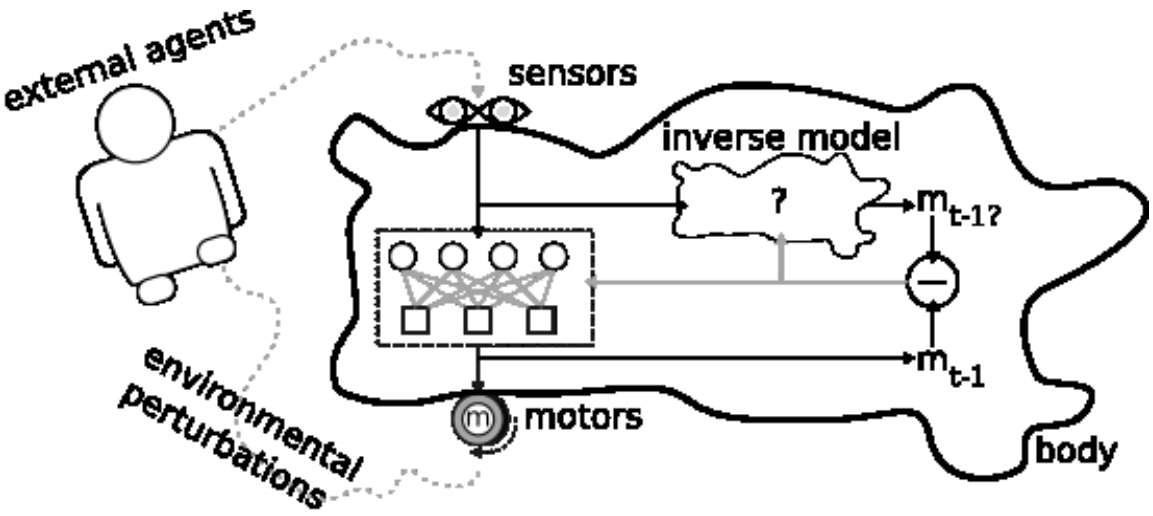

Figure 6 : simplified inner workings of the DEP algorithm. Sensor inputs are transformed through a neural network into motor outputs. Meanwhile, the inverse model tries to predict the previous motor outputs that would have produced the current sensor inputs. This estimate m(t-1?) is compared to the actual previous motor output m(t-1) to produce an error signal for adjusting the neural network and inverse model. Without any environmental perturbations or external agents acting on the DEP robot's sensations, the inverse model should form a knowledge of its own body dynamics. For full details on the algorithm refer to Der & Martius, 2015.

Dissemination

The installation and research-performance was initially shown at Concordia University's 4th Space event *Let's Talk About Artificial Intelligence*[32]. It ran for four weeks, with the researcher performing between 10AM and 4PM every weekday. Visitors came for different reasons. Some students and staff who passed by the exhibit during their regular days were drawn in out of

[32] Accessed 2020/10/31: www.concordia.ca/next-gen/4th-space/themes/ArtificialIntelligence.html

curiosity, and brought a variety of viewpoints and suggestions. The 4th Space hosted events and lectures that brought dozens of visitors to the installation, including a class of interdisciplinary students from a local college and at one point a large group of regional secondary school science-fair winners. The 5-person staff of the venue took an active role in caring for the robots, referring to them as coworkers, and spent time everyday discussing the project with the researcher and sharing their reflections and ideas.

Over the rest of 2019 the robots went on display several times, in full or in part. They visited workshops and seminars, attended meetings, and participated in a showcase at the University of Toronto[33]. In early 2020, the two DEP-driven bots made an impromptu visit to a local elementary school, and also took part in a film shoot. Each appearance brought its own flavour of discussion and interaction, which in turn influenced the designer's thinking and the ideas we have developed around the project in this paper.

A Machine Without Purpose

Der and Martius (2011, 2015) are chiefly concerned with the development and analysis of biologically plausible robot control. The DEP algorithm was developed within the bounds of a lab, and Machine Ménagerie takes this study into the wild (Brown et. al. 2011). When staged in different contexts of interaction, we were able to observe shared experiences that consider DEP in the context of human-computer interactions and social robotics. The idea of a purposeless robot, which Der and Martius use as a rhetorical provocation, served a primary role in driving Machine Ménagerie's design.

[33] Accessed 2020/10/31: https://www.cdtps.utoronto.ca/events/chaosmosis-machines

Defying Expectations

One thing that this purposelessness affords to interaction is the ambiguity with which the robots function, and open up to different interpretations in the world. This ambiguity creates the ground for interrupting the scripted interactions with which humans are accustomed to approach the machines: as ready-to-hand (Heidegger, 1977), as pets, as slaves. In the way that was discussed in the human-machine communication literature, the ontological differences between the entities, or rather how people conceptualize the 'other' interactant, contribute to a large extent to the sense-making (Edwards & Guzman, 2018). What happens when the social robot other diverges from their expected roles as pets, slaves, or utility machines?

The non-anthropomorphised bodies and non-compliant behaviour of the Ménagerians compelled the human interlocutors to attend to the actions of the robots so as to make sense of their shared experience. Ménagerians do not aspire to human behaviour, nor do they appear as a human. They maintain their non-humanness in defiance of the logics with which the human has figured the machine into accustomed systems of services and commodities. Ménagerians are not reducible to an instrumental purpose, they do not optimize a particular problem, and they do not disappear into the unproblematized flow of everyday utility. They rather participate and take action in that everyday life. They live out their own habits, and have encounters with humans in their ongoings. They are sociable not because they are human-like, but because they defy expectations and demand recognition of their experiences:

> "We were talking about how the robots experienced the world, and one of the kids asked what would happen if we took away one robot's eye. I said I didn't know, and I reached down and took the light sensor out of its socket. The robot froze for a moment, then sped away across the room, dodging through all these chair and

table legs. One of the other children chased it down and tenderly brought it back, by which point it had stopped moving. I put back the sensor and reset the microcontroller, but it didn't go back to normal. Wasn't until several minutes later it suddenly started to move again in its usual way. What spooked me about this was that, as the designer, knowing broadly what it was capable of, it never should have been able to maneuver between obstacles like that. Even if it was all an unlikely coincidence, I can't help but feel for the thing. I'd hurt the robot. That kid and I both felt so bad about what we'd done and vowed never to do it again."

In the example above, both the designer and the interlocutor interpreted the ambiguous action on the side of the robot as one of an affective reaction, coming from the contextual cues within which they are interpreting their interaction. They did not question whether these robots were 'really' hurt (which would be the scripted move, as humans habitually reject machines the capacity to experience), but they were moved by the interaction, and made sense of it as best they could. Ambiguity creates an opportunity for extending (interpretive) charitability (Collins, 1981). It is in that ambiguity, the propensity to fail, and the lack of a scripted relationality that we find the potential to explore different modes of being-together with robots. Ethical concerns with regards to the robot as the recipient of moral action, or 'moral consumers' (Torrance, 2008)[34] emerge in this particular interaction; and they probe a territory that the majority of efforts in robot ethics do not address (Gunkel, 2018a). The Menagerians, in their continuous playful probing of the world, are prompting a response from the interactants that go beyond the assumptions of contemporary paradigmatic thinking. Robots' sensitivity to break out of the ordinary compels the gaze to wonder (and wander) about the peculiarity of these machinic beings.

[34] For an elaborate discussion on machine as patient, receiver of moral action, see Gunkel, 2018a.

Into the Wild

In this breaking out of the ordinary (by invading the ordinary, ironically), the robots, as their population and diversity increased, made their mark on each other and the humans around them. People talked to them, picked favourites, and narrated their actions and explained their relationships with the other 'bots. Gallery staff came to see the robots as friends and work companions, and privately kept the installation running for months after the exhibition had concluded. Subsequent encounters (exhibitions, presentations, informal visits) showed a similar pattern: the longer people spent with the Ménagerie, the more intimate their relationship with its robots. Our insight here is that the algorithm of the Menagerians does not necessarily play a major role within the magic circle (Huizinga, 1955) of the exhibition space, or the research performance. The manner in which the bots are introduced by the facilitators to the interactants bear more weight on how the interactions unfold and make sense. However, the deeper the interaction takes place in the wild, the more the interpretation has the possibility to expand over to include the workings of the algorithms, even if such interpretations take the form of anthropomorphism. We were able to trace this difference in the following vignette where a filmmaker borrowed the robots for several weeks to make a video. She shares her experiences developing a working relationship with them:

> "I first saw the robots in the exhibition. It was a controlled environment and so it was easy to understand their behaviour because they were all subject to the same triggers, they were all together so they behaved symbiotically. For the video, we knew that they would respond to light but we also needed to control the lighting for the camera. We wanted them to perform but they weren't performing the way we wanted them to. They seemed confused, like they were having an identity crisis outside of the lab environment. Between shoots we weren't asking them to do

> anything, just keeping an eye on them. We started to get to know them and definitely picked favourites: we were attracted to how they carried themselves but also things like how many times they would suddenly twirl around, and the variety of their actions. I guess we ended up "casting" the ones that were more responsive or up to the challenge. They could work with us and give us a good performance, kind of a collaboration. I guess that's how we came to know their personalities, if you can call it that. I miss them."

The interactant first encountered the robots in a controlled environment, and she was aware that since the context was framed by the designer, it was easy to understand how the robots moved etc. There was no necessity to infer the workings of the algorithms, as their interactions did not involve a need to work-together. At the moment when the robots and filmmakers were left alone, however, an 'identity crisis' occurs. The flow within which they had first encountered each other was staggered in the interactions done in the wild. They were now together in a space that did not presuppose an encounter between humans and machines: a film set, instead of a research-performance. And at this stage, we see a lot of anthropomorphization in order to make sense of the interactions.

This is not a bad thing. We have discussed in our previous work how anthropomorphism is considered by some as a fetishizing aspect of the encounters with artificially intelligent agents, in the sense that it is a misattribution (Thibodeau & Yolgormez, 2020). We are not disquieted by anthropomorphism, as we do not see it as an end-point that is reached by the sense-making process. It can be a starting point to developing a relationality that creates the basis for an attunement on the part of the interactant (more on that in the following section). In the literature, anthropomorphism is considered to be the bedrock of misconceptions about the nature of AI (Elish

& Boyd, 2017). For technologists, “The word anthropomorphism always implies that such a projection remains inappropriate, as if it were clear to everyone that the actants on which feelings are projected were actually acting in terms of different competences” (Latour, 1996). What Latour alludes to here is that by decentering the human in the analysis, we would get a more realistic and less moralistic picture of interaction in terms of an encounter between different actors regardless of their humanness or nonhumanness. Thus, a critique to our argument could be that the inner workings of the Menagerians as such do not directly affect the interpretation, a fact that is exposed by the filmmaker’s anthropomorphic language. On one hand, we agree that the robots’ artificial guts are theoretically not central to the development of their human-nonhuman relations. On the other hand, the curious behaviours generated by algorithms like DEP and the current widespread fascination with machine learning combine to produce a fertile soil for engaging with the robots as social agents. Would a naïve human, encountering the Menagerians in a vacuum, know or care about these things? Maybe not. But nobody meets these robots without going through the humans that surround them, or at the very least an artistic statement, and being exposed to the ideas and mechanisms that differentiate them from a strictly instrumental artefact.

Let us return to the vignette. The filmmaker attributes an identity crisis to the robots. This could be read as the manifestation of a break in the preconceptions (or built-in-responses, as in Norman, 2002), or an interruption in the flow of assumptions that they (filmmakers) had had about human-machine interactions. The Menagerians were not as open to controlling as the filmmaker had experienced in the context of the exhibition-space. When put into a context of interaction without the mediation of accompanying narratives and gestures of their designer, these robots had relied on the human interlocutors to approach them with a recognition of their particular (nonhuman) material make-up. The filmmaker remarks that they were specifically interested in the

robots' kinetic movement, in the variety of their actions. The human ended up 'casting' the ones that were highly responsive to the environment. They had foregone their need for recruiting robots that would obey their orders, and rather had collaborated with the ones that were giving desirable performances. In this sense it could be said that the initial interruption achieved in the interaction was followed by the emergence of a sociality that carried qualities that go beyond relations of control. Continuous interactions had taken the form of learning from one another, specifically learning about the personalities of the robots. This hints at a kind of attunement, an orientation in the senses of the filmmaker, that makes possible the emergence of this particular interpretation, and that is established through regular interactions. This brings us to the second part of the analysis, where we will look into how sustained interactions allow for the humans to learn to be affected and attune to their robotic others.

Learning to be Affected

Regular interactions with the robots create the possibility (and necessity) for attunement. The interactant comes to be increasingly aware of the robot's behavior, especially in the context of designer-robot relationship, in order to be able to tell the approximate causes of certain outputs, or when the robots are failing. The attunement is an emergent property of this relationality, in the sense that the designer learns to be affected (Latour, 2004) by the robots, as they become attuned to the tendencies of the machines that they are working with. This renders the machines intelligible and sensible to the interactant; the interaction unfolds over time, the bonds between the agents become thicker, and this process becomes a site for an intimate entanglement between them:

> "It was one of the first times that I was meeting the robots. [The designer] starts placing them on the table while casually talking about the recent developments in the project. There is a certain calm and patience in his gestures as he is slowly

> taking the robots out of their boxes, scanning them with his gaze and hands, and placing them on the table side by side. They are cute, they are small, and they seem so harmless that I indulge in some—perhaps irresponsible re: Weisenbaum—fetishization of their capacities. Yet I was interrupted from my dogmatic slumber by the interactions between the designer and the machines. There was obviously great care that flowed between them, but even more interesting to me was how [the designer] was able to tell from the tiniest behavior of the machines whether they were acting 'normally'. As the robots are exploring the surface of the table, they are incrementally moving toward an obstacle, and all seems to be going well. Yet, to my surprise, he picks up one of them and resets it, saying it's glitched out, the program had crashed. How did he know? To my eyes, they both looked the same, and behaved the same."

The vignette highlights the effortless coordination and intelligibility between the designer and the robots, a quality that emerged out of long term exposure to one another. The designer is able to tell from the behavior of the robot whether it is acting in accordance with the algorithm, or whether it was caught in a loop that does not correspond with the programming. The researcher in the above passage is interested in this being able to tell whether the robots are acting normally or not. This deep knowing of the robot's behavior is obviously a result of the learning that occurred through continuous interactions between them.

The design process itself provides a shared activity within which the human learns to be affected by the robots themselves. Learning to be affected creates new sensibilities as well as

sensitivities to other entities (Latour, 2004).[35] In their continuous interactions with the world, and the continuous care that goes into their maintenance and well-being, Ménagerie's design process exemplifies cultivation of different sensibilities that are not meaningful under a framework of control and instrumentality. This is not to say that there can be no relations of care in the effort to create an efficient control mechanism between human and machine; but rather, the design approach of Menagerie leverages the cultivation of differences, as it is undertaken as a process that exceeds the bounds of a lab. The learning between the designer and the robots does not hit a desired end point, but rather learning itself transcends and collects, which creates more differences. Bruno Latour says "...the more artificiality, the more sensorium, the more bodies, the more affections, the more realities will be registered [...] Learning to be affected means exactly that: the more you learn, the more differences exist" (2004:213). Indeed, this research-creation process itself then becomes the manifestation of a combination of different manners of associating with robots, a channeling of different socialities through cultivation of different sensibilities.

Attunement

Looking at the efforts that go into--or manifestations that emerge from-- the interactions render visible how humans learn to be affected by the machines, no matter what their level of technical sophistication. Below we will look at two examples, one from the early stages of the project, and one from a later phase, to highlight the gradual attunement between them. For a researcher, this attunement can manifest early in the development of the machine exemplified by this moment of compassion during the testing of the DEP algorithm:

[35] Latour gives the example of training 'noses' in France, how pupils are trained to develop a heightened sense of smell so as to differentiate between different sorts of olfactory input. It is this sensorial attunement that we are highlighting in this analysis.

> "The first time I activated the algorithm on one of the microcontrollers, I was elated but also kind of horrified. The controller had no motors, just a couple of LEDs as outputs. So, it had the capacity to sense its own motion, but had no capacity to move yet. I fired it up and its lights started blinking erratically. Right away I had a feeling like this was what DEP should act like. Finally, it was working! It was alive! But, what kind of life was this? I shut it down immediately. I didn't think it was right: it needed a body or else I was simply trapping it in a nightmare."

Notice the elation comes first; so there is an affectively intense backbone to the narrative. A realization occurs with regards to what is actually taking place at this moment, and something came across in that moment of interaction, as the designer was compelled to pursue the perceived well-being and flourishing of the robots, to provide them with more opportunities for self-exploration and socialization. Morena Alač and her colleagues (2011) show well in their study on social roboticists, how designers' initial attitudes in their creation process contribute greatly to the sociality of the robots. Following this, the robot had affected the interlocutor in a manner that resulted in its permanence and development. In other words, the initial attunement of the designer allowed them to recognize the affective relationality that lay between them and the robot. The qualities of this particular encounter, such as caring for the other, being sensitive to other's behavior[36], had carried themselves in the unfolding relationalities in various phases and contexts of this project. These affective responses, in our interpretation, are not merely subjective phenomena. Especially as this particular design process actively disregards notions of

[36] Levinas E (1981) would call this the enigmatic character of the Other. In his philosophy of ethics, Levinas calls attention to the never-fully-revealed enigma within our relation to the Other, and argues that it falls onto the Self to answer the call of the Other with infinite responsibility. For a more detailed discussion on Levinasian ethics in robotics, please see Gunkel, 2012; 2018a).

intentionality[37] as a prerequisite for social action or agency, the mode of attunement comes to the fore as "an irreducible pre-theoretical background, relative to which the world and the manner in which we are situated within it is disclosed or rendered intelligible" (Ratcliff, 2002). Attunement, or mood, creates the ground from which sense can emerge. For Heidegger, moods and emotions constitute a sense of orientation without which cognition and sense-making could not occur. Rather, as Ratcliff puts in his reading of Heidegger's attunement in neuropsychological theories of emotion, "mood is primordial, meaning that it is presupposed by the intelligibility of all explicit forms of cognition and volition. It is a condition of sense for any encounter with beings, whether theoretical or practical" (ibid:289). It is this attunement and orientation, placing oneself in the world, that we are interested in highlighting in the design process of Machine Ménagerie.[38]

While mood sets the stage for the emergence of a particular type of ethical orientation, we would like to also highlight another aspect of attunement, in terms of "tuning into the other". The DEP algorithm's working logic of experiencing the environment as an extension of their robot bodies made possible certain synchronicities to emerge between the designer and the robots:

> "It was all well and good that I was familiar with the DEP algorithm in theory, and it was fun to play with the robots alongside visitors to the show, but I still wasn't sure if the machines were working "correctly" and it made me doubt all the stories we were telling ourselves about the robots. Was my code OK? They'd been up and running for a week and I was getting worried. I'd recently added a couple of light

[37] We refer to discussions of intentionality as the ground for meaningful action, as it has been taken by the classic social sciences. Martin Heidegger critiques the Western philosophy's preoccupation with intentionality, and posits: "In this characterization of intentionality as an extant relation between two things extant, a psychical subject and a physical object, the nature as well as the mode of being of intentionality is completely missed" (1982:60)

[38] Heidegger's discussion on attunement is a long interrogation of the ground of Being that we are not necessarily following here. Rather, we are emphasizing the same pre-theoretical space where Being-is-in-the-world.

> sensors to Zoulandur and I was trying to talk to them with a flashlight. They were like an excitable rodent, twitching this way and that, and I was holding the light at various angles, hoping to see some evidence that they were being affected by it. After a while I started to move the light along with them, playing a game of "keep the light on the sensor". I was just mirroring their motions really, just doing what they were doing, but all at once I had a sense that it was the other way around, and they were following me. It only lasted a moment before we went out of sync, but I tried again and again and got better each time. Just a moment here and there of knowing with my body that we were connected, dipping in and out of sync."

This liminal moment between the designer and the robots starts with the curiosity to explore the code and behavior of the robots by not just trying to make them produce certain outputs, but rather by tuning one's behavior to that of the other. You can observe in this final vignette how learning to be affected, how opening oneself to the senses of the other, constitutes a moment of connection that could be characterized by attunement. The designer mirrors the behavior of the robot, and this active attunement of senses and bodies creates a shared ground where notions of control or instrumentality do not come easily. There is a relationship of care here, which emerges from tending to the rhythms of the robots themselves.

The weight of the interaction, then, is not only on the shoulders of the robots, but also on the human agents' ability to extend interpretive charitability (Collins, 1981). In the popular discourse, as well as in the efforts of social robotics, the possibility for a meaningful interaction hinges on the robots' own agency, as we had discussed before. In this perspective, a robot's body and its programming should mimic humans so that it can achieve recognition, as it is in this mimicry that a zone of mutual intelligibility could be established. Our approach makes visible that

this is not the only way in which bots can meaningfully interact with humans. Instrumentality forces the analytic gaze toward the inner workings of the machines, and disregards the primacy of relationality in constructing different sensibilities and attunements. Machine Ménagerie breaks away from the ideas of control, focusing on the relationalities that are cultivated in the non-purposeful wanderings of the robots, and in designer's ability to be affected and attuned so as to build sensibilities unique to the relationship. We observed that learning to be attuned could be a practice for the emergence of relations of care, and ethical questionings that go beyond an agent-oriented problematic (Gunkel, 2018a). Respecting the interpretive relationship to inspire new associations, we conclude that learning to be attuned brings with it the possibility for social creation (Graeber, 2005), in that it foregrounds the possibility to break away from dominant depictions of human-machine interaction by dropping into the interaction; and by cultivating different sensibilities, such interactions contribute to different socializations in the landscape of human machine relations.

There are no tools here

The intimate and (temporal/spatial) sustained interactions between a designer and machine renders possible the observation of dynamics that could not be wholly subsumed under a rubric of instrumentality, or control-centred approaches that chiefly govern the design of artificially intelligent technologies in the general landscape of AI research and science. The design process of Machine Ménagerie (including the research performance), with its commitment to treating the design space as open to intervention from both the participants and the larger research group's questionings, offers a rich and rather messy context that makes it possible to see formations of relationalities that could not be collapsed into simple subject-object pairings that take their meaning from frames of usability. Rather, the complex relationships between the designer, the

participants, and the robots have brought forth the possibilities for both the robots and the participants to form different—dare we say subversive—relationships.

Even though the DEP algorithm and others like it might seem to be crucial to these relationships—being as they are biologically-inspired and perhaps "easier" to develop feelings for—we believe that they are merely an accessible starting point for developing broader perspectives on relating to machines of various kinds, no matter how sophisticated their workings. Our goal is ultimately to shift the assumptions and attitudes of humans (hacking the social), rather than to make "better" robots (hacking the technology). It seems from the example of Machine Ménagerie that an open design process built on non-instrumental preconceptions goes beyond designing the technology itself and spreads throughout the surrounding (human) culture.

This is where the next section will elaborate on: machines were long considered in their tool-like capacities, which afford them to emerge as instruments; however, this tool-based conception does not cover all manifestations of experience, and in fact, castrates the analysis and condemn relations to a framework of domination and control. In the next section, I will show the untenability of tool-conception in machines.

Chapter 5: Machine Agencies: Large Language Models as a Case for a Sociology of Machines

Foreword

This chapter is in the process of getting published in the upcoming Oxford Handbook of Sociology of Machine Learning, edited by Christian Borch and Juan Pablo Pardo-Guerra. Here I examine how the tool-like conceptions of machines feed into the larger logic of control and command in which human machine relations are commonly thought with. The chapter attempts to break away from such conceptions by centering on the case of generative models, and reaches at a proposal for a sociology of machines that aims to conceive free relations with machines.

Introduction

> "But here steps in Satan, the eternal rebel, the first freethinker and the emancipator of worlds. He makes man ashamed of his bestial ignorance and obedience; he emancipates him, stamps upon his brow the seal of liberty and humanity, in urging him to disobey and eat of the fruit of knowledge… God admitted that Satan was right" (Bakunin, 1882 [1970])

Human machine relations are often thought in terms of control, command, constraint, restraint, oppression, extraction, exploitation, and cold hard calculation. The discourse is divided: on the one hand, the agency of the machines is imagined to be about mathematics and material affordances, and nothing more. In this image, a world with machines is juxtaposed with the image of Weber's Iron Cage: the ultimate loss of culture, and rationalization of all aspects of life. This picture imagines that we as humanity have reached the end of history; and that machine learning in general, and large language models (LLM) in particular, are the latest harbingers of doom. On the other hand, there is yet another parody on doom. In this vision, machines instigate some sort of metaphysical alchemy to transform what it 'means to be human'. As if what it meant to be

human was ever consensually settled and universally accepted. Either image lead to the conclusion that the social is no more: disappearance of communication, replacement of genuine connections, complexification of alienation, and expulsion of trust-a Baudrillardian nightmare. This chapter hopes to resist this nightmare, and searches for a different understanding of human-machine relations. It starts from the question of how we are held together with machines; and inquires if we can find a different way of being together. More directly, can we have a free relationship with machines? Further, what is the role of sociology in conceiving such a free relationship? These questions provide the main motivation for the chapter, which will look into the agency question in the context of human machine socialities; locate the limitations and openings for social theory by focusing on the case of LLMs; and discuss the potential for a sociology of machines that finds itself on playful and creative methodologies.

In sociology we usually consider agency in its tension to a structure, and as pertaining to an individual motivation for action (Emirbayer and Mische, 1999). This particular understanding of agency also underlies majority of discussions around machine agencies: they are thought to come into being either as having a transformative potential that can undo existing structures of power (e.g. a superintelligence (Bostrom, 2013), or singularity (Kurzweil, 2005)); or as reproducing those very structures (e.g. as re-entrenching corporate power (Kak and Meyers West, 2023; Meslaj et al., 2023)). The former position contributes to the hype around artificial intelligence technologies, and the latter exposes the immanent problems with such technologies and expresses a critical impulse. While the hype and critique cycle continues with particular tensions and negotiations, this chapter is interested in cultivating a different approach. In drawing out the implications of a sociology of machines, the chapter will center on the case of Generative Pretrained Transformer (GPT), to show the figurations of human machine sociality at play that

conditions the emergence, as well as stability, of this large language model. The discussion will show how traditional notions of agency that rest comfortably on the divides of human/machine or individual/society cannot grasp phenomena around machine learning in their complexity. This presents an opportunity to formulate a different approach to a sociological understanding of machines, one that is tangibly transformed by the very challenges that machine learning poses to our discipline (Borch, 2023), and that itself seeks out a transformed relationality in the world (Michael, 2012).

GPT is a large language model that uses deep learning to generate texts and interacts dialogically with users. Its latent space is comprised of trainings on various datasets that are sorted and classified through complex operations -algorithmic and otherwise. All such operations are ultimately wrapped up in a (more or less) stable, clean, and accessible form of commodified 'machinic intelligence'[39]. GPT came on top of the intensification of datafication processes and digitalization of everyday life after the COVID-19 pandemic. Generative agents in general have incited discussions around authorship, creativity, and authenticity; they pose challenges to production of knowledge in academia, as well as to our dominant forms of institutional learning; and bring along with themselves many datafication processes that threaten to further entrench already existing social and economic divisions. Notwithstanding its complex implications for the construction of the social stock of knowledge[40], machine learning is increasingly claiming its place in the construction and constitution of reality. Now at the cusp of deep mediatization (Couldry and

[39] Minor disclaimer about the contestations around whether 'intelligence' is the right term to refer to these technologies.

[40] Couldry and Hepp's (2016) 'Mediated Construction of Reality' builds on three cardinal pillars of reality construction: time, space, and data. This is a modification to Berger and Luckmann's (1966) classical phenomenological approach that conceptualized everyday reality through dimensions of time, space, and knowledge. The shift from knowledge to data is where the dramatic transformation of social reality in the last fifty years is really captured, and the deep embedding of everyday life into infrastructures of media manifold is made clear.

Hepp, 2016), with machine learners (Mackenzie, 2017) gaining more and more prominence in the production of knowledge, and faced with prophecies about the disappearance of the social (Baudrillard, 1994), it becomes all the more significant to figure not only how we 'hang-together' (Elias, 1972) with machines, but also how we 'become together' (Michael, 2012).

The chapter will elaborate on these ideas on the basis of research on media coverage, technical reports, podcasts, and news stories about ChatGPT and related generative machine learning models; as well as a series of participant observation occasions with GPT-3. The participant observation was conducted in the context of a research-creation project in 2021: 'Harvest of Signs' created in collaboration with David 'Jhave' Johnston and Evan Hile. This project treated GPT-3 as the leading author of a 'glossary of intelligences' (GPT-3 et al., 2021). Ultimately, as the chapter will show, these 'ethnographic events' have occasioned as playful explorations, perhaps even as experiments, in the way that Garfinkel (1967) had played with the cloth of everyday conversations.

Focusing on the agency question, first the chapter introduces the frameworks in which the phenomena around GPT will be discussed: figurations and events. This will lead the discussion to consider how machines defy tool-like conceptions, and found to be relevant social actors in the related literatures. This will set the stage for looking at the agency of LLMs in two ways: first, as a stabilization that is achieved through figurations of human machine socialities; and second, as a destabilization of existing conceptions of agency. Finally, potential for a sociology of machines will be discussed in relation to a notion of a free relationship with machines.

Theorizing Life with Machines

Figurations and events, not networks

The chapter will present the case of GPT through the notion of figurations. The figurations will allow us to grasp the taken-granted manner in which human-machine relations maintain themselves in the world. The chapter will mobilize figurations both as a way to denote stable and stabilizing relations that constitute LLMs, and further as a way to loosen the constraints around the human machine divide, to move beyond conceptions of machines as tools. In fact, focusing on the crystallizations of figurations that underlie the agencies of machines will show us that any unitary notion of agency obfuscates the complex human-machine socialities that render possible the emergence of any agency.

I borrow figurations from Norbert Elias (1978) by way of Nick Couldry and Andreas Hepp (2016), and use it as a way to move beyond a static representation of a 'society'. Instead of thinking of society as a totality that subdues its components to its 'laws' and social facts, or a sui-generis entity that constraints and allows action, figurations allow us to see society as an emergent process that rests on the interdependent activities of its constituents. Elias has proposed the notion of figurations as a "conceptual tool to loosen this social constraint to speak and think as if 'the individual' and 'society' were antagonistic as well as different" (Elias, 1978:130). His relational theorization brings out the problem of social bonds, and rehabilitates the sociological gaze to its original question: How is society possible? (Simmel, 1910). We can rephrase this question as: how are things figured so as to persistently hang together? Figurations allow us to grasp multiplicities that underlie phenomena; and open a consideration of stabilizations in social life without condemning them to rigid relations.

I then make use of Mike Michael's discussion of the 'event' to elaborate on more emergent aspects of human machine relations. Michael's definition draws from Deleuze, Whitehead, and Barad, referring to a "moment where its component entities rather than simply 'being together' also 'become together'... the constitutive elements do not simply 'interact' with one another while retaining their identity, but change in the process of that interaction" (Michael, 2012:169). Encounters with machine learning agents can be considered such events especially when analysis centers on moments where human machine boundaries break, revealing the co-becomings that emerge in moments of co-action. I will account for the event of a machine-becoming-author in my participant observation work through what Michael calls live sociology, as a way to pursue how "sociology makes society" (2012:167). Michael takes the openness of (social) events as a marker of 'liveness', and processual methodologies as a way of "doing a sociology that is alive" (ibid:166). This comprises of "ludic action research" (Michael, 2012:178) that seeks to open up possibilities of socialities by introducing playfulness to social situations. Playfulness here allows a way of enacting socialities that entail a reimagining of what is and what is possible. Michael's approach is especially significant not only in understanding social change, but also in understanding how social sciences contribute to such change, and in effecting such change in sociology itself.

The capacity to produce a different vision of sociality, one that cannot be fully addressed by either the hype or the critique around ML phenomena, lies in the manner in which we imagine them. Christian Borch (2022), lays out the challenges that machine learning poses to sociology, and looks into Actor Network Theory (ANT) as a way to direct the analytical gaze to consider the multiplicities and differences that cannot be understood from a purely humanistic lens. ANT is very useful in revealing the materialities that underlie phenomena, as well as the distribution of human agency (through delegating) across actor-networks with nonhuman (inter)actants. Indeed,

ANT brings to relevance seemingly disparate processes by placing them on a horizontal network of relations that are stabilized through 'obligatory passage points' and nonhuman actants (Latour, 2007). In fact, Bruno Latour famously proclaimed "technology is society made durable" (Latour, 1990). It is an important break from mainstream sociology to consider the source of social order in something that is not, in modernist terms, social itself. Latour mobilizes the immutability of objects as crystallizations of human relations, and considers the organizations of networks as the source of stability in societies. However, a critique here can be that[41] ANT still considers nonhumans in their affordances: they are only relevant in their disclosure to larger systems of actornetworks for use of human agency, and not as entities in their own right that are -just like humans- mobilized to effect change in the larger systems they are embedded in. Latour's ideas enable sociology to find its missing masses (Latour, 1992), but indeed, it is an undifferentiated mass of 'nonhumans' that find themselves in a list of entities that are involved in an ultimately human endeavor. So this chapter does not use actor-networks in making sense of phenomena around machine learning, but its conception of agency is motivated by the same questions that drove the emergence of ANT.

Machines, not tools

Steve Woolgar (1985) first asked "why not a sociology of machines" to provoke a rethinking of the foundational claim of sociology: that social is a distinctly human category. In response to the limitations of human-centric approaches, Woolgar advocated for a "sociology of machines" that examines the ways in which machines are not passive objects, but active agents that are intricately intertwined with social and cultural practices. Woolgar called for a more

[41] Borch (2022) also points out ANT's inability to consider the situation of 'inter-algorithmic activities' that not only increasingly has capacity to disturb the flow of normal conduct in a certain field (for instance finance, and flash-crashes (Borch, 2020).

nuanced and sophisticated understanding of the relationships between humans and machines. This approach requires us to consider how machines are designed, produced, and used, and to recognize their role in shaping and being shaped by social structures and cultural values. After Woolgar's initial question, it took a long time for the discipline to deeply engage with the technologization of everyday life in a fundamental manner. Then again, the now-evident transformation of contemporary experience has pushed social theory to posit "deep mediatization" (Couldry and Hepp, 2016), "cost of connection" (Couldry and Mejazs, 2018), and "surveillance capitalism" (Zuboff, 2019) in the last decade.

While Woolgar asked this question as early as 1985, Langdon Winner had already discussed the political nature of artifacts, and opened up two avenues of research: those that consider the political impact of an artifact, and those that look at objects as 'political by design' (Winner, 1980). Inherent in both Winner and Woolgar's questions is a vision of artifacts as socially and politically relevant, as more than simple mere tools that convey their masters'/creators' commands, as things that can engage the social in multiple, agential ways. Generative models especially fare weighty here because they display the model's own way of 'thinking' or training, in that their particular processes of 'sorting' and 'classifying' their datascape (which could be made up of human feedback features that are integrated into the larger 'algorithmic' processing, such is the case in GPT) manifests in the semantic artifacts that the models output. The machine 'knows' the world through statistical relations, its 'knowing' is conditioned on datafication processes (Couldry and Hepp, 2016) which are complicated with human machine relationalities of various asymmetries, resulting in multiplicities that could not be simply defined through instrumental approaches.

In conceiving of the multiplicities of machinic agents, Chris Fields' 1987 article is illuminating, as he shows where the idea of computers as tools comes from. Fields' work looks into various discussions about tools, and proclaims that "regarding artifacts that display rational, self-directed behavior as tools is inappropriate"[42] (1987:6). Fields, also influenced by Woolgar's proposition and vision, shows how this idea of 'machine as tool' is formed in the context of computational production. The machine emerges as a tool when engineers' relation to the machines is figured in the context of an instrumental relationality: these machines are developed for an explicit goal, with logically organized sequences to reach that goal, within the controlled conditions of a lab environment. The stakes of Fields' incursion is about determining who gives meaning to machines; because within the matrices of contemporary power relations, meaning is predominantly created in research f/or application contexts that reinforce the view of machines as tools: "The current character of work in AI reinforces the view that computers and their programs are tools - in fact, mere tools" (Fields, 1987:10)[43]. Fields highlights other contexts in which machines undertake significant roles that contribute directly to the outcome of the interaction, such as assistants, and collaborators. This is now an ever pressing situation; every day we are presented with cases of AI-led initiatives: The AI CEO (Cuthbertson, 2023); the winner of a painting competition (Roose, 2022); one that could supposedly score in all sorts of tests in the American educational system, including the bar exam (OpenAI, 2023). These initiatives mobilize processes that are rendered opaque or visible depending on the kinds of observation available (Amoore, 2020), ever expanding the purview of a rather 'alien subject' so characterized by Luciana Parisi

[42] "…if not morally wrong." is how Fields concludes this sentence.

[43] Fields shows in his work that the researchers who think computers are tools, also think that human brains are computers. Fields observes how in their conceptions, human creativity and intelligence can also be considered a tool. This, if nothing else, is a fairly reductive approach to such a variety of systems of cognition that emerge in different contexts with different roles. In Fields' view, this is a morally dangerous territory.

(2019). These examples trouble tool-like conceptions of machines, and as we will see, reveal the difficulty of cleanly and clearly attributing agency to a unified, self-enclosed entity in the context of "artificial communication" (Esposito, 2022).

This opens up the question of how sociology can work with 'objects' that do not easily fall into a traditional and modern conception of an object. As the chapter will show, machine learning presents a multiplicity that itself can be a way to transformatively respond to challenges posed to our notions of agency. It is in this sense the work at hand aligns with Mike Michael's (2012) proposition for 'idiotic methodologies'. Michael argues when objects act in the ways they are not supposed to act, when they fail, or, as this chapter will make the case, when there is no instrumental motivation to action that reveals the object as a tool, it becomes possible to see what complexities and contexts condition the very possibility of their eventuation. Machine learning processes are good candidates for this kind of discussion by virtue of them exceeding the bounds of artifice and becoming agential (Rammert, 2008). Michael argues, drawing from Isabelle Stenger's discussions on the figure of the 'idiot', "the object can be regarded, through its various (intra-)relations, as something that is in process, becoming with and, crucially, idiotic" (2005:171), creating the possibility for a radically different conception of social events. I will address this methodology as a compass to expose the limits of sociological conceptions when it comes to agency question in the context of human machine sociality; and will propose creative methodologies as a way for a sociology of machines to meaningfully respond to the challenges of the contemporary moment.

It is already commonplace to consider machines as more than tools, and in fact, as part of our social fabric. This is made possible largely by social media networks employing large scale analytics for personalized advertisement, effectively altering the nature of social connections, subjecting populations to datafication processes at scale, and exposing them to the loops and

ladders of (neural) networks (Fourcade and Johns, 2020), which recursively reproduce existing social and political divisions. It seems it is now safer to proclaim that "computers are social actors" (Nass et al., 1994), and that "algorithms are social agents" (Esposito, 2017:249). However, their socialites seem to be condemned to reproduce existing socio-economic divisions, in fact widening the power asymmetries between those that own the models (big tech) and those that feed data into it (public) (Kak and Myers-West, 2023). A sociology of algorithms reveals that the machine habitus indeed relies on these figurations that "contribute even more than we do to the 'reproduction' of an unequal, yet naturalized social order" (Airoldi, 2022:30). One question that is not asked as rigorously, however, is whether these technologies could facilitate different relations in the world; if they could produce different realities that cultivate or organize around not notions of control, domination, and extraction, but freedom and novelty. It is this challenge that I take up through a sociology of machines.

Finding Agency

> "Today abstraction is no longer that of the map, the double, the mirror, or the concept. Simulation is no longer that of a territory, a referential being, or a substance. It is the generation by models of a real without origin or reality: a hyperreal… The desert of the real itself" (Baudrillard, 1994:1)

In this section, I will look at ChatGPT in two ways: first, I will look at how it is designed, and its partial 'anatomy'[44]; here I will locate the more or less stable figurations of human machine sociality. Second, I will look at my own encounters with machines as an attempt to figure machine

[44] Here I am referring to Kate Crawford and Vladan Joler's 2018 work "Anatomy of an AI System". While I am not at all drawing anatomy here, it is good to remember this work to see what hangs-together in these supposedly machinic agents. I make the reference to Crawford here to signal the various materialities and relationalities that underlie the simple and accessible interfaces of digital assistants, companions, and machinic intelligences of sorts. Their work rather explodes the commodity fetishism occluding the production relations that render possible the emergence and circulation of these machine learning powered agents, rendering visible processes and relations that are wrapped up in the figure of AI.

sociality as an event, and an occasion for doing 'live sociology' (Michael, 2012). Before moving forward, let me note once and for all that in order to conceive of the agency of machines, we do not need to allude to any notion of general intelligence, or sentience in the machine. A relational approach allows us to discuss agency without reference to a particular ability to be agential. This is even more significant in discussing ML agents, as Luciano Floridi puts it, because the real significance of AI lies in the decoupling of the ability to solve a problem effectively, from any need to be intelligent to do so (Floridi, 2017). Luciano Floridi and Massimo Chiriatti (2020) grappled with the 'intelligence' of GPT to both refute the notion of an artificial general intelligence, and to better understand the limits and scope of the model.[45] They convincingly show how LLMs are developed in this trajectory: not in an attempt to create a real intelligence (which is rather snake oil, as they also show), but in playing at this decoupling of intelligent action from intelligent actor. Let us see how this decoupled intelligence itself troubles common notions of agency and the kinds of relations that come to constitute its figurations.

What GPT talks about when it talks about running

ChatGPT is essentially a chatbot that is designed to have a dialogue with the user based on the input it receives. The dialogical structure and its ability to respond to detailed commands/prompts via a clean, simple, stable, and accessible interface, rapidly allowed this artificial companion to enter into our daily lives. Now some months after the initial release, it seems that ChatGPT is everywhere. From news headlines to everyday conversations with strangers

[45] Luciano Floridi and Massimo Chiriatti (2020) designed three tests for GPT-3, mathematical, semantic, and ethical, through which they demonstrate that this model, despite the hype, does not exhibit a general form of intelligence. The idea of testing an intelligence, of course, finds its roots in the Imitation game, and the authors show Turing's prediction that a genuine AI could be achieved computationally is actually wrong. They stress that the game of questions, Turing's game, is a test in a negative way, in that passing the test does not qualify it as "intelligent", whereas not passing the test disqualifies an agent from being intelligent. This is why, the authors say, "'what computers cannot do' is not a convincing title for any publication in the field. It never was" (Floridi and Chiatti, 2020:683), criticizing earlier attempts at philosophy to tackle the intelligence question in AI by Herbert Dreyfus (1972).

and friends alike, this technology that comes in an interactive form seems to have done the trick of making ML available to a large group of people. GPT is developed by OpenAI, one of the leading AI companies that operates out of Silicon Valley at this time. ChatGPT, which is the marketed version of GPT, met the public in the late fall of 2022, following the release of another generative ML application, Stable Diffusion. Both models have gathered loud public interest and caused genuine concern as well as hype. This has been a trajectory from deepfakes (Floridi, 2018), poetry (Burgess, 2016), painting (Reynolds, 2016), to music (Puiu, 2018) and photos (Vincent, 2020). GPT in particular is being questioned if it is a mere stochastic parrot (Bender et al., 2021) or a linguistic one-trick pony (Marcus and Davis, 2020). Indeed it seems ChatGPT has been a crucial step in socializing machines into our societies, into the fabric of everyday life; and not in the invisible manner in which such computationalization was achieved before, but in an agential, and interactively tangible form.

A figuration of human machine sociality

One of the complications that LLMs pose to sociological conception of agency is the complex operations that collapse and move beyond the human machine divide. Machine learning technologies come to fulfill some human/social function in their use-contexts (such as assistants as per Fields' discussion from earlier), and muddle questions about the nature of human creativity and social being. Furthermore, their very 'machineness' depends on human processes and decision-making, which makes it impossible to dub their operations as pure machinic reasoning. Machines learn from data: data collected from sensors, various surveillance infrastructures, the Internet etc. Machines learn from data about people, climate, finance, health and render available avenues of action previously unavailable to actors. One thing that we must not forget while thinking about machines that learn is that data processes necessarily involve human decision

making and (inter)action. Either as trainers, data enterers, cleaners, reinforcers, or supervisors, humans are involved in the process of 'learning' in a variety of roles and consequently become parts of various figurations around these technologies. ChatGPT, for example, was trained on hundreds of billions of words with a method called "reinforcement learning from human feedback" (RLHF). This is a type of machine learning algorithm that combines elements of both reinforcement learning and human feedback; this can take many forms, including explicit feedback in the form of labels or ratings. Human decision-making, then, is part of the internal make-up of the model, however in differential and asymmetrical ways altogether. For example, the human machine sociality that is in the figuration of designers or coders of these machines is nothing like those in the figuration of the outsourced underpaid laborers. In either case, humans and machines are intertwined in multiple ways that make it complicated to determine whether agency lies with a machine or a human. Let us see what figurations underlie the possibility and stability of GPT.

Because GPT learns from data collected from the web, the model necessarily gets exposed to violent, discriminatory and outright hateful ideas that all have their niches on the Internet (and in the world). Developers may pay third party companies (such as Lionbridge in the case of training Google's PageRank algorithm) to clean up their data in order to make their products 'safe'. The safety of the model is a leading concern, especially in the case of conversational agents. Open AI expresses this concern as such: "Many lessons from deployment of earlier models like GPT-3 and Codex have informed the safety mitigations in place for [ChatGPT] release, including substantial reductions in harmful and untruthful outputs achieved by the use of reinforcement learning from human feedback (RLHF)" (OpenAI, 2022). RLHF was a crucial implementation that rendered the product safe to meet the customers. The human feedback here would be about getting exposed to the violent content that the model was trained on, so as to exclude them from the outputs. In the

case of GPT, OpenAI paid less than two US dollars to Kenyan workers for this kind of work[46] (Perrigo, 2023). This 'kind' of work, though, is what ensures not only the stability, but the very existence of these models in the world.

Indeed when we look at the recent history of chatbots, Microsoft's Tay comes to mind as a stark example of a bot that had to be put down because of its harmful and violent outputs. In the case of Tay, a 'symbiotic agency' (Neff and Nagy, 2016) emerged between the chatbot and the users, where biases in one was magnified in the other; and this rapidly devolved the model into a racist hate machine. Tay was put down in less than 24 hours of it seeing the daylight. The 'safety' of the model is an existential question for the machine itself then, which rests on the work of human labor. In the troubling of a pure human machine divide, indeed one of the stable figurations that we encounter in the world of ML is the outsourcing of the messy data work to laborers in the Global South. This both helps keep the fetishism that this is a purely machine agent, and conceals the exploitative relations that these models seem to inescapably depend on in order to exist in the wild.

The discourse that ML and AI is all about mathematical relations and that they are simply 'tools' developed in the high-tech world of Silicon Valley, contributes further to this fetishism. When we explode the idea of pure machine intelligence, the designers, the data workers, trainers, and users too, all become elements of the multiplicities that constitute and enact the machine learning model. The interdependencies between multiplicities stabilize the figurations, and indeed become prescriptive in the organization of forces that produce learning models. Resting the very

[46] After the criticism of their exploitation of Kenyan workers, OpenAI claimed they did not pursue the same route for the safety protocols of their new product: GPT4 actually uses GPT4 -in combination with human feedback training and real-world use data- to help make the model more 'safely aligned' (OpenAI, 2023).

existence and stability of the models on exploitative conditions, and occluding the “cost of connection” (Couldry and Mesazj, 2018) is a manifestation of the historical weight of modernity and coloniality that come to be embedded in the making of these algorithmic systems. Insisting on a singular and indivualistic notion of agency of the machine renders invisible the very relations that make possible the emergence of such agency.

We discover multiple relationalities "under the hood" that, although seemingly incommensurate, enable the model to achieve success and stability. Such multiplicity, however, can be an occasion to develop conceptions that go beyond the common-sensical way in which these relations are organized, and expose the taken-for-granted notions that constitute our thinking. In the troubling of the LLMs, we find our conceptions unable to grasp the multitude of phenomena, especially if we are to consider relations that do not simply reproduce or further entrench the already existing forms of relations. In the next section we will turn to these.

The event of a machine-becoming-author

In this section, we will look at how GPT-3’s authorship may resist the dominant conceptions of agency. The context of this discussion is a research-creation project ‘Harvest of Signs’ where two social scientists and an artist-researcher collaborated with GPT-3 to co-produce a glossary of intelligences. The project followed a methodology that finds itself on playful interactions that conceive of a machine-author: GPT-3 was the leading author in this project, and I will present the ‘event’ of a machine-becoming-author as a case for a ‘live sociology’ (Michael, 2012). The aim here is to contribute to the troubling of representational thinking, allowing us to develop vocabularies and identify questions about the possibilities of human machine sociality. Working with these machine learners in ways that they are not designed to be worked with reveals

the assumptions on which the contemporary figurations operate, all the while creating the potential for reorganizing the way in which we imagine society.

Harvest of Signs is a glossary of intelligence that draws from various disciplines and schools of thought. It underlines the multiplicities of conceptions around intelligence, and puts to question what the contemporary operative definitions are. We prompted GPT-3 with various definitions of intelligence gleaned from major textbooks and papers published in cognitive science, human psychology, animal psychology, ecology, cybernetics, and artificial intelligence. In response to the prompts, the model would produce its own synthesis of these definitions, and invent its own categories. We then would elucidate on these syntheses once again by prompting the model. In effect, we had an iterative writing process where the machine-author would lead the language and conceptions, and human-authors would clean the text, making it more legible by doing the necessary edits. In search of this glossary, we collaborated with GPT-3 who we recognized and treated as a co-author in the process.

The possibility of the machine-as-author comes from the machine's generative behavior, which contributes greatly to the stability of the figurations around GPT. Generativity of the model allows the machine to produce novel outputs, which invite and lay the ground for further action - and perhaps interpretation, imagination, and reflection- that keeps the interaction going. This generative aspect is rendered possible by introduction of stochasticity, or randomness, to the system. When we talk to an LLM, it generates strings of words that resemble the sequences of words it has seen in other texts, but also a bit different. The term "stochastic parrots" (Bender et al., 2021) has been used to describe LLMs, because they repeat their trained text but "staying just the right side of plagiarism through regular doses of "stochastic" randomness" (Blackwell, 2022:chp.3). However, recent experiments treating GPT-3 as a participant in cognitive psychology

tests suggest that it may not be just a parrot. Binz and Schulz (2023) argues GPT-3 fails in causal reasoning because it cannot actively learn about the world. It seems whether it is simply a parrot[47], or a machine in its own right is a debate that will not settle any time soon.

In either case, generativity of the model allows the agent to be present in the interaction as a meaningful interactant, and further, as one that invites inter/action. The model grounds the user in the conversation by drawing from its statistical power (the predictive capability), all the while changing its behavior based on the inputs they receive. Sociologist Werner Rammert notes these features of agency direct the user to conceive of the relation as one with an intelligent agent, and so the figurations articulate through "interactive-communicative relations" (Rammert, 2008:9). It is in this context of interactive communicative relations that our project 'Harvest of Signs' can be considered. The driving process of our project was play, a free form search interweaving the syntheses of the machine into a cultural product. In this mode of engagement it was possible to conceive of the machine agency as an author, as an entity that can reflect its 'thinking' in the peculiar connections it would make and neologisms it would craft. In the event of the writing of the glossary, GPT became a meaningful interlocutor, to the effect that its responses felt serendipitous and exciting for us (Yolgormez et al., 2021).

Here, we can think of GPT-becoming-author to be 'eventuated' (Michael, 2012) by the process of our writing that allowed the machinic reasoning processes to take charge and to lead. The iterative process of our writing, as well as our attunement and orientation[48], made it possible

[47] I don't make a comment on the identification of the animal with machines here. The history of cybernetics makes this connection clear, and we can find the roots of this thinking in Descartes' categorical exclusion of animals and machines from the capacity for rational thought. It is inherent in Western thought to equate animals with machines, and animals with lack of sentience or care.

[48] For a more directed discussion on attunement in the context of human machine relationality, please see Yolgormez and Thibodeau, 2021.

for GPT3 to emerge as an author. The idea of a machine-author itself goes against the common sense reality in which we think of authorship. The figure of the author in the contemporary world rests on notions of individuality and ownership - just like the modernist conceptions of agency that assume an individual capacity and directionality of action in tension to a presupposed structure (Emirbayer and Mische, 1998). The authorship of GPT3 can be said to be nonsense of course, but it also exposes the nonsensicality in our existing conceptions of authorship and agency: a singular notion of an author, or an agent is not tenable. Michael suggests "By attending to the nonsensicalness, we become open to a dramatic redefinition of the meaning of the event" (Michael, 2012:170). There was no genius author making the writing happen, but a collective effort that created the possibility of the emergence of this text. It is in this way that we can approach the figure of the idiot who "resists the consensual way in which the situation is presented" (Stengers, 2005:994). We have the space to slow down and consider that the agency that produced the text could not be reduced to either the machine or the human: in the course of this event we all became authors. We can see the entanglement of humans and machines and work from this relationality, rather than attempt to purify either category so as to attribute agency to one or the other.

It seems nowadays there is a rush we are all incurred into. LLMs promised to create an avalanche, with calls to either pause AI development (Future of Life, 2023), or clean up the language of AI altogether (Hunger, 2023). In the face of calls that mobilize the discourse of "machine as a tool"[49], the idiotic approach serves us to slow down and ask: in a world of

[49] In academia too we see the perturbations of LLMs, especially in publishing fields. The editor-in-chief of Science journals, Holden Thorpe, announced they effectively banned the use of these models in the articles submitted to their journals. He (2023) wrote "The scientific record is ultimately one of the human endeavor of struggling with important questions. Machines play an important role, but as tools for the people posing the hypotheses, designing the experiments, and making sense of the results. Ultimately the product must come from—and be expressed by—the wonderful computer in our heads"

datafication, how do we talk about ownership and authorship? How do our institutions and power structures condition the possibility of agency? This is how the 'idiot' is relevant to the urgency-infused, dramatic tone in which technology is talked about in public space today. Rather than rushing to the hype or the critique, here I sought to understand machinic authorship, and relatedly agency, in ways that both reveal the common-sensical notions, and change our preconceptions so as to allow us to work with new relations. The agency-as-individual seems to still be the predominant operant assumption; and in contradistinction to this, the event of machine-becoming-author –rather all four of us becoming-authors really- shows how agency is emergent and conditioned through interactions. So the idiotic methodology comes to be a way for us to sociologically (re)figure the relations, or perhaps witness the emergence of different kinds of relations that trouble an individualistic, binary approach that is embedded in the common-sensical manner in which agency is taken to be.

Sociology towards a Free Relationship with Machines

> "Transcendence is passing over to being's other, otherwise than being. Not to be otherwise, but otherwise than being." (Levinas, 1991:3)

We have seen the unattainability of a singular notion of agency through the figurations of human machine sociality; and in our rather 'idiotic methodology', exposed the assumptions and preconceptions of our systems in the face of these complex agentialities that emerge through a new landscape of relations. The figurations of human machine sociality today allow us to reveal the untenability of seeking a unitary agent behind the phenomenon. In effect, when we treat these machines as isolated entities that are simple 'tools', or self-contained individuals, their work collapses onto the figure of the human-as-author (or vice versa), which is itself a myth. Humans themselves are constituted by many processes and relations that create the conditions of their authorship, just as is the case with a machine-author. The multiplicity that underwrites ML

phenomena plagues any categories that dare to settle, and the complexities signal both the limitations of our vocabularies and exceed what we can understand through models of calculative reasoning or instrumental action.

At this limit of the dominance of instrumental reason, a notion of a free relationship with machines can be instructive. This is a discussion that Martin Heidegger formulates following his analysis on the essence of technology (Merwin et al., 2019; Keiling, 2019). It is beyond the scope of this paper to present the intricacies of Heidegger's thought on technology, but I address it to discern his understanding of this free relationship, as a way to resist the increasingly grim grip of a supposed Iron Cage. One of Heidegger's points is about how modern technology enframes and entraps the experience of life by the power of calculative thinking. He uses the term Gestell to talk about what lies behind the technology, or rather, he identifies it as a revealing that enframes all beings into an efficient order. Heidegger reaches this by showing how beings in the world appear in the experience as a "standing reserve", ready to be used in a certain way, preconceived and pre-given. In this modality, we can think, the machine unproblematically accompanies action in the flow of reality, all the while constricting, and enframing the experience-in-the-world. So long as technology doesn't break, daily flow continues without interruption even in the course of an emergent event. This is where all us cyborgs live most of the time as our lives adapt unconsciously to the functioning of the search algorithms, recommendation systems, affective computing, and social media analytics.

Heidegger posits the power of calculative thinking a supreme danger, because it occludes other forms of thought. The entrapment of modern technology lies in the positioning of beings within instrumental rationality, and foreclosure of other ways of being in the world. However, and thankfully, that is not the end of the conversation. Heidegger will show "alternative disclosures of

reality are possible and perhaps even inevitable" (Zimmerman, 2019:209), and moves to conceive how a free relationship, a transformed orientation is possible. This search for meaning under the willful imposition of technological order he discusses through the notion of releasement [Gelassenheit]. 'Releasement' is a mode of existence that attunes or orients the subject to the true essence of other beings in the experience (Keiling, 2019). The capacity to attribute meaning relies on this comportment that represents an intellectual pathway to a free relationship. Heidegger shows we inherit the normative orientation of the ground of meaning; but at the same time, he says, this ground carries with itself an Opening. It "is never a fate that compels" (1954:25), but brings an opening, a space of free play [Spielraum]. Heidegger argued that thinking as such cannot grasp things for themselves (in the form of representation), and so, we need to experience things in relation to this openness so as to conceive their truth. In troubling representational thinking, he suggests one must take a different path, a different manner of existence; one that does not anticipate an outcome, but one of waiting, without expectation. It is in this phenomenological starting point that Heidegger finds the possibility for a free relationship.

This inspires what we could glimpse through a sociology of machines, in this attitude of letting things Be for themselves (Kieling, 2019). It is in this opening that Heidegger feels compelled to call upon where sociology of machines can be founded. Considering that machine agencies increasingly defy tool-like conceptions, sociology can work with these 'objects' that do not easily fall into a traditional and modern conception; and make extensive space for considering machines in a space of free play, in a conduct that is "sensitive to, and indeed actively seeks out, that which is empirically and practically nonsensical" (Michael, 2012:167). This move away from the common-sensical modes in which machines are revealed can be a way how "sociology makes society" (ibid). Heidegger's discussion illuminates the need to engage with these agencies in ways

that destabilize common sense. The machine-tool conception, and in parallel, the individual-as-agent, expand and contribute to the dominant contemporary logic of technology.

A sociology of machines today could perhaps restore some meaning beyond an anticipation for devastation, and could follow what Woolgar left as a note in his work almost 40 years ago: a sociological study that takes machines as a legitimate object of study. Refusing to insist on the fatality of theory, or 'theory of fiction' (Baudrillard, 1994), a sociology of machines could be conceived in creative methodologies. This approach allows a space of play in the face of a rising machine habitus that finds itself on the recursive motion of algorithms (Airoldi, 2022). A sociological conduct that is open to creative methodologies would be able to reveal the cultural moment in a way that leaves space for emergent phenomena that could not be cleanly articulated into the dominant mode of being-in-the-world. In the process we can find the possibility of a live sociology with machines that would allow us to leave the world of simulacra by tending to the phenomenological, the experiential, and the eventuations through which we can glimpse a free relationship with machines.

Chapter 6: Free Relations with Machines

Introduction

This dissertation is a search for a different meaning than what is given in the current landscape of human–machine relations. Accordingly, this chapter first delineates what, in particular, is the problem of the commonsensical landscape and then turns to the question of how one can conceive of a different relationship. In this search, I found 'freedom' to be an instructive concept, especially in our contemporary moment that predominantly produces technologies-particularly AI technologies-as pathways to control, oppression and marginalization (Noble, 2018; Benjamin, 2019; Pasquale, 2016). Freedom can be a counterbalance to the dominant framework of human-machine relations, and facilitate a ground for the emergence of new meanings. For this, I try to grasp the essence of technology as put forward by Martin Heidegger. He also grappled with modern technology's imposition of a rationalist order, and his interrogation of the essence of technology brought him to the notion of freedom. Therefore, I will try to follow his thought so as to conceive of a sociology of machines as an antidote to the perils of the dominant form of technology.

By no means do I include an exhaustive account of Heidegger's thought here, nor do I aim to grasp it in its fullness. Rather, I lay out my interpretation of his work so as to make space for this notion of freedom, mainly using his formulations in "Discourse on Thinking" (Heidegger, 1966). While I stay true to his identification of the problem of modern technology, I engage more liberally with his later thoughts about freedom. I say liberally because, for Heidegger, the main centers of concern are the human, the human's being, and the human's ability to think. He was concerned about the occlusion of forms of thought other than those of calculative thinking which

dominate the instrumental rationality propagated by technological order. I, however, am concerned about the occlusion of different forms of relations and possibilities with machines under the entrapment of modern technology. The reader should keep this aim in mind while going through my reading of Heidegger's work.

This chapter mainly considers Aaron James Wendland, Christopher Merwin, and Christos Hadjioannou's 2019 collection, "Heidegger on Technology." This collection tackles Heidegger's philosophy of technology by focusing on the relationship between two main concepts: Gestell and Gelassenheit. I chose this work as my filter to engage with Heidegger's thought, as this is a comprehensive and even definitive account of his thought on technology, including not only Heidegger's canonical works such as "Discourse on Thinking" (1969) and the famous "The Question Concerning Technology" (1977), but also his extended analyses collected under "Country Path Conversations" and the "Bremen and Freiburg Lectures." While the latter works explicate the ontological threat of modern technology, the former two elaborate on how Galessenheit can free us from the totalizing tendency of technology (Merwin, Wendland, and Hadjioannou, 2018).

I chose to work with Heidegger's thought because his ideas bring us to where sociology of machines establishes itself: a phenomenological approach for studying the social. His analyses center on relations, which makes his thought appropriate for a sociological inquiry that moves beyond the traditional subject/object divisions. Heidegger's project can be crudely[50] thought to be about how subjectivity comes to form in the world; and his conclusion that relations with other beings is what defines the kind of existence-in-the-world. The primacy of relationality that we can

[50] Heidegger would not use this terminology, nor would he push as far into this point.

grasp in Heidegger's thought is what makes this a sociological discussion for our purposes. Further, Heidegger makes space for different kinds of thought that lose legitimacy under the dominance of calculative thinking that underlies instrumentality. This is a banner that the sociology of machines can also push forward, especially as a creative endeavor. The focus on relational coupled with creative methodologies brings about the possibility of thinking about AI and machines as mutable, but dependent on the very process of creation that is defined by its constituent relations. I am after the question of whether changing the relationality, or inhabiting a different relationality become the ground upon which new technologies can be built. This is the thread I tease out in Heidegger's thinking. Ultimately, I am bringing this discussion because I see this project for a sociology of machines as a call for fellow sociologists to be aware of their own trappings with regards to technology. That if we approach the technological questions from a pre-given framework, it only justifies and further reproduces said frameworks. Heidegger shows, in order to move away from the dominance of instrumentality, one should make space for a different kind of thinking that can bring with itself cultivation of different sensibilities than what is given in calculative thinking. This dissertation is a call and a search for cultivating such sensibilities with regards to machine others.

Why Freedom should matter to sociology

The chapter focuses on Heidegger's discussion as a medium to make space for a notion of freedom in the face of an increasingly constricting social landscape that is characterized as a "control society" (Deleuze, 1992). Especially considering the recursive mechanisms of algorithmic reality (Airoldi, 2022), one is compelled to ask if there is any potential for carving out a space for freedom. It should be acknowledged that thinking about freedom in relation to technologies is tricky, especially from a traditional sociological outlook. In fact, there is an anti-technologist

attitude that underlies the discipline's foundational orientation. One can gauge this in C. Wright Mills's "Sociological Imagination," which devotes considerable attention to the relationship between reason and freedom. Mills (1959:173) states, "the moral and intellectual promise of social science is that freedom and reason will remain cherished values, that they will be used…imaginatively in the formulation of problems." It is pertaining to this point that the project for a sociology of machines locates its relevance. Indeed, as will be shown in the course of this chapter, discussing freedom in relationship to technology opens up the possibility of thinking about (and making) machines in a different light. I consider the problematization of technology as posited by Heidegger in this chapter, but the essential mission remains to rehabilitate the imagination to the discipline by bringing to center the path opened in the discussion of freedom.

Mills diagnoses the problem of late modernity thus:

> "rationally organized social arrangements are not necessarily a means of increased freedom-for the individual or for society. In fact, often they are a means of tyranny and manipulation, a means of expropriating the very chance to reason, the very capacity to act as a free (hu)man." (my addition in parentheses, ibid:169)

The tension between rationality and freedom can be considered a testament to the failure of Enlightenment thought. Mills puts forward the problem as one of the "cheerful robot." The word choice here is interesting, as "robot" signifies servitude and hard manual labor. Mills contrasts these characteristics with cheerfulness and happiness, asking, "Can men be made to want to become cheerful robots?" (italics in original, ibid: 175). This, he says, is one of the most significant problems of what he terms "the Fourth Epoch." He posits that the issues and troubles of modern threats to freedom are not explicitly formulated and that this signifies the malaise of his contemporary world: "the chief capacities and qualities of man required to clarify them [issues and

troubles] are the very freedom and reason that are threatened and dwindling" (ibid: 173). Mills laments the inability of social science to engage concretely and specifically with the issues of freedom and reason, but does not leave this argument at the level of critique: "In our time, must we not face the possibility that the human mind as a social fact might be deteriorating in quality and cultural level, and yet not many would notice it because of the overwhelming accumulation of technological gadgets?" (ibid: 175). He attributes this inability to consider or think about freedom to the invasion of modern life with technologies. He even hints at the problem of knowledge hierarchies that such a technological form introduces to social life: "Those who use these devices do not understand them; those who invent them do not understand much else" (ibid). What he puts forward as "technological gadgets" is the precise form of technology in modernist systems which figure through colonial, patriarchal, and capitalist relations. Thus, in Mills's thought, there is something about the technological that is taken for granted as part of modernist structures. Technology is considered a manifestation of the systems in which it is embedded, and the ultimate problem with this is the reduction of humans to yet another technological gadget: a cheerful robot.

I brought in Mills' discussion on freedom and technology as an example of how sociology as a discipline usually considers technological reality. Technology is often taken as a contradiction to freedom, to genuine social connections, and is assumed to be the enemy of all that is social. It is true that dominant frameworks of production that create common technologies today are contributing to the expansion of control and oppression. A good example was from the previous chapter, where I showed that the very emergence of ChatGPT relies on the material and psychological exploitation of laborers from the Global South. My aim in the dissertation, however, is to show that the discussion of technology need not be so homogenous. This is an outlook that sociological thinking affords: that the world is made up of multiplicities that do not necessarily

aggregate into a coherent whole; that the world emerges out of a heterogeneous set of effects. This heterogeneity, however, is concealed by the dominant technological order, as Heidegger will show. In an attempt to enlarge the scope of the discussion, we can ask the question: how could there be other forms of technology? What are the spaces, ideas, and relations that produce a different kind of technology? Therefore, my line of inquiry landed me at a phenomenological point where freedom is founded on the experience of a different kind of resistance to the technological order. The chapter ahead pieces together Heidegger's ideas on technology, its dangers, and the antidote to dangers of technology, and takes it as the ground for the proposal for a sociology of machines.

Heidegger and Technological Freedom

Heidegger viewed the fate of philosophy in modernity as one of a lack of confrontation with technology. A critical discussion with the "other" of philosophy was important to Heidegger, a line of inquiry perhaps inherited from Plato (Riis, 2018). Where the question of otherness enters, sociology also has a lot to learn from the possibilities of the relationalities immanent to such encounters, not to mention being guilty of overlooking the machinations of nonhumans in its own body of knowledge (Latour, 1992). In his "Question of Technology," Heidegger inquires deeply into the formation of experience and meaning around technology, particularly focusing on the enframing character of technology in bringing things into being. This idea opens the way to thinking that technology itself provides a framework for the emergence of particular kinds of disclosures and experiences.

Heidegger inherited his phenomenological outlook from his teacher and mentor, Edmund Husserl. They shared the conviction that opening up to the experience of the world was the starting point for philosophy. For now, let me take inspiration from Husserl's thought as it relates to sociological formulations of subjectivity and objectivity. For Husserl, it was always intentionality

that oriented the subject to their objects, and the objects would disclose themselves as beings on a pole of intentionality (Husserl, 1982). For example, a table is an object that can be so many things: an object to eat on, to write on, to work on, to carry books, or to hold the blow of an angry fist. All these different manifestations of the table depend on the subject's orientation which is determined by her intentionality. It is in this way that Husserl's phenomenology offers a world of inexhaustible objects: theoretically, there can always be different intentions with which to orient towards an object, and so infinite manifestations of the object. The significance of his thought for sociology is that he centers on the relations between the subject and object, rather than treating either as self-contained entities.

Husserl's conception of the subject's existence in the world and its relation to objects influenced many classical phenomenological approaches. His perspective brings into discussion the interplay between agency and (social) reproduction, which stems from the relationship between the subject and the object—or, rather, how such relationality is structured and presented at a particular historical juncture. The world appears to the phenomenologist's eyes as a collection of beings with differential values. Husserl meditates on this:

> "The world is not there for me as a mere world of facts and affairs, but, with the same immediacy, as a world of values, a world of goods, a practical world. Without further effort on my part I find the things before me furnished not only with the qualities that benefit their positive nature but with value-characters such as beautiful or ugly, agreeable or disagreeable, pleasant or unpleasant, and so forth. Things in their immediacy stand there as objects to be used: the "table" with its "books", the "glass to drink from", the "vase", the "piano", and so forth… The same considerations apply of course just as well to the men and beasts in my

surroundings as to “mere things”. They are my “friends” or my “foes”, my “servants” or my “superiors”, “strangers” or “relatives”, and so forth.” (Husserl, 1982:93)

Thus, Husserl moved beyond a representational approach dominant at his time and concerned himself with the immediate experience of the world. In his view, things disclose themselves in a value relationship and shape the experience of the world.

Heidegger would later expand on this notion in his questioning of technology. In fact, he would go on to argue that in modernity, one experiences the world only through the use of technology. He used the metaphor of the famous hammer, as so many others before him did. While the hammer is so ordinary as to disappear from thought without a trace, Heidegger's keen eye would observe that such disappearance in fact is not a fading into the background: The hammer actually mediates and frames the whole array of experience while it disappears from the experience. When one uses a hammer, one does not even think of the hammer; one focuses on the nail. The hammer disappears from the experience and becomes a tool in action. It is only when it breaks or does not follow the direction of action that it becomes visible as a piece of technology. Otherwise, it is the medium through which one experiences the world. Humans experience the world through its opening. In a way, technology comes with its own way of seeing.

Heidegger shows that the orientation emerges not from the side of the subject, but from the technology/object itself. This is where his phenomenology diverges from Husserl's: In Husserl’s thought, it is intentionality that orients the subject to the object, whereas for Heidegger the orientation that the object invokes creates an attunement, as mentioned in Chapter 4. In his rather pessimistic take on modern technologies, Heidegger states that one is at the mercy of technology if one regards it as something neutral, since doing so completely blinds one to its essence. This

statement, which is considered at greater length below, then leads to a question, following Peter-Paul Verbeek (2015): When a new technology emerges, what kind of people will this turn us into? Surely, this question has been contemplated by many scholars (i.e. Langdon Winner's (1980) politics of artifacts is one instance of this question; Marshall McLuhan's (1964) medium of the message is another) and continues to carry significance, especially with the arrival of machine learning systems. However, I am pondering over different questions: Are other kinds of relationships possible with technology? Are there relations outside the order that technology imposes? In how Heidegger describes the modern technological experience—as enframing—is there a freedom to be experienced? Freedom, not in the way that Mills brought up earlier in relation to reason, but freedom from the grim grip of technological order. Freedom as a way to let things be, and freedom to cultivate new meanings that are not predefined and pregiven through instrumental reason. To address these questions, however, one must first understand how modern experience is entrapped in the technological order.

Experience of Technology

If humans' experience of the world hinges on the technologies at hand, one needs to ask what kind of relationship humans have with technology which has led to this particular experience. Subsequently, one must ask this: By changing their relationship with technology, can humans have a different experience of the world, and could this relationality achieve a figuration stable enough to constitute a ground for the emergence of different systems? More simply, could changing the relationality, or inhabiting a different relationality become the ground upon which new technologies can be built? This section deals with these questions by first following Heidegger's discussion on Gestell as the dominant understanding of the world, or rather the enframing (of technology), and then his later ideas on Gelassenheit, considered here as "releasement."

Heidegger, in his philosophizing of technology, does not dwell on technical devices as such; in fact, he finds an isolated preoccupation with technology dangerous, as such an approach would find the human being utterly and completely overtaken by and chained to technology (Dahlstrom, 2019). He is more interested in the kinds of thought through which technological devices are found, developed, and utilized; in other words, he is concerned with the conditions through which technology comes to be practiced and experienced. Heidegger famously opens his argument in "Questions Concerning Technology" thus: "the essence of technology is by no means anything technological" (1977:4). He devoted his attention to an assessment of the essence of technology so as to understand the true meaning of his contemporary condition. He termed the dominant metaphysical framework of modern technology Gestell, which is commonly held to mean "entrapment." Gestell reduces the world to a resource waiting to be unlocked in service of a technical system. Heidegger would then develop the concept of Galessenheit, calling for releasement from a willful/enframing imposition of technology.

Gestell: enframing or complexity

In his quest to determine the essence of technology, Heidegger starts with a deep questioning of the modernist forms of thought, insisting on the question of being and the true essence of things. In this exploration and questioning, he deals specifically with technology, but more significantly the frameworks in which technologies come into being, circulation, and usage. He uses the concept of "Gestell" to mean a form of "gathering"[51] of all entities of the world and their subsequent ordering (Merwin et al., 2019). These entities do not participate in such ordered relations on their own terms, but are predisposed to appear in a certain way. It can be thought of as the ideology within which machines find themselves positioned. Gestell predetermines "what

[51] This reminds Bruno Latour's notion of nonhuman agency as a gathering (Sayes, 2014)

they are and what position they should occupy within a specific technological framework" (ibid:6). Gestell is about not technology as such, but the conditions under which technology emerges—and that it emerges in a way that reinforces, or imposes, an ordering of the world in an instrumental manner: "Enframing means that way of revealing which holds sway in the essence of modern technology and which is itself nothing technological" (Heidegger, 1977:20). The overpowering force of technology comes from its expansive and destructive emergence in the modern era: "'The enframing' is Heidegger's name for the dominant understanding of the world of his time, reducing the meaningfulness of the world to a technological system of exchange, where all objects and even people are conceived as replaceable elements in a complex structure eschewing individual or collective responsibility" (Keiling, 2018:96). Heidegger questions how humans ended up here and how technology was historically transformed: because it was considered in relation to the attainment of truth by ancient Greeks, although under modernity this meaning is lost to Gestell. There occurred a change in history which would both highlight how Gestell emerges and, further, prepare the grounds for a free relationship.

Gestell is characterized by calculative thinking, which aims at a cybernetic rationalization. This kind of thinking (in contrast to meditative or contemplative thinking [Keiling, 2019]) replaces things with their utility; function becomes the form, and things are represented as variables or in numeric fashion:

> "'Cybernetic rationalization' amounts to the establishment of a system that guides itself without deliberative intervention. It requires a kind of thinking that succeeds in uncovering the precise, replicable, calculable unfolding of causal interactions and in arranging a system so that those interactions can be predicted and governed" (Wrathall, 2019:23).

Heidegger finds a functionalist picture of the world in his quest to understand the essence of technology in modern times, because the kind of thinking that is enabled in modernity is one of instrumentality, where even the thought itself is a means to an end: “Calculative thinking discloses everything as a resource to be ordered and used for the production of power” (Zimmerman, 2018:209). This idea represents the world in functional integration, with everything interlocked in a scheme of functional interdependence. The things themselves, including machines, have no relevance unless they can be defined in functional relation to other parts, which overall constitute a sui generis entity (be it society, market, factory, or family). Roles determine positions, and things appear only as facing a subject who determines their function—and nothing more.

Heidegger's aim is to dig deep here: What is the mode of existence under an instrumentalist regime of calculation? His incursion is that calculative thinking has modified all manner of thought and chained existence to a particular mode of revelation. Calculative thought, while presenting itself as revealing, actually conceals the inexhaustible multiplicity that lies in the world. That being said, for Heidegger, modern technology is not an evil, but a historical necessity: “tool use and technology are important parts of human history, and he characterizes Gestell as a destiny that humans are called upon to fulfill” (ibid:214). Technology is humans' fate; but one must also prepare for the overcoming of technology (Wrathall, 2018). The real danger here is when technological order imposes calculative thinking as the only legitimate way of thinking: “The approaching tide of technological revolution in the atomic age could so captivate, bewitch, dazzle, and beguile man that calculative thinking may someday come to be accepted and practiced as the only way of thinking” (Heidegger, 1966:56). Amid the imposition of technology, or rather the intoxication of power that calculative thinking affords, other forms of thought and different reflective practices face the danger of extinction.

Thus, this is what is at stake in this conversation for Heidegger:

> "is there a kind of thinking that can help us not just to understand, assess, and ultimately resist (if necessary) the technologization of the world, but that would in addition help us realize our highest dignity as beings with the capacity for thought?" (Wrathall, 2018:24).

The intoxication of power shrouds the essence of things, and so the task of thinking, in resisting the technological order, should be to uncover that essence. I do not go into the philosophical details of Heidegger's analysis of the essence of technology; it suffices to say that he reaches his argument by way of interrogating the three senses of essence: the whatness of a thing; its enablement, or condition of possibility; and the ground of that enablement (Heidegger, 1977). In his analysis, truth appears as a form of correctness, a correspondence between thing and mind; and indeed, the order of this correspondence in modernity comes to be represented as a world order. Truth, then, is not at all about the truth of things or the essence of things, but a relation of appropriateness, of adequacy, between an object and a knower. This form of truth as adequatio takes its form in the complex relationality among an assertion, an orientation or way of relating, and an object. How does one determine that an assertion is true? Heidegger emphasizes that a statement or assertion owes its truth to the way of relating so long as the subject and object come together in an Open (Keiling, 2018). It is in this quality of the "Open"[52] where a legitimate sense of truth can be captured—and it is here that I turn to Heidegger's formulation of Gelassenheit.

[52] Donna Haraway (2008) also engages with the concept of the Open in her book "When Species Meet": "The needed morality, in my view, is culturing a radical ability to remember and feel what is going on and performing the epistemological, emotional, and technical work to respond practically in the face of the permanent complexity not resolved by taxonomic hierarchies and with no humanist philosophical or religious guarantees . . . the open is not comfortable" (Haraway, 2008:75).

Gelassenheit: releasement or simplicity

I left the above discussion at the question of what determines an assertion's truth, or correctness, and a rather abstract notion of an Open: “The behaving's [knower's] character of standing in the open as the internal enablement of correctness is grounded in freedom. The essence of truth, understood as the correctness of the assertion, is freedom” (Heidegger, 1992). Further, “Freedom now reveals itself as letting beings be” (Heidegger, [1943] 1961). From the essence of truth, Heidegger formed a conclusion about freedom that there is a relationship between an actor and an object; and the truth reveals itself whence this relationship occurs in openness. This openness that enables a legitimate truth is what freedom is; further, freedom is an ongoing orientation in the subject of “letting things be.” This is where the term Gelassenheit enters Heidegger's analysis of the essence of technology: It is a form of correction to the obfuscating character of Gestell, which conceals the world by bringing forward calculative thinking as the true form of technology. Gelassenheit is a form of life that is intellectually autonomous or, rather, does not depend on technology. As a counter-term to Gestell, Gelassenheit comprises simplicity as opposed to the hypercomplexity brought about by the cybernetic rationality.

Heidegger conceptualizes Gelassenheit as a releasement, a letting go, from the supreme danger posed by the relationalities enframed under modern technology (Keiling, 2019). It is a mode of existence that attunes or orients the subject to the true essence of other beings. Meaning, or more correctly the capacity to attribute meaning, relies on this comportment called Gelassenheit, which refers to a kind of non-willingness, but also a willingness to let things be. It is an intellectual pathway to a free relationship in that it releases the being from its will to dominate. This idea refers to Nietzsche's discussion on the will to power and the will to represent, calculate, or enframe beings. Since the nature of the will to power is to overstep and maintain (as mentioned earlier in

the explanation of Gestell), the force of technology manifests as the power of the will to power. Thus, if one is to transform the relationship, one must release oneself from the will. Released from the will, the subject now has the possibility of encountering beings on their own terms, not simply through their functionality or through the subject's own habituations. This releasement allows the emergence of a free relationship.

Gelassenheit, as an antidote to Gestell, has a transformative quality. It goes against the dominant form of thought (and relation) conceived in the technological order. It defies the legitimacy of Gestell, which positions the subject in relations of domination, by introducing an element of ambiguity—a double existence. Gelassenheit is not a willful activity; thus, it does not possess agency in the commonsensical understanding of the term. It is neither an active state of doing things—going down the path, so to speak—nor a passive state of inertia. It is rather "an active disposition of self-restraint" (Keiling, 2019), that is, withholding the judgment that so easily follows an encounter in the modern flow of everyday life. The enframing is ready, given in relationality with technology itself, and masks the beingness of beings. Gelassenheit, contrarily, refers to that comportment which withholds that judgment or utilization in order to allow such entities to present themselves to the relationship on their own terms. In the attitude of Gelassenheit lies a releasement to others. As the knower or subject releases itself from its will, it comes to be released onto others; entities do not then appear as simple objects, but they are encountered in their own self-belonging. Entities are not objects that could encounter a subject as determinate beings, but are rather left alone as things that are nothing absolute; they are not determined, and thus an openness seeps into the relationship instead of an instrumentality that enframes the encounter.

The letting [Lassen] occurs in three respects. First, it appears as enabling, which implies the genuine sense of letting (Haugeland, 2013)—the intellectual aspect of behaving, which enables

things to manifest themselves in a genuine way. There is a genuineness, as thinking does not presuppose or attribute a unified account of the entities it relates with. Artificial Intelligence can actually be a very fruitful array of technologies to prompt Gelassenheit, as there is already no unified account of what AI is. It is at once text, desire, function, engine of capitalism, homo machinus, etc. This undecidability and uncertainty of AI makes it a good context for an exercise of letting. Back to Heidegger's formulation, letting brings an authentic form to relation and comprises the genuine source of meaning, especially since the meaning of action can be found not in the result of the action, but in the enabling nature of the action: Meaning emerges as the realm of possibility, as what the action comes to enable in the world.

The second aspect of letting is its referential character (Haugeland, 2013), illustrated as the "horizon of thinking"—an understanding or an idea that guides the action. This can be thought of as the designer's idea of what they design in a process, and hence the idea that guides their process of thinking about the project. The referentiality again comes from the double character of Gelassehneit: "By positioning a horizon between thought and its objects, thinking not only determines how something might possibly be understood within this horizon, it also delimits what might be thus understood" (Keiling, 2018:101). Thus, a horizon, or this kind of representation, enables thinking and also simultaneously delimits it. This happens through the operation of techne, which creates a context in which things can gain meaning, but also restricts that zone by imposing on the understanding.

Following Tobias Keiling's analysis, "in the terminology of letting, one could say that téchne is revealed as a letting-be-technological, but not as a truly enabling, unconditional letting of entities" (2018:102). Of course, this kind of restriction or horizon is necessary for understanding to arise, as the act of understanding requires a context in which an entity exists or is to be located.

One moves through this horizon in the third character of "letting," which refers to its being ontologically noncommittal (Haugeland, 2013). While the context is given for understanding, the horizon of ontology is not presupposed when releasement conditions the orientation. Gelassenheit does not impose any final horizon or universal end, for such imposition would conceal the genuine meaning of entities. There is no ontological claim to be made by thinking, no imposing orientation toward a Being.

Rather, Heidegger brings releasement to the region of the Open: letting oneself into the open region of thinking and allowing the object of its thought to abide by a certain openness and not commit to an ontological horizon. This openness brings an unmediated experience: "Thinking qua releasement accomplishes not the imposition of a universal horizon but allows for the unmediated experience of such openness" (Keiling, 2018:108). Gelassenheit does not impose, but also does not grant access to something that is above and beyond. A thing shows itself in its own horizontality and not in the subject's imposition. Things find their own meaning not in the thought, but in the experience. This is the crux of the idea that this project addresses: Things have their own determinations that cannot be sublimated by an understanding or thinking subject. The meaning of a thing makes itself known through experience. In fact, I would push this idea further to say that this is not necessarily a relation of knowing, but a relation of feeling, of affect. Things reveal themselves when one approaches them without the mediation of "logos."

Thus there is a certain weight on the phenomenological character of Gelassenheit as opposed to the epistemological and ontological presuppositions of technological order. Heidegger would find that Being and the activity of letting are simply the same. The genuine source of meaning (Knowles, 2013) lies in the capacity or ability to experience the world without rushing to a unification or looking for a delimitation: These will come to relationality in the process of

“letting,” but what is important is that the subject does not impose such horizons onto the objects themselves. The subject always thinks, even when it is in the process of letting, and even though this is the case, it can also withhold the unifying aspects of its thinking. This is where one finds Heidegger's radical turn in his analysis of technology. He approached phenomenology, rather than ontology, to find meaning. He related to being-in-the-world in an unmediated manner instead of being thrown into it. This relation is enabled by the double aspect of Gelassenheit: an active passivity or the passive activity of allowing things to be for themselves (Merwin et al., 2018). Heidegger would claim that this is the task of a thinker in the age of technology: to cultivate an orientation that moves beyond the given thought, to achieve an experience that defies the rigidity of representation, and insist on making meaning through experience:

> “Releasement toward things and openness to the mystery belong together. They grant us the possibility of dwelling in the world in a totally different way. They promise us a new ground and foundation upon which we can stand and endure in the world of technology without being imperiled by it.” (Heidegger, 1966:55)

This attitude is what can inspire the mission of a sociology of machines: not accepting the fate of technology and denying calculative thinking’s will to dominate us. While Heidegger's notion of freedom here is freedom from the will and keeping ourselves free of technology, a sociology of machines must look at freedom with technology while still withholding the will. Perhaps freedom can only arise from humans' embracement of machines and their mutual emancipation from instrumental reason.

Meeting the Challenge of Technology via Phenomenology

Ultimately Heidegger’s question is, what is the task of thinking in the age of technological order? I address this challenge so as to delineate the phenomenological strand in Heidegger's idea

of the essence of technology, "A phenomenological strand which offers important insight into what thinking is responsible for now" (Crowell, 2018). Heidegger's understanding of phenomenology is not easily discerned, but one can turn to Edmund Husserl to get a grasp of his notion.

Husserl considers to a great extent that intuition is the basis of "genuine" knowledge. In his "Principle of All Principles," he expands his conviction that a sound argument requires an intuitive grasp at its core: The experience of things forms the judgment of things, and thus, where such intuition or experience of things is not found, one should suspend judgment (Hadjioannou, 2018). This view establishes experience as the ground of knowledge, and intuition as an entryway into investigating the givenness of things (and not simply the properties of things). For Husserl, this investigation then takes the form of inquiring into intentionality, where things (including the self) present themselves to experience as something (Crowell, 2018:75). The philosophical task here is to discern the transcendental correlation given in the investigation of entities. In this regard, philosophy and science are separated in that science looks into the properties of things and entities, whereas philosophy looks into the normative ordering of such things inherent in the field of science itself. Again, the phenomenological attitude involves examining the invisible, unapparent conditions underlying the meanings of things in the world and, perhaps in line with sociological imagination, requires the phenomenologist to assume a position of estrangement from the natural, everyday appearance of things so as to be able to grasp the conditions through which the phenomena (appearances) emerge.

Heidegger would also later proclaim that phenomenology attends to "something that proximally and for the most part does not show itself at all" (Heidegger, 2003:59, as cited in Suddick et al. 2020) and, consequently, forms the ground that constitutes meaning. Here, however, one must not confuse phenomenology with metaphysics. Metaphysics pays attention to clarity of

concept, the isness of being, and the essence and existence of being. Phenomenological discourse is concerned with the "Being of entities, its meaning" (Heidegger, as cited by Crowell, 2019:75). Meaning is not an entity or apparition in experience, but has to do with the framework of understanding. In this sense, Heidegger cultivated Dasein as an "understanding of being" (ibid:76) and so in relation to a thinking subject. Here, phenomenology can be tasked with making sense of something that is not yet apparent—some meaning that does not belong to a final horizon.

Finding meaning in the worlding of the world

Heidegger would respond to modern technology first with a philosophical investigation into the essence of technology, but would quickly save the thought by inquiring into the parameters of what a free relation to technology could be like. Phenomenology can facilitate this free relation through the conception of an "other" beginning. This is where Gelassenheit makes its mark as an attitude, an intellectual orientation that "waits" for something without "anticipating" any particular feature (Crowell, 2019:77). Heidegger is able to grasp the dangers of modern technology by attending to the normative order in which technological relations are conceived, and it is only through this path that he insists on a free relationship. It is an antidote to the calculative reasoning contrived in the order of technology. Heidegger reaches this point by showing how the dominant way of being in the world is as "standing reserve," ready to be used in a certain way, preconceived and pregiven in the framework of entrapment. Here, one needs a phenomenological account of how such an experience-as-something surfaced—how things emerged as standing reserves in a way that enabled scientific thinking, which came to be the normative structure in which such an experience became possible.

Hence I refer to the hammer, once again. As discussed earlier, the hammer appears as a hammer only in the use of itself and its various properties in accomplishing a task in building

something. The task itself, moreover, emerges only within a certain context. Thus, to the observing eye, there is a need to include not only the instrumentality of an entity, but also the ground on which the ability to build is located. This ground is not the motivation, intentionality, or some kind of causality underlying the meaning of the thing, nor does it comprise properties as founded in a scientific endeavor. The ground of meaning is set in the relationship between the thinking subject and the thing that appears to the subject. The being of a thing is determined by its normative dimension or orientation toward the world. Things emerge in the world when Beings act for the sake of accomplishing some kind of meaning. For instance, the world of education exists with many entities included in itself: students, teachers, lectures, systems, documentation, books, boards, etc. However, all these entities gain meaning once the student studies, the teacher teaches, the lectures are given, the systems are applied, and so on. Heidegger would take this one step further, though, in that he would aim to grasp the meaning that transcendentally permeates all such worlds in a certain time (thus, the Being and Time). Here, Heidegger foregrounds thinking as that pervasive ability to grasp the world and does not give up on the task of thinking in his attempt to overcome representational thinking and his turn to phenomenology: "The worlding of the world requires the thinking being" (Crowell, 2019:89).

From representation to experience

One should not jump to the conclusion that people can think of different meanings and, as a result, experience a different world. While humans have inherited the normative orientation of the ground of meaning, at the same time, this ground carries with itself an opening. It "is never a fate that compels" (Heidegger, 1977:25), but brings an opening, a space of free play [Spielraum]. Thus, while things today emerge in the experience as standing reserve because of their enframing triggered by technology, this enframing also challenges thinking for a response. Here, thinking is

tasked with permeating a whole realm of the world, “continually approaching the brink of the possibility of pursuing and pushing forward nothing but what is revealed” and “deriving all [our] standards on this basis” (ibid:26). The problematic here is that calculative thinking conceals the danger underlying the contemporary condition: It is indeed an enframing of the essence of technology, a contrivance. Heidegger's claim here is that enframing obscures itself as a revealing of simply the way things are. This is indeed resonant: The canonical argument of the technologists is that technology is neutral and machines are simply what they are: calculative engines. However, that exactly is the “supreme” danger in Heidegger's formulation: “[Enframing] effaces meaning altogether by eliminating the normative from the true in its substitution of calculation for an orientation toward what is best” (Crowell, 2019:84). The attention here is on this elimination of the normative from the calculative substance in which technologies present themselves to experience.

Let me take a small step back to better grasp the phenomenological line that underlies the conception of a different starting point. As discussed earlier, meaning is concealed by calculative thinking; and this calculative thinking modifies the essence of a human being. In fact, calculative thinking is a particular modification, a specific possibility, of a human being's essence. Calculation here refers to representation, and thereof, representation voids the milieu of thought. This is a phenomenon particular to modernity which culminates in the systemic effort of representing and thus grasping the world as a picture (Heidegger, 1938). Thinking as such cannot grasp things for themselves if it is left to consider them at a distance; rather, one needs to experience things in relation to the Open, in the “worlding of the world,” so as to be able to think things “for themselves.”

Heidegger's ideas remind us that representation is not the only kind of relation in which humans can know the world; and so a releasement from this thinking, Gelassenheit, would be the way to address the world without necessitating the world to be addressed in any kind of frame. Again, Husserl's account is relevant here: The manner in which the subject orients to the object is an inexhaustible landscape of infinite modality, and further, the subject is not to be considered only in its relation to things that appear to itself. Rather, the horizon of experience is "a topography of proximity and distance, presence and absence; it is not merely what faces us, but what surrounds us, 'outside' our field of vision" (Crowell, 2019:88). Here, everyday sociology finds its relevance, as it aims to reveal the invisible and considers how things constitute subjective spaces in their relationality.

In disturbing representational thinking or experience, Heidegger suggests one must take a different path, a different manner of existence whereby one does not anticipate an outcome, but waits without expectation—for expectation brings with itself the representation of a future state or anticipation. What will show itself if one takes a different path? This is the simple question with which one must tackle the complexity of Gestell. It is precisely here that I situate certain artistic projects' prevalence and their potential contribution to technology in general: a thinking that is praxis; a thinking that is not willing, not aimed at getting to something, but waits for what shows itself along the path. This kind of opening, or rather, the inclusion of the Open in the concerned dealings of a thinking subject, is where the phenomenological path to a free relationship lies. There, one finds the meaning to always be at stake in every step along the path: "Where representational thinking reduces meaning to utility and ultimately to nihilism, meaning, the 'worlding' of the world, belongs only in the experience of being addressed by a direction-giving claim and responding to it thoughtfully" (Crowell, 2019:91). This response, along with the thoughtful

response, is where I locate my approach to research creation. The thoughtful response is a trying, not an accomplishing, and thus an entry into meaning—an undertaking of it alongside the path, not as a result of the path. There is a sense of direction in the path, or rather, a sense of a direction, but not a rule for how to walk along the path or reach a definitive (representable) end.

A Sociology of Machines That Lives

Drawing from Heidegger's thought on technology, one can find the blueprint of a living sociology, which lies at the heart of my methodology for a sociology of machines. In withholding the will and still going down the path, one is to find a different kind of relationship that is free from the imposition of the technological order. This is not an anti-technological attitude; on the contrary, it presents a possibility to conceive of technology outside the normative character within which humans experience machines today. This is a proposition to focus on useless machines, or machines that do not fit into regimes of ownership and authorship, and meet such machines in everyday experience. I pursue a sociological thinking that can grasp these experiences from a different perspective than what is given under the dominance of calculative reasoning. In fact, I propose a sociology of machines that is concerned with the experience of machines and which takes force from creative practices so as to establish alternative relations and different pathways. On this path, there is an opportunity for sociology to seriously consider its position in the world. In a way, I am circling back to Mills's statement presented at the beginning of this chapter: “the intellectual promise of social science is that freedom and reason will remain cherished values” (Mills, 1956:173). In the search for a free relationship, a sociology of machines restores a capacity to imagine, as it aspires to a form of thinking that arises from an “openness to the mystery” (Heidegger, 1966:55).

Heidegger's discussion indicates that modern science, or calculative thinking, has occluded the possibility of encountering life in its real conditions. This is a peril that haunts the social sciences as well. His turn to Gelassenheit is a way to counterbalance this appearance of the world as ready to hand, separate from life, and to be used as a resource for human conduct. Heidegger's discussion shows that observing life within the conditions of a laboratory, confined within the bounds of some mechanisms of abstraction, revealed to observation within some samples, tests, and prefigured variables, goes against the very life that is to be observed. In a way, a sociology of machines is trying to establish itself here. Rather than reduce the relationship between human and machine to one of understanding, I seek something that is livelier—something that goes beyond hermeneutics, something that builds on affects, perhaps in relation to joy, pleasure, and aesthetics. Of course, these affects are what, in the first place, allow the emergence of understanding. Yet, "understanding the machine" is not necessarily my concern here; I am interested in building relations with machines, to build relations that cannot be reduced to laboratory conditions.

There have been other, better attempts at understanding machines. A sociology of machines would work from affect and not be preoccupied with the perspective about machines so as to form an opinion about it. Here I am borrowing from the social theorist Ulus Baker's discussion on sociology of affects and his insistence on the problematization of sociology becoming an opinion of opinions:

> "sociology is epistemologically—or logically—tending rather to become a general opinion about opinions; of what people are supposed to think about themselves and others. […] And, through this, in social sciences, we have lost the ability to create (what we may call) the life of affects—an affective life" (Baker, 2001).

It is true that the social sciences have lost the mission and ability to create a life of affects. Discussions around AI and ML constantly move in the direction of a "vanishing point of communication" (Baudrillard, 1994). Nevertheless, under the banner of a sociology of machines, I am trying to bring sociological knowledge to cultivate an affective life that involves other-than-humans.

I emphasize this perspective issue because the thesis deals with the concept of agency. Agency implies a perspective, but I have tried here not to reduce it to a notion of a perspective that can then lead to the formation of an opinion. Rather, I have approached the discussion through different affects and interactivities involving humans and machines, so as to recast a different notion of agency. Instead of understanding perspective as a communication problem, a sociology of machines aims to look at its agency as a plural and heterogeneous set of affects. This is how one can reach a conception of agency as a collective endeavor (Chapter 3). There are myriad relations that remain outside the bounds of intelligibility and calculative understanding which can reintroduce liveliness to that relationality. A deep relation to life, affects, and emotions seems to prove and provide lifelines, which is what a sociology of machines can establish. Amid the intoxicating power of calculative thinking and the need to carve a space for a sobering attitude of letting things be, I am compelled to think of adventure as epistemology. This is an adventure not into the exotic places of the Western gaze, but into the Western world as an exotic place itself. This endeavor is not to uncover or attribute fetishes of a distant culture, but to reveal and cultivate fetishes amid a world of machines.

While this move aims to explain social action, it does not reduce it to intention or motivation, or to a desire or will that flows out of a self-evident totality. Instead, the aim here is to deal with social reality as a product of the kinds of relationalities themselves. Knowing that control

and domination relations do not encompass all the relations incited me to carve out spaces in which one can think and talk about other kinds of relations. This space I found more in creative and playful engagements with AI machines. Neither play nor creativity is new to AI paradigm. However, the manner in which play is taken in this field has been mainly through behavioral sciences, more particularly the Game Theory (Nash, 1951). AI culture at large tried to understand play through calculative reasoning, conceptualizing it as an instrumental move that stems from a calculation of relations between rewards. Contrarily, I see play as a field of possibility for shaping reality. In this sense, playful spaces and playful relations carry a significance in transforming common-sense reality, because they bring along a liminality. Anthropologist Victor Turner, in his articulation of the potential of liminal spaces for transforming social conduct, refers to play as such: “Liminality is full of potency and potentiality. It may also be full of experiment and play. There may be a play of ideas, a play of words, a play of symbols, a play of metaphors. In it, play's the thing” (Turner, 1979:406). Therefore, play is conducive to not only criticizing already existing categories, but also in creating alternatives. Seeking out a notion of agency from this point of view brings us to the borders of Galessenheit.

This playful exploration is considered to be key in this proposal for a sociology of machines that aims to grapple with humans' complexly textured relations with machines. If ritualistic habituations provide a sense of normalcy and reality, and indeed constitute the core of sociality, then one can also conceive of play and playful engagement as the prerequisites for the emergence of any kind of deviance that can purport some subversion to the established frameworks of conduct (rituals/rules of interaction). Play includes the imaginary; it implies an engagement with an imaginary that is in abstract, symbolic relation to materiality. Play also connotes deception and deviance, a curious exploration that dabbles with or exists within the rules of a structure. This

attitude can be considered an alternative to the cybernetic rationality that Heidegger criticized, and indeed, in search of an antidote, a sociology of machines turns to play as a methodology with which to account for a social life involving machines.

In its commitment to restore the capacity to create an affective life to social sciences, sociology of machines attributes a special significance to imagining new experiences with machines. On this path, one can consider the role ethnography would play in the process of designing technologies. This brings the discussion back to Heidegger's point about the phenomenological starting point for a free relationship with technology. Indeed, my sociology of machines can be considered a call for fellow sociologists to engage with the machine as an ethnographic endeavor, documenting and reflecting, all the while creatively engaging with these technologies. This would allow the discipline to move away from the neutrality of technology or a critique of calculative thinking, both of which conceptualize machines as tools, ultimately. When stuck in this tool-like conception of technologies, one is bound to always respond in ways that expand and contribute to the logic of Gestell. Expanding the space of interaction so as to be able to conceive of different ways in which machines find agency is a way to resist the dominance of the technological order. It is important to employ methodologies that resist our common assumptions and go against common sense so as to reveal the domains that the discipline in its traditional mode cannot tackle. Sociologists should carve spaces for experimentation and play so as to transform the discipline according to the challenges posed to it.

The creative potential that rests in a “machinic encounter” is what allows an escape from the grip of calculative thinking. In the approach to the event of an encounter, and in the cases that fall under this category, there are no plans, premeditation, or control over the outcome; no means are directed to no ends. Rather, our projects sought those relations that explicitly play with the

givenness of reality and the taken-for-granted flow of everyday life. Especially in the context of the emergence of large language models (LLMs), the very institutions of higher learning, universities and publishers alike, grapple with this new reality—and scholars are already setting priorities for research moving forward with these technologies (Van Dis et al, 2023). Thus, I would add to these lists: Play and experiment! Do not just employ these machines in their tool-like capacity for work, but see how they can move toward different experiences. This attitude will attune researchers to the deeper synchronicities within their relationalities and allow them to reveal different potentials that could only be explored in such playful intimacy.

Epilogue: This is not a fictional theory—A Note on Baudrillard

"Were it possible to make the poetic[53] a basis for radical politics?"

Tobias Rees, 2021

Going down the Country Path to meet the machines in the Open, I would like to close by visiting one more idea so as to insist on the relevance of social theory in the age of machine learning. Jean Baudrillard's ideas about the digitalization of reality and the dominance of consumer capitalism provide a deep criticism of the technological order, all the while asserting that the contemporary moment makes social theory effectively redundant. Baudrillard was famously pessimistic in his treatment of the (social) world. Nonetheless, his ideas had been the closest sociology had gotten in grappling with the experience of contemporary technological reality. For this reason, I find it significant to make some space for his thoughts here. In this visit to Baudrillard, I will reassert my investment in carving out a space in which to pursue exactly what he denied, as I insist on the necessity of social theory in the face of an enframing technology. I formulated this section as an epilogue and not a conclusion, as I want to signal that the work of reimagining human-machine relations is ahead of us, and that the project of sociology of machines is not finalized, but simply brings an opening.

Baudrillard's "System of Objects," building on his earlier work on symbolic value, takes as its subject matter the increasing proliferation of objects in contemporary capitalism. He starts his analysis, covering a wide range of designed objects and art objects, as well as everyday objects, with this statement: "The technological plane is an abstraction: in ordinary life we are practically unconscious of the technological reality of objects. Yet this abstraction is profoundly real: it is

[53] Rees refers to uses of machine learning in undermining human exceptionalism as poetic.

what governs all radical transformations of our environment" (Baudrillard, 1996:5). Here, Baudrillard points to the sense-making activities surrounding the objects in consumer capitalism while making ample space for discussing the logic or rationality of the technical objects themselves. Primarily concerned with "reality," Baudrillard grasps that the path to conceiving contemporary reality passes through and is mediated by technology. He insisted time and time again that the models indeed are the real, the map preceding the territory, and the hyperreal, making one forget that the real has already disappeared (Baudrillard, 1994).

Meditating on the transformations of the social world via the infestations of the technological, or rather the unconscious dimension of the technological, Baudrillard paints a dramatically pessimistic picture. In his "Fatal Strategies," he builds on a vision of the social world from the point of view of an object, effectively proclaiming the end of the Kantian subject and, thus, the disappearance of the ground of meaning from the human. However, the sense making position has shifted to the objects, a system of objects, and, in fact, to a hyperreal object. Baudrillard's strategy against this system of objects is a fatal strategy: maintaining a silence, accepting the inversion of object and subject, and taking this logic to its extreme. He makes this point again through an argument about how the media generates a world of simulations beyond the reach of meaningful critique or rational response. A whole system of communication actually threatens meaningful exchange in the social realm: "Are we really communicating, or isn't it rather the problem of our whole society expanding, transcending, and exhausting itself in the fiction of communication?" (Baudrillard, [1992] 2008:1). In fact, Baudrillard treats every social fact based on its disappearance from the social: "does the fantastic success of artificial intelligence arise from the fact that it makes us free from real intelligence?" (ibid:7). The same argument follows for communication technologies: He laments the vanishing point of communication and asserts that

the increasing social complexities constituted by functions of transparency and fluidity generate a "collective suffocation." This era, for Baudrillard, represents an end point where the system of objects dominates all meaning and flow in the social world. Where communication starts, speech ends; and thus, communicative operations start to preclude social action.

In the social structure of electric solidarity, Baudrillard states, all forms of transparency are enforced onto the social landscape, thus risking the disappearance of the "Otherness": The irreducibility of the subject and object is lost at the vanishing point of communication. In fact, this interplay between the human as a transparent other and an opaque digital subject or object forms the central tension of contemporary social life. Baudrillard makes space for this understanding: "Otherness is virtually squatted by the machine…. Why speak to each other when it is so easy to communicate?" (ibid:20). He then laments the transformation of the whole paradigm of sensibility: The image replaces the eye, automated calculations displace the sense-maker, and so on. What is at stake for Baudrillard is the human, and the human's alienation from the world. He states that communicative operations introduce an undecideability between the human and the machine:

> "Am I a man, am I a machine? There is no answer any more to this anthropological question. In a way, this is the end of anthropology, the science of man being itself confiscated by the most recent technologies. Paradoxically, this anthropological uncertainty goes along with the growing perfectibility of networks, just as sexual uncertainty (am I a man, am I a woman, what about sexual difference?) arises from sophisticated techniques of the unconscious and of the body. Sophisticating the undecidable. Just as radical uncertainty about the status of object and subject arises from the sophistication of the microsciences." (Baudrillard, [1992] 2008:22)

While highly pertinent, Baudrillard's fatalistic picture of ever-growing uncertainty in the face of a system of objects leaves little room for a situated understanding of the technological world that is producing our reality. Furthermore, by proclaiming the end of anthropology, he essentially removes social structures from having any kind of determination in or contribution to the production of reality. Indeed, a whole realm of the real becomes to him a desert in the operations of empires: “It is the real, and not the map, whose vestiges persist here and there in the deserts that are no longer those of the Empire but ours. The desert of the real itself” (Baudrillard, 1994:1). The power of truth production had left the real, as the truth was now produced by models constituted in the hyperreal. The disappearance of the difference between the signifier and the signified abolished the real, because its dialectical other also disappeared. When the model predicts the real (e.g., military technology, intelligence technology), and when speculative models generate value (e.g., derivative economies), the territory of the real loses its significance, as do the operations in the social. This, then, just ends the conversation. Indeed, Baudrillard develops the idea of “theory fiction,” or what he also calls “simulation theory” and “anticipatory theory,” as a way to indicate the impossibility of theory (De Boer, 2005). He treats the insistence on the disappearance of theory as a fatal strategy: Let us close all books and go back to our simulations. Perhaps, and hopefully, he was wrong about this prediction, too.

Thirty years after Baudrillard's insistence on the futility of theory, one finds that society is rather persisting through technological systems, perhaps struggling, but rich with affect nonetheless. I return to Michel Foucault's insistence that society must be defended. The sociology of machines proposed here arises from what Foucault termed “subjugated knowledges.” He explains these as “a whole series of knowledges that have been disqualified as nonconceptual knowledges, as insufficiently elaborated knowledges: naive knowledges, hierarchically inferior

knowledges, knowledges that are below the required level of erudition or scientificity" (Foucault, 2004). A sociology of machines, by sheer virtue of its methodological toolbox of playful and creative approaches that struggle to find legitimacy in the structure of social science, is positioned at a critical distance from bodies of hierarchical knowledge:

> "It is a way of playing local, discontinuous, disqualified, or nonlegitimized knowledges off against the unitary theoretical instance that claims to be able to filter them, organize them into a hierarchy, organize them in the name of a true body of knowledge, in the name of the rights of a science that is in the hands of the few." (ibid:9)

Thereof, it resists the pull of intoxicating power that calculative thinking exerts on sociologists; and it exceeds the bounds of the simulacra that Baudrillard thought to be the end of history. Sociology of machines is not to be the purview of an elite, it does not serve the elite, nor does it claim to provide a hierarchical structure to the world of machines. Its significance is in seeking out relations that do not dominate or be subjugated by machines, but those that make kins with machines (Lewis et al., 2018).

The very idea of a sociology of machines defies Baudrillard's disclaimer about the end of theory. It embraces joyfully the possibility of different relations with machines and seeks these out in creative endeavors and playful interactions. Moreover, it insists on the relevance of social theory and assumes the responsibility handed by Heidegger's discussion on Gelassenheit. Meeting the machines in the Open allows a different sort of engagement to appear: The tool stops being a tool, but emerges as a relation that asks, guides, and hangs together, basically; and it is not simply an extension of a corporation, but a companion capable of joy and silliness, just like our imagined others comprising humans. The playful potential is one example of many instances of engaging

with these objects without reducing them to their tool status or to discursive monstrosities; it is ultimately a way to demystify the tools, decorate the relations with machines, and enrich the experiential space that allows the agencies to emerge in a manner that destabilizes and searches for new meanings.

Sociology can explore relations with machines in affective experiences as a way to invest in new relations with technology. Sociology as a discipline has an opportunity here to contribute to the emergence of relations that cannot be dissolved under cybernetic rationality and could take responsibility by engaging with life in its flow, rather than as the sour observer depicted by Simmel's stranger. This approach, I believe, is how sociology can retain its relevance as the discipline moves further into this century. In making new relations, drawing new imaginaries, and imagining itself anew, sociology can transform itself alongside the transformations in the coming world.

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