CHAPTER 9

An Interventional Design Anthropology of Emerging Technologies: Working Through an Interdisciplinary Field

Design

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In this chapter, by reflecting on the example of the autonomous driving (AD) car, we outline the role of the anthropology of emerging technologies as a critical and interventional voice in interdisciplinary scholarship and public debate. Emerging technologies are commonly understood as new, digital, data-driven, intelligent, or automated technological innovations either in development or at the cusp of being launched into a market. However, they might remain emerging technologies for undefined periods. The AD car is an ideal example since, in business media, AD cars were considered the most hyped emerging

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technology in 2015 (Fortune 2015), and in 2020 they are still listed as amongst the '7 biggest technology trends' that must be prepared for (Forbes 2020). While anthropologists of technology and media have consistently studied the socio-technical relationships that come about as new digital technologies become part of everyday life, the anthropology of emerging technologies is distinct in its concern with the experience of technologies in possible futures. Such experiences cannot be explained through the conventional anthropological focus on the present and the past, or researched through traditional ethnographic methods. There is also a significant history of anthropological engagement in technology design in industry. Examples include Lucy Suchman's early work in Silicon Valley (e.g. Suchman 1998), Genevieve Bell's research leadership at Intel (e.g. Dourish and Bell 2011), and, in the AD car field, Melissa Cefkin's research at Nissan (Vinkhuyzen and Cefkin 2016; see also Cefkin 2009). However, we now need a new wave of anthropological intervention in the field of emerging technologies that goes beyond embedding applied anthropologists in the sites where technology is designed in industry, to involve sustained collaboration between academia and industry—that is, 'an interventional anthropology of emerging technologies' (Pink 2021).

In this chapter we present emerging technologies as an anthropological category, demonstrating through the example of AD cars how an anthropological approach differs from, but can usefully engage with, those of cognate disciplines of Science and Technology Studies (STS) (Marres 2018; Stilgoe 2018) and human geography, selected because they have also investigated AD cars (Bissell et al. 2018; Bissell 2018; Ash 2017). Our discussion takes into account two key themes in contemporary interdisciplinary debates about emerging technologies: ethics and trust. Through the example of AD cars, we show how the anthropology of emerging technologies can revise these categories of ethics and trust to contest technological determinist narratives in ways that accompany but extend STS and human geography approaches.

In developing this discussion we draw on our own ethnographic research, which involves using visual, sensory, and design ethnographic techniques to put human experience and imagination at the centre of discussions about the future of emerging technologies. Our work evolves in an interdisciplinary and international space where research, findings, and interventions are not the domain of the lone anthropologist but are shared, bringing together critical scholarship and collaborative practice. In doing so we draw together our existing scholarship and research, spanning projects we have developed since 2016 through collaboration across Sweden and Australia, between our universities, and Volvo Cars.

Design Anthropology and Emerging Technologies

The anthropology of emerging technologies is not necessarily a pure academic anthropology, but, rather, a future-oriented theoretical and engaged practice (Pink and Salazar 2017). It is focused on futures and on engagement outside

academia and, as demonstrated by this chapter, its scholarly contribution tends to be one of scaffolding new ideas onto directly relevant theory and ethnography rather than excavating trajectories of anthropological debates and ideas. Anthropologists have researched many facets of emerging technologies and critically analysed how they are engaged socially and politically. Examples include drone warfare (Gusterson 2016), the ontologies of drones (Fish 2019), how blockchain futures are imagined by finance professionals (Maurer 2016), cryptomining (Calvão 2019), and studies of media technologies situated in digital anthropology (Geismar and Knox 2021). These works make important interventions in fields of political, economic, and media anthropology and provide relevant opportunities to learn within specific fields, but are dispersed rather than constituting a united field of anthropology as such.

Our work is, moreover, not strictly applied anthropology. Following the pioneering work of Lucy Suchman (1998), embedded applied anthropologists have long since worked in technology industries; our particular practice, however, involves working across academia and industry to design and undertake research, publish academically, and mutually produce creative translation materials (Pink et al. 2020). Straddling academic and applied research, we situate our work as a mode of design anthropology, while learning from anthropologies of technology design practices and imaginaries, particularly how futures are articulated within them (Lanzeni 2016; Özden-Schilling 2015).

There are three waves in design anthropology (Pink et al. 2017). Lucy Suchman's ethnomethodological work in human-computer-interaction research (Suchman 1998) led the first wave and was an important step in understanding human interaction with technologies in interdisciplinary contexts ethnographically. It influenced subsequent design anthropological studies of social and interactional elements of AD, discussed below. A second wave in material culture studies (e.g. Clarke 2017) has a greater focus on object design and bears a relation to Daniel Miller and Heather Horst's (2012) material culture approach to digital technologies. A third wave is associated with Tim Ingold's phenomenological anthropology and Danish design anthropology, which acknowledges the sensory, creative, and improvisatory dimensions of design as the practice of both experts and everyday practitioners (Ingold 2013; Gunn et al. 2013; Smith et al. 2016). Rather than understanding relations as interactional or centring materiality, this wave emphasises the entangled, emergent, and processual dimensions of lives, things, and environments (Smith and Otto 2016). Our work aligns with this third wave and engages with the revisionary stance of futures anthropology, its emphasis on contingency and on the unknowability of futures (Pink and Salazar 2017; Irving 2017), and the uncertainty of the present and future (Akama et al. 2018). Therefore, we acknowledge that technologies are inextricable from their relations with humans, but rather than taking an interactional approach that focuses on human-technology relations, we situate humans and technologies as part of ongoingly changing environments. Likewise, while we account for the materiality and object-ness of digital technologies, we understand them as unfinished and as coming into

being and experienced within and in relation to other things and processes, rather than as finished products. With Smith and Otto (2016), our emphasis is on how technologies might be understood as being part of ongoingly emergent worlds, and subsequently how emerging technologies might be seen not as completed products landing in a world already made, but as emerging into a world-in-progress, one with which they will continue to emerge.

Emerging Technologies

The notion of an Interventional Anthropology of Emerging Technologies was coined by Sarah Pink (2021) to denote an anthropological practice that critiques dominant narratives that predict the impact of emerging technologies on futures, through attention to people's sensory, emotional, and practical experiences of imaginaries and materialities of possible future technologies. It responds to business and policy narratives where emerging technologies are understood as not having yet reached or achieved their potential in markets, and where it is expected that, when they do, they will bring benefit to society through disruptive change. Their predicted impact has a sense of urgency to understanding future waves of change across different stakeholder sectors. For instance, in the business consulting community it is stressed that '[i]t is no longer sufficient to embrace innovations and trends that are already underway. To stay ahead, companies must work methodically to sense new possibilities that exist far beyond the digital frontier' (Deloitte 2019). In 2019 AlgorithmWatch, a non-profit research and advocacy organisation, produced its 'Automating Society Report' on automated decision-making (ADM) systems, in which it posed the questions, 'Do we need new laws? Do we need new oversight institutions? Who do we fund to develop answers to the challenges ahead? Where should we invest? How do we enable citizens—patients, employees, consumers—to deal with this?' (AlgorithmWatch 2019)—thus, emphasising the need for preparedness in relation to the launch of emerging technologies.

There are many lists of top emerging technologies, also called breakthrough technologies, revised annually and published in online media by influential organisations such as the MIT Technology Review.[1] Recent examples include social robots, blockchain, drone technologies, and autonomous vehicles, as well as various medical and environmental technologies. Artificial Intelligence (AI) and automated decision-making (ADM) are often features or capabilities invested in (some) emerging technologies. Indeed, there is no circumscribable list of specific technologies defined as emerging; to crystalize in time something that is by nature continually emerging would be contrary to our argument. Instead, emerging technologies are a category of thing involved in relations with humans and other things and processes with which they share possible future environments. Rather than having a clear trajectory within a predictable future, they can be seen as inhabiting what Akama, Pink, and Sumartojo see as the inevitably uncertain sphere of the possible (Akama et al.

2018). This definition contests how emerging technologies are defined in dominant narratives and how their future impact on society is understood. Two examples demonstrate the tendencies of such narratives:

First, *Scientific American*'s online publication, which produces an annual list of emerging technologies, outlined the criteria that its Steering Group used to determine their 'Top 10 Emerging Technologies of 2019':

> Do the suggested technologies have the potential to provide major benefits to societies and economies? Could they alter established ways of doing things? Are they still in early stages of development but attracting a lot of interest from research labs, companies or investors? Are they likely to make significant inroads in the next several years? (*Scientific American* 2019).

Second, the World Economic Forum's (WEF) narrative, published on its website, resonates with that of *Scientific American*, asking, 'Which of today's technologies will shape tomorrow's world?' Answering its own question, it states, 'The emerging technologies must positively disrupt the existing order, be attractive to investors and researchers, and expect to achieve considerable scale within the coming 5 years.' The WEF website primes readers for a report that 'reveals some of the breakthrough innovations that are expected to radically impact the global social and economic order', citing the words of WEF's Chief Technology Officer, Jeremy Jurgens, 'From income inequality to climate change, technology will play a critical role in finding solutions to all the challenges our world faces today … This year's emerging technologies demonstrate the rapid pace of human innovation and offer a glimpse into what a sustainable, inclusive future will look like' (World Economic Forum 2019).

In such narratives emerging technologies have 'not yet' impacted on the world; rather, they are represented as if poised to play a key problem-solving role in securing a better future through major disruptions to the current state of affairs. Thus, emerging technologies appear to be imagined as complete products that will be launched into society when regulation, infrastructure, and other aspects allow. Their ambitions are commendable, since they invite us to imagine sustainable futures shaped by technology. Yet these technologically determinist narratives neglect to address how intelligent and automated technologies may become part of future everyday human worlds.

The merits of taking an alternative approach are already evident. The 2019 AlgorithmWatch report cited above focused on how existing forms of ADM are already being used in society and what we might learn from these regarding prepare for the future. Therefore, demonstrating the point that emerging technologies tend to emerge slowly, often in mundane and inconspicuous ways, rather than making dramatic entrances leading to disruptive social, economic, or other changes. Maurer's (2016) discussion of blockchain accounts for how it was part of the imaginaries of the finance professionals who participated in his research, warning that this might not actually come about. AD cars present another prominent example. Fully AD cars are not currently in circulation in

consumer markets. Instead, we witness gradually increasing modes of automation, represented in a series of automated features available in cars currently on the market. For instance, AD features such as automated braking, assisted cruise control, and automated parking are slowly entering individual lives and public roads. Rather than landing in society in full autonomous mode to subsequently solve societal problems, AD is already present in 'incomplete' or still developing forms (in relation to predicted future impacts) and used by people in response to their personal everyday circumstances. Thus, narratives that define emerging technologies as disruptive and problem-solving miss two key points: technologies may be slowly introduced into society as they evolve, rather than landing as fully formed solutions to problems, and people participate in determining what technologies are used for. As anthropologists know, and as is represented in critiques of such 'solutionism' (Morozov 2013), technologies do not simply impact on people and society or solve challenges.

Emerging Technologies and Problem-Solution Narratives

A more detailed look at AD cars exemplifies how emerging technologies become implicated in problem-solution narratives of innovation agendas and how different academic disciplines approach them critically. It highlights two questions that are being asked about emerging technologies by most academic, industry, and policy stakeholders (although from different perspectives): Will people trust them? And what are their ethical implications? AD cars are particularly pertinent because they were the most hyped emerging technology in 2015. They featured amongst MIT Technology Review's Top 10 Emerging Technologies in 2015, 2016, and 2017, and are reviewed, debated, and discussed across multiple policy, industry, technology design, and public media narratives daily. Optimists hope they will contribute to solving societal problems by increasing road safety by eliminating human error (Winkle 2016), improving quality of life by freeing up driving time for infotainment or work (Kun et al. 2016), and increasing energy efficiency (Davila and Nombela 2012).

Social science and humanities scholars are critical of this technologically determinist agenda for research and design of AD. For STS scholars it neglects how AD will integrate with changing wider socio-technical systems and the new problems that this will give rise to (Stilgoe 2018; Marres 2018). STS scholars define self-driving cars as an experiment, arguing that modes of 'social learning' should be developed around them to inform their governance and policy (Stilgoe 2018), and, furthermore, that experimental methodologies should be used to investigate societal innovation during street trials (Marres 2018). Sociologists and geographers critique technologically determinist positions, arguing for investigations that further situate AD in society and its materiality (Bissell et al. 2018; Bissell 2018; Ash 2017). Previous industry-focused anthropological AD research has concentrated on human-machine

interactions: what people's 'interactions look like with different aspects of the car, its spaces, technologies, and tools, and other people inside or outside the car' (Wasson et al. 2014, p. 3), the interaction involved in driving as a social and technological skill (Vinkhuyzen and Cefkin 2016, p. 524), 'socially acceptable autonomous driving' (Vinkhuyzen and Cefkin 2016, p. 522), and 'social practices of road use' (Vinkhuyzen and Cefkin 2016, p. 523). These studies usefully shift the focus away from the car itself; however, we propose going beyond the social and interactional focus to examine wider environmental and technological ecologies, and the human sensory and affective experiences and anticipatory modes that situate how people engage with existing AD car features and how future AD possibilities are imagined (Pink et al. 2017, 2018a). This agenda can be extended to any emerging technology with which people will potentially engage in their future everyday lives. Analysis guided by the anthropology of emerging technologies de-centres the technology and acknowledges that the experience of it cannot be isolated from the circumstances in which it is encountered or imagined. Recent interdisciplinary debates relating to human trust in AD and the ethics of AD car accident scenarios demonstrate why this is important by revealing how attention to sensory, affective, and anticipatory human engagement with AD cars can shift the debate. These are discussed in the next section.

Accidents, Trust, and Emerging Technologies

As new automated and intelligent technologies come onto the horizon, concerns regarding whether people will trust them have emerged for government and industry stakeholders. AD is a good example, represented as offering the technological possibility of a considerably safer transport system by eliminating human error. However, this is not without its complexities, not least due to the question of the ethics of AD cars, and the capacity they will have for ADM in different accident scenarios. This is often represented in a dystopian and sensationalised narrative in media articles, which ask if future self-driving cars will kill us.[2] Moreover, a 2018 global survey suggests 'almost half of consumers in most markets' doubt the safety of AD,[3] while in 2019 the AAA in the US found that 'Seven in ten (71 percent) U.S. drivers would be afraid to ride in a fully self-driving vehicle'.[4] It is now widely accepted internationally—across governments[5] and industry, and in science and technology media[6]—that generating human trust in future AD cars constitutes a key challenge for both automotive industry and policy stakeholders who hope that these benefits will come about. Thus, significant funds are being invested in technologically driven research agendas seeking to engender trust in and acceptance of AD.

Created in response to academic and public media discussions about the decisions an AD car might take in such accident scenarios, the Moral Machine at MIT Media Lab (http://moralmachine.mit.edu/) presents its users with a series of moral questions regarding whom an AD car might kill in an accident. The MIT experiment is an iteration of the Trolley Problem, which is frequently

discussed with reference to AD cars. The Trolley Problem originates from the example of a trolley driver whose vehicle's brakes fail when going down a valley (see Ash 2017). The driver is faced with the dilemma of either crashing into five workmen who are repairing the track or turning to crash into only one workman. In the case of AD, it is used to describe and debate a situation where the car loses control and will either kill pedestrians of different categories or swerve into a wall to kill the driver, as in the MIT Moral Machine example. The Trolley Problem asks us to confront abstract but affective scenarios that are thought to reveal both human values and their relation to possible future machine decision-making.

The MIT Moral Machine website offers different combinations of persons as drivers and pedestrians who might be saved. It sought to crowd-source information about and discussion of how people respond to such moral dilemmas. The platform collected '40 million decisions in ten languages from millions of people in 233 countries and territories' (Awad et al. 2018, p. 59). Those involved in its design believed that 'Before we allow our cars to make ethical decisions, we need to have a global conversation to express our preferences to the companies that will design moral algorithms, and to the policymakers that will regulate them' (Awad et al. 2018, p. 63). They saw the Moral Machine as initiating this process, reporting,

> Our data helped us to identify three strong preferences that can serve as building blocks for discussions of universal machine ethics, even if they are not ultimately endorsed by policymakers: the preference for sparing human lives, the preference for sparing more lives, and the preference for sparing young lives. (Awad et al. 2018, p. 60)

The authors acknowledge that the scientific limitations of such an experiment are many. However, as with ethnographic practice, ethics are processual, contingent, and situated (Pink 2017). The MIT experiment investigated how rational decision-making, detected at the surface level of what people report, should happen when presented with a moral dilemma on a website. As such it reveals surface values, expressed in such moments, but cannot capture the phenomenological, environmental, and situated meanings involved in how people make decisions within the complexities of everyday worlds. Such experiments can neither engage with the very fundamental anthropological premise that people do not always do what they think or say they do, nor with the principle that our action and experience is inextricable from sensation and affect, not only representational knowledge. Yet such an experiment has enormous popular and media appeal. It is, moreover, aligned to the solutionist narratives outlined above. Awad's Ted Talk (http://moralmachine.mit.edu/) suggests that for AD cars to solve the societal problem of road accident deaths by making road travel safer for the majority, the moral dilemmas associated with road accidents need to be solved in ways that reflect human preferences; this, in turn,

would encourage people to use AD cars and understand the trade-offs associated with their regulation.

As the geographer James Ash points out, the problem with utilitarian approaches to ethics in AD cars is that they focus on design and testing, and do not account for the contingencies of actual accidents. Ash argues for an ethics based on understanding 'the particular situation of the accident, rather than focus[ing] on what the vehicles were programmed or designed to do in advance of these situations' (Ash 2017, p. 158). When applied to AD cars, the Trolley Problem is associated with a societal problem, yet it is detached from realistic understandings of people and society, and derived from a limited disciplinary perspective. Contrastingly, Ash's analysis of two existing reported accidents involving cars with AD features concludes that they were the outcome of how things aligned 'in such a way that failed to disclose important qualities of objects that were necessary for the continuing homeostasis of the driver and vehicle', including 'the contingency of other drivers' (2017, p. 161). Ash insists that for AD cars,

> no matter how many hours of test-driving or simulation data a designer uses to programme a vehicle, the designer can never anticipate the contingency of [the objects they sense] because objects always have the potential to be perturbed in a way not envisaged by their designers and thus can disclose qualities (and in turn spatio-temporal relations) that exceed a smart object's ability to sense them. (Ash 2017, pp. 167–168)

Focusing on the politics of automation, the geographer David Bissell also examines the consequences of an AD accident in the US. Bissell demonstrates how 'the accident subtly reshaped the terrain of the politics of autonomous vehicles through diverse materialities' which occurred at different sites, 'through images; through the words and tenor of eyewitness testimony and newscasters; through the police reports; through the communications between city councils; and through encounters with drivers' (2018, p. 65). This, he suggests, led to a series of transformations across these different sites.

Ash's and Bissell's after-the-event analyses of the AD accident emphasise the contingent circumstances of AD and the wider ecologies within which they participate. They reveal the limitations of the Moral Machine experiment for understanding the relationships that constitute and are effected by accidents. However, there is a further anthropological step needed to comprehend the circumstances in which people might trust AD cars, which accounts for how future mobilities might be experienced within the sensory and affective routines of everyday life, memory, and imagination, and what it means to ask how people might trust AD within those circumstances.

The dominant assumption and hopeful narrative that AD cars will save lives if only people would trust and subsequently accept them is complicated by the work of social scientists and critical Human Computer Interaction (HCI) researchers. Anthropological research has demonstrated that trust is not

necessarily a rational or cognitive sentiment (e.g. Evans-Pritchard 1937; Douglas 1970; Corsin 2011). While quantitative methods, such as survey studies and technological testing, treat trust as measurable, in the social sciences and humanities trust is widely regarded as 'created and reproduced through interactive processes' (Jagd and Fuglsang 2016, p. 3) and thus continuously experienced and modified within everyday life, making it difficult to measure. Survey and technological testing do not interrogate the crucial qualitative questions of how trust actually comes about in the complex configurations of everyday life as it is lived. Critical voices within the HCI community have also proposed more situated approaches to trust by attending to human experience (Norman 2007), observing 'what computers and people do together at large' (Harper 2014, p. 5), and taking 'a user-centred approach that accounts for the modes of trust that all different stakeholders need to engage in' (Sas and Khairuddin 2015, p. 341). Harper proposes a contextual approach to trust as a concept 'in the normal traffic of living' (2014, p. 9), arguing that attention to 'what happens when trust does occur', should replace the existing focus on '*mistrust*' (Harper 2014, p. 10, original italics). Collectively these literatures indicate that we need to account for trust as a qualitative, fluid, and changing experience, and to study the everyday life circumstances in which it emerges.

Trust in Emerging Technologies from an Anthropological Perspective

Within the social sciences and humanities, trust is understood as the action of stepping forward into an uncertain situation, involving some degree of risk (Luhmann 1988; Misztal 2011). Philosophers of trust propose that for trust to occur, a person must have feelings of sufficient confidence based on the degree of familiarity they feel in a given situation (Fredricksen 2016), and social scientists propose that 'trust is created and reproduced through the formation of social interaction processes which are repeated over time' (Jagd and Fuglsang 2016, p. 7). In contrast to an emphasis on trust as a cognitive category in psychological and sociological approaches (Corsin 2011, p. 178), anthropologists emphasise the embodied, sensory, and affective experience of trust, how trust is 'felt' rather than 'thought out', and locally and culturally specific dimensions of trust. Drawing on Rane Willerselv's ethnography with Yukaghir hunters in Siberia, anthropologist Alberto Corsin describes how their hunting entails relationships between humans, animals, and spirits, where modes of showing and deceit create a different economy of trust. He proposes a focus on 'what kind of work the notion [of trust] does', and attention to the materiality and intersubjectivity it may entail (2011, p. 179). The implication for trust in emerging technologies is that we should investigate what other 'things', relationships, and processes are involved in generating sufficient familiarity and confidence for people to trust using technologies within specific circumstances, rather than simply focusing on human-machine relations.

Anthropological research further suggests that trust emerges within contexts of repeated activity. Since the 1930s, it has been understood that people cope with ontological uncertainty through beliefs in witchcraft and oracle consolidated in repeated ritual processes (Evans-Pritchard 1937; Douglas 1970). Research into digital data anxieties suggests that through repeated everyday routine activities, feelings of trust emerge: people trusted that their digital data would not be lost—even when they saved it using technologies that cannot guarantee its safety—because they followed familiar personal saving routines (Pink et al. 2018b). Therefore the 'things' involved in generating trust go beyond other people and objects to include processes such as routines or rituals.

A design anthropological approach to trust in technology (Pink et al. 2018b) has engaged concepts of improvisation and contingency to situate trust within how people improvise to 'find ways of keeping on going' (Gunn and Clausen 2013, p. 174) in the continually changing (emergent) circumstances of everyday life. The idea that humans *improvise with* technologies—rather than technologies *impacting on* humans—is articulated through Ingold and Hallam's argument that improvisation is 'a necessary condition because there is no existing template that instructs us in how to deal with the continually changing contingencies of life' (Ingold and Hallam 2007, p. 2). Ingold and Hallam see improvisation as being 'inseparable from our performative engagements with the materials that surround us' (Ingold and Hallam 2007, p. 3). This is useful for understanding how people encounter new technologies in everyday life, since, following the design anthropological principle, everyday life circumstances are continually emergent (Smith and Otto 2016). Then, 'attending to how people improvise to fill in the gaps between what they think they know and the inevitable uncertainties that actions entail' (Pink et al. 2018b) offers a prism through which to consider those moments where trust is performed, felt, and experienced, but not necessarily visibly or verbally articulated, and as such not observable. Therefore, the implication is that if trust is constituted beyond our interactions with singular entities and always in contingent circumstances, then trust is neither rational nor a fixed state or relationship, but a sense of familiarity in changing environments which can change in accordance with our immediate circumstances. We demonstrate these points through examples from our research into the experience of driving and AD technologies.

Ethnographies of Emerging Technologies in Practice

To investigate the experience of driving and how trust came about within a team-based, industry-partnered project undertaken in Sweden, we developed interventional visual and sensory ethnography methods. Different from traditional long-term anthropological fieldwork, these methods are designed to create intensive encounters with research participants in which we collaborated with them to provide ways of surfacing and knowing their experiences of driving and of autonomous features (Pink et al. 2017). This involved sharing meals,

conversations, and drives with participants in our research, during which they enacted, visualised, and discussed their experiences of driving while we video recorded. The examples we discuss demonstrate how participants' feelings of trust—that is, of having a sense of familiarity and confidence—when using a technology are not necessarily only or directly related to the technology itself or the person's interaction with that technology, but are, rather, contingent on sometimes hidden knowledge or circumstances.

Hakan drove Sarah and Vaike along his usual commute to work, as Sarah video recorded, we noticed a small toy hanging from the side of his steering wheel and asked about it. He told us his kids were given it in a burger restaurant about ten years ago, and he believed it brought him luck. He explained how 'I don't believe in myths but for some reason I still believe in this guy … for some reason … I've been so close to hitting so many times but I never hit them but I don't know why.' In fact, he told us, a particularly intense experience occurred just after they got the toy:

> My son got sick when he was 3 months old and we were really out in … we had like 300K to the hospital and we had to drive because he was getting problems breathing … I was speeding definitely because we really had to rush to the hospital, and then the moon disappeared behind me, and I realised that if I would have been one tenth later I would have hit the moose. Because the moose almost ran into the car, and this has happened to me several times … then for some reason I connected this incident to that incident, … I thought, OK, trust this guy.

Hakan's story expresses the uncertainty associated with driving and how people cope with it. He did not trust the toy itself in an interactional sense. Rather, it had become part of his car and driving experience, which invoked and symbolised a feeling of familiarity and safety. Likewise, having particular things with them in their cars enabled similar feelings for participants in other studies. For instance, in Sweden and Brazil, Pink and colleagues' (Pink et al. 2018a, c) participants found it hard to even imagine driving without their phones or would return home for them if they were forgotten. The car-smartphone configuration, and the affordances and relationships to which this extended, was integral to the constitution of a driving situation in which they could trust. Indeed, people take many things in their cars, to feel relaxed and enjoy driving. For instance, Anneli in Sweden discussed how she had things in the car that were never or rarely used, showing Thomas a fire extinguisher, snow shovel, candles, blankets, and umbrella, and explaining, 'I am [a] safety addict, one extra-large first aid with candles, jump cables and all. It's from If [insurance company] with everything.' Rather than trusting technologies to keep them safe, our ethnographic research suggests that people create situations in which they feel safe by bringing together certain objects, processes, and relationships: the toy, smartphones, and the multiple items in the last example all do this in different ways. Thus, rather than asking if people will trust emerging technologies like AD, we might better investigate how feelings of familiarity and

confidence are configured through particular combinations of things and processes. Our research with five families who participated in Volvo Cars' DriveMe experiment demonstrated this in practice.

Each family was given a Volvo XC90 car with a number of high-level driving assistance systems to use for period of one and a half years on an everyday basis, accumulating experience of the car and developing routines of using it over time. The early stages of our study with these families suggest participants' feelings of trust and confidence in the automated features of the car were contingent on specific circumstances and were not constant. For example, the husband in one couple explained how he initially learned about and gradually got to know the research car by understanding what it could and could not do in everyday traffic environments. He felt comfortable using the driver assist feature during a certain stretch of his commute to work, as it meant that he did not have to cope with 'the feeling of stress and annoyance about queuing in traffic … you put that [driver assist] on and … you don't look so much to the road and you trust it … and you're already in the tunnel'. However, this feeling of trust did not endure in all circumstances throughout his route. For instance, when he used driver assist and it drove at 70 km/h, he felt that 'everyone's passing you, then its stressful … you see everyone driving by you … the heart beat goes up'. He explained this by saying, 'There's a rhythm and flow in the traffic and if you're not in it … when it's too slow … it's so annoying to keep track of it, [so] it's very relaxing, very good to let the car take care of that; but when they are driving [at] 90, then it's the other way again, very stressed, … you are not in the flow.' Similarly, the feelings of trust could shift as the road environment changed. For example, on certain parts of his commute route, he was relaxed and felt he trusted the car; in other instances, the couple felt uncomfortable with how the car drove on a particularly curvy stretch of road. Here, the husband commented that he would have liked the car to 'remember how I used to drive and then try not to take the curve … even though I put it at 70 it's a bit sharp, 55–60 is a good feeling'. Thus, participants' feelings of confidence and familiarity that the experience of driving engendered in them were contingent and varied according to the different elements and processes that configured each different set of circumstances. Their degree of trust is not fixed and cannot be measured, but, rather, it is flexible and refined in each situation. Again, the implication is that it is not emerging technologies in which people will trust, but rather the way in which these technologies are embedded in particular and contingent material and social circumstances.

These brief ethnographic scenarios have implications for how we might understand emerging technologies anthropologically. For scholars in geography and STS a critical theory of the positioning of the AD car calls for attention to what happens around the car, the socio-technical systems in which it participates, and the wider environments it exists in and impacts on. Their focus on the AD car itself inevitably leads to a critique of the focus on the AD car itself, yet such centring of the car in the analysis has simultaneously sustained academic discussion about AD and ironically maintains the central status of the

AD car in the debate. Our ethnographic examples indicate that to the conceptual and analytical categories needed to understand how people will feel with AD cars require a focus not directly on the car itself, but on how its materiality and future imaginaries become entangled with the intricacies of everyday life materialities, logistics, and experience. Therefore, we should focus theoretical and methodological interest in emerging technologies not only on the technologies themselves but on the present and possible future lives and worlds in and with which they will be engaged. The case of AD also demonstrates compelling practical reasons for this. Emerging technologies, such as AD cars, do not emerge in isolation; they are accompanied by other emerging technologies, business models, material and sensory environments, and social practices. These entangled, or contiguous, processes of change need to be accounted for.

Conclusion: Insights for the Anthropology of Emerging Technologies

In this chapter we have argued, and demonstrated through the example of AD cars, that anthropologists have a scholarly and interventional role to play in existing definitions of emerging technologies as a category, as well as in interdisciplinary explorations of specific emerging technologies. Through the example of trust in self-driving cars, we have revealed how academic, industry, and policy approaches to AD cars are bound up in a solutionist innovation narrative that is technologically determinist. We have shown how an engineering-led survey study of AD ethics framed people as rational decision-makers. By attending to critiques of such approaches within our cognate disciplines of human geography and sociology, we have shown how their commentaries and arguments unsettle the assumptions that underpin technologically determinist approaches. Instead, they alert us to the need to attend to the emergent everyday circumstances within which trust in AD might come about. Turning to anthropologies of trust we showed that existing literature in this field has paved the way to understanding trust as situated, contextual, and emergent, rather than as transactional or interactional. This approach aligns with the design anthropological approach we introduced at the beginning of this chapter. Our ethnographies of AD were interventional in that they went beyond observational ethnography and long-term fieldwork to engage with people in re-enactments, set-up situations such as meals, and in using AD features. Our ethnographic findings contributed to academic publications as well as to the production of ethnographic translation materials, which are used to question and probe in industry and policy contexts, discussed elsewhere (Pink et al. 2020).

Thus, we have outlined the basis for shaping an agenda for the anthropology of emerging technologies, rooted in anthropology, but engaged with other disciplines and across multiple sectors. Anthropological perspectives rooted in ethnographies of everyday experience account for the sensory, affective, and anticipatory. They thus extend and situate the theoretical and methodological

work of cognate disciplines through uniquely anthropological dialogues between ethnography and theory =. Therefore, the anthropology of emerging technologies should be nurtured within interdisciplinary academic research contexts, as a theoretically and methodologically strong and convincing mode of understanding. However, to advance an anthropology of emerging technologies we need to be engaged both in the academy and to work collaboratively in the sites of their emergence. This involves participating in and commenting on public debates, engagement with industry research partners through actions including co-research, creating and working with ethnographic translation materials, and inviting an international community of scholars and researchers to collectively develop this field.

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Notes

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CHAPTER 10

Computational Ethnography: A Case of COVID-19's Methodological Consequences

Digital

Anders Kristian Munk and Brit Ross Winthereik

Anthropology has a computational past. As early as the 1960s, ethnoscience was seriously pursuing a formalist and computationally enabled analysis of culture with the aim of discovering what were essentially 'cultural algorithms' or rules that a stranger would need to follow in order to pass for a native (Hymes 1965; see also Seaver 2015). Yet, as ethnoscience was excluded from the ethnographic canon (see, for example, the scathing critique in Geertz 1973), so was—for a while at least—the ambition to work computationally in anthropology (Seaver 2018).

Recently, however, the anthropological interest in computation (Fortun et al. 2017), big social data (Manovich 2011), and digital methods for pattern recognition in large datasets (Munk and Jensen 2015) has been rekindled. On the heels of this renewed interest in computers for the analysis of ethnographic materials comes the question of how it challenges what ethnography is. What, if anything, changes in how anthropologists generate and analyse empirical material and with what effects? With this question, we do not mean to imply that an anthropological interest in all things digital will automatically lead to a

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