Thinking with Monsters

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Abstract. Optimistic instrumentalism dominates the narratives and discourse(s) that attend recent technology advances. Most future-studies methods in current use depend on projecting properties, processes, facts or conditions of the present into the future. Absent is substantive engagement with the human condition and day-to-day life such technological futures entail. To critique the dominant discourse on future worlds, we offer *thinking with monsters* to disclose 'living-with-technologies' and the social, political, and economic alternatives to the optimism that pervades our rational instrumentalism. We argue that shifting the focus away from facts and towards *matters of concern* engenders a critical voice that enables participation in research that produces the (future) worlds that we seek to explain and understand.

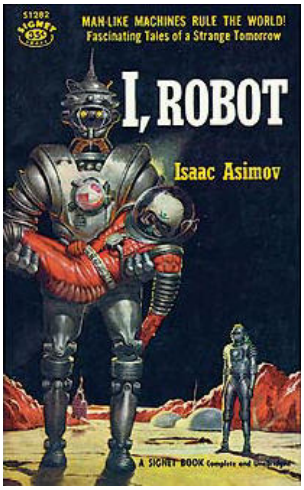
Keywords: Future(s), Monsters, Socio-technical, Matters of Concern.

Three Laws of Robotics

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.

2. A robot must obey orders given it by human beings except where such orders would conflict with the First Law.

3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.



1 Introduction

Asimov's Three Laws of Robotics are a science fiction staple and shape modern narrative expectations of robot behavior. The Laws of Robotics (written in 1942, well before the phrase Artificial Intelligence was coined at Dartmouth College[1]), conjure intelligent robots into societies in the Future. Asimov did not predict robot behavior based on existing knowledge, but rather imagined what the lived-world would be like if such technologies permeated everyday life. In imagining distant and unknowable worlds, Asimov articulated new social, political and legal assemblages in which Robotics would make sense. He illustrated what dwelling in the world would feel like by narratively removing/collapsing the unknowns and uncertainties of the future world.

Through hundreds of novels and short stories, the socio-technical-political world of robots and humans illustrate and explore the dynamics of new social orders. At the time of publication, these visions of a pervasive penetration of inscrutable technologies unsettled people by articulating future states of affairs in constant motion, constantly becoming [1] rather than predictably extending the present. New actors, neither solely organic nor solely technological, but rather cyborgs and positronic hybrids inhabited the future. Asimov's Laws of Robotics reflect the recognition that during large-scale technological shifts, "that which appears for the first time and, consequently, is not yet recognized" will co-construct substantive cultural changes. In addressing living-with-technologies [2], the Robotics narratives echo Derrida's (1995) exhortation on cultural change to "prepare yourself to experience the future and welcome the monster" [3 p 385].

Some imaginary futures, such as Asimov's Robot Series and Philip K Dick's "Minority Report", exposed the tensions and tradeoffs between that which we believe we control and that which is Other. In doing so they recognize that a "figure of the monster … surfaces, in one form or another, *in any attempt to imagine worlds radically different* from those that look threatening in the present" [italics added: 4 p 325]. These authors disclose day-to-day life in new world(s) where cultural changes produce destabilizing versions of the future. In some instances, embedded technologies are implicated in morally repugnant or monstrous manipulations of society and humanity.

Interestingly, many of the social dynamics in those stories are now an unnoticed condition of present social life. Was the undesirable lived-world (e.g. ubiquitous surveillance, denial of human rights; lack of "being left alone") of those futures not sufficiently of concern to avoid? We see with frequency "the futures we are getting hardly seem like the ones we explicitly decide on; they are more like the messed-up ones we are drifting unwittingly and implacably into" [5 p 170]. We posit that alternative discourses can provide "intellectual structures from which IS research can respond to the needs of our future society… we must then ask whether and how our approaches to inquiry can affect our ability to do so" [6 p 1]. In becoming sensitive to the disharmonies of living with technologies we can reveal further work to be done.

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[1] https://www.dartmouth.edu/~ai50/homepage.html

The Laws of Robotics underlie a broad narrative that encodes future artificial intelligence(s) as being predictable, subject to rules, and thus controllable and benign. The imagined social order became the background against which to explore and express what it means to be human, or machine, or Other and to interrogate the implications of such technologically saturated worlds The present-day deployment of potentially world-altering technologies including autonomous vehicles, Artificial Intelligence(s), nanotechnology, and the Internet of Things, is largely viewed as beneficial and non-problematic [7]. Like Asimov's robots, the implications of these technologies are worthy of concern for those interested in social and environmental well-being. The unavoidability of some future state of affairs (even stasis) would suggest that intending to influence, shape, or create a desirable future would be an area of concern for individuals, business, and society.

While Asimov and Dick wrote in the science fiction genre, the range of future-studies spans predictions, scenarios, foresight, science fiction, artifacts from the future and other techniques through which academics and practitioners can engage with futures. Yet researchers frequently conceptualize future(s) as a continuation of the present and amenable to rational inquiry. Consequently, IS and management oriented academic literature which focus on 'scientific' techniques do so through:

> *"Omission and simplification [to] help us to understand – but help us, in many cases, to understand the wrong thing; for our comprehension may be only of the abbreviator's neatly formulated notions, not of the vast, ramifying reality from which these notions have been so arbitrarily abstracted" [8 p xxi]*.

One such omission is the role of current research as actively creating value-laden technological change. Instead, corporate entities, celebrities, cultural gurus, online-bots, and algorithmic influences shape the dominant narratives about the world we can have and should desire.

Regarding the role of critique, Latour suggests that perhaps in the world of academics the wrong questions are being asked:

> *"My worry is that it might not be aiming at the right target. […] Generals have always been accused of being on the ready one war late….. Would it be so surprising, after all, if intellectuals were also one war late, one critique late….. It has been a long time, after all, since intellectuals were in the vanguard" [9 p.224]*.

In this essay, we present a means of critically interrogating the societies, culture(s) and peoples' relationality with technologies in future worlds through material and discursive engagements in the present. We do not focus attention on technologies *per se*, but rather on disclosing future world(s) of embedded technology. We look to literatures and research practices which can mobilize future research by making the familiar strange, yet connected to our present day. We can engage the future(s) by *thinking with monsters*.

2 *The Thing*: A Focus on Matters of Concern

Current narratives, both academic and industry-based, predominantly articulate 'the future' in a very optimistic manner in which technologies play a determining role as objects and tools of the world. The future itself is conceived as a continuation of the past/present, which we must prepare for and adapt to through a variety of discovery techniques.

If we instead consider future(s) as produced by social, cultural, and technological activity, not merely as a container for such activity, we can look to Latour's "celebrated *Thing*" (2004) as a gathering; a focusing of attention. Latour cites the example of the 2003 televised hearings which "assembled to try to coalesce, to gather in one decision, one object, one projection of force: a military strike against Iraq. … it was an assembly where matters of great concern were debated and proven – except there was much puzzlement about which type of proofs should be given and how accurate they were" (2004 p 235). The *Thing* provides a metaphor for grounding research on the assembling of networks of participants, values, materials, and actions in - future - technologically saturated world(s). From this perspective, researchers are offered an arena of activity and discourse to disclose future world(s) from multiple perspectives.

In many areas of inquiry, including science, when members of a community agree on the (temporary) stability of certain facts, basic concepts, interpretations, and modes of reasoning, they simultaneously mark off zones of ignorance and uncertainty. Common future-studies approaches including predictions, scenarios, and forecasting, treat the future as knowable, at least in part, but do so by restricting the world to a zone of extrapolation from known facts. These techniques largely render hidden the very every-dayness of the world of people who dwell. Yet living with technologies [2] and the worlds in which such technologies exist and make sense is notably absent. For example, novels and novellas based on the Three Laws of Robotics made visible the ethical dilemmas created when action is dictated by computational logics and questioned human treatment of 'intelligent' and empathetic beings.

The field of IS is oriented to change, novelty and innovation. But the practices, laws, social norms, and institutions which underpin the experience of living in a technological future are performed, not given, and are not of necessity positive changes. We need not accept socio-technical futures as a question of facts or as resistant to research concerns. Some aspects of research "must of necessity rest on elements of reality (concepts, proposals, matchings up, results...) which are considered irrefutable and firmly established" [10 p 206]. Matters of concern happen when researchers shift attention to the actors, assumptions, processes, and unknowns upon which irrefutable facts are agreed. As in the discussions about going to war in Iraq, the potentials and the scope of many current technologies to reshape societies invite alternative perspectives, values, and voices by which to illuminate the coordination of action and how objects, environments, technologies and people may become meaningful – in the future.

In providing alternative access to the future, we seek to develop researchers' ability to know how, and when to think differently instead of assuming continuation of what is already known. Problematizing [10-12] the concerns of the futures "would require

that all entities, including computers, cease to be objects defined simply by their inputs and outputs and become again things, mediating, assembling, gathering …" [9 p 246] and include the rich abundance of everyday experience which comprise future worlds [13].

Futures are "unpredictable, uncertain, and often unknowable, the outcome of many known and especially 'unknown unknowns'" [14 p 1] and simultaneously essential for all individuals, organizations, and societies to consider. What the future is and who gets to define it a contested space that has garnered much attention throughout history [14-16]. Many future-studies approaches uncritically accept the facts, mechanisms and processes used in predictions, scenarios, forecasts, and similar techniques as stable and unproblematic. Latour offers the example of the Columbia explosion as the "transformation of a completely mastered, perfectly understood, quite forgotten by the media, taken-for-granted, matter-of-factual projectile" [9] into a gathering of media, volunteers, scientists, engineers, experiments, and locations – a matter of intense focus and concern. In reframing our consideration of the future as matters of concern we emphasize that our research orientations regarding future(s) may also embrace the highly complex, future-situated experience of living with technology. *Thinking with monsters* does not draw back a metaphorical curtain to reveal a future that already exists but instead responds to the idea that "our research practices are performative…. and produce the very world(s) that we seek to describe and explain" [17 p 64].

2.1 The Monster

Monsters have long featured in the stories of humanity. Used as objects of heroic deeds (in Greek myths), for illustrating the hubris of Man in grasping life-giving powers [18], or for demonstrating how Minotaur-like hybrids reveal our own hidden intentions and unspoken desires [19, 20], monsters hold a grip on our imagination. Foucault's characterized the Monster as combining the impossible and the forbidden and that "its existence and form is not only a violation of the laws of society but also a violation of the laws of nature" [21 p 55]. Monstrosity arrives through a variety of means and serves multiple functions. Monsters can be physical entities terrifying and manifest – somehow solid and of this world. As compound beings, or Others, distinct yet akin to us, monsters are menacing, unknown, uncontrollable and can serve to unite us against a common foe.

But monsters in literature can also reflect anxieties of our own humanity – they serve as a mirror to our own fears of unknowns by opening space in which to see ourselves and the Other as reciprocally constitutive [22]. Monsters can "demonstrate, monsters alert us, … monsters act as a moral compass" [23] to show us something unseen and alert us to values and concerns to which we have not attended. A monster can be unnamable and when we speak of it, "it becomes slippery, heterogonous, and nebulous; it evades, but it also invades the imagination as a valuable experience of absolute Otherness" [22 p xii] thus inciting consideration of something we should know - but do not. In this sense, the strange familiarity of technologically saturated future(s) are monstrous. They are unsettling: the inscrutability of motivations, unease

about the futures imminent arrival, and our inability to predict, foresee or control what is about to happen.

Many of the concerns which have emerged in our present world around fairness, morality, and life/death decisions made by robotic algorithms [24], featured prominently in Asimov's fictions. From this view we see Asimov's Three Laws of Robotics as stabilizing the unknowns of something that did not yet exist, thus enabling concerns only noticed in 'making the familiar strange' to be voiced. He echoes Derrida's sense of monsters which "shows itself in something that is not yet shown …. it strikes the eye, it frightens precisely because no anticipation had prepared one to identify this figure" [3 p 386]. Asimov's Robots Series discloses how people and machines coexist and meanings change. Robots exist in a contested space and enact different realities. At the same time his future(s), while uneasy, enables us to enroll in research concerns and value identification in our own time.

2.2 Historical Futures

Concern with the future is as old as humankind itself. What fearsome animal may lurk on the path ahead, what foods may be found along the way, what conditions may arrive with those dark clouds, were likely issues for hunter-gatherers. Oracles, prophecies, divinations and various forms of future-telling have been prevalent across historical societies and still capture the common imagination. From throwing bones to reading palms, from automatons to planetary alignments, and from tea leaves to goat entrails, humans have sought to know and perhaps control avoidable histories [25-27].

Numerous metaphors for the future underlie and shape the epistemic stance of the variety of future-studies. The future has been likened to a foreign country in which we are always arriving but never sure where we are. It is sometimes compared to a book yet to be written, or a journey we must navigate [28]. Others maintain the future is existential making, in which materialities push back on human intentions in the co-constitution of a world [29]. The epistemic stance revealed by these metaphors directs researchers' approach to futures as predicted, discovered, created/built, or socially imagined. What is consistent is that individuals, institutions, businesses, and governments all anticipate, plan for, and pursue the future as a mainstay of their varied agendas.

Modern future-studies on the West can be divided into three periods [16]: 1) the advent of rationalism and technological forecasting and the growth of professionalism of future and systematic development of alternative futures (1945-1960's); 2) institutionalization and industrialization of worldwide futures discourse, and normative futures involving business communities and decision-making processes (1960's-80's); and 3) risk-society discourses, with a narrowing and fragmentation of efforts emphasizing foresight for specific companies and technologies and a focus on strategic planning.

This historical account reveals that people previously engaged vigorously with techniques to interrogate the implications of futures based on what action possibilities were observed in the present time. Large institutions (e.g. The Intergovernmental Panel on Climate Change, the European Strategy and Policy Analysis System), the

RAND Corporation, and governments have developed and continue to successfully deploy a subset of future-studies methods which provide exemplars of how seeing the future(s) in alternative configurations reveals contested space (e.g. [30-32].

In general, future-studies focus on specific technological aspects and abstractions of what is to come. For example, authors have focused on the philosophy of technology to examine how IS research might inform future-studies [33], the destructive capacity in algorithmic decisions [24], and on methods of future-studies [2, 14, 28, 34]. In other streams of inquiry, the future is contested, agential, and orchestrated, with a greater focus on the role(s) of actors and metaphor [35]. There are few instances [24, 36] in which academics expand the typical range of future-studies to disclose aspects of living-with-technologies which are often absent in traditional research.

This disengagement raises the question of who owns the future? The narratives about futures are rife with consulting firms offering to future-proof companies, techniques intended to help executives navigate the unknown, and governments and militaries looking at risks and opportunities with scenario planning. Businesses take a dominating role in the development and implementation of ubiquitous and often invisible technologies and forms of organizing. The intellectual situation is analogous to arguments by Vannevar Bush, as head of wartime research at the end of World War II, who articulated the need for scientific knowledge production to remain independent of government control [4]. The monster he deployed was the shadow of Soviet Lysenkoism as political interference in the realm of science, a "disturbing image that challenge[d] and threaten[ed] the performance and reaffirmation of desired social order" (ibid p 56).

3 Future-studies: a categorization

Dozens of techniques have been developed to apprehend futures. Research in megatrends [37, 38] and socio-technical innovation [39-42] indicate that historicity and path-dependencies have a strong influence on possible futures. The future is not an empty context-free place for exploitation. Numerous factors, including the materialities of infrastructure and information [43], technologies [44], organizational routines [45], and social structures [46] impose constraints on what can change, how fast change can occur and for whom change occurs. Different configurations, goals and values of 'the present' in locales and societies influence the potentialities of different futures.

The techniques of explanatory theory, prediction, foresight, and scenario-building lock our inquiry into specific ontological assumptions of the world and how the world becomes known. They privilege the empirical and the external, are locked into the dominant cultural assumptions and obscure imagination and social innovation [47]. Many future(s) research techniques build in assumptions of stability and the continuity of the present (e.g. a state of the future is determined by a state in the present). But futures are not value free [33, 44] and the values we aspire to create possible, plausible, and preferable futures.

Latour's [48 p 156] suggestive metaphor: "Scientific facts are like trains, they do not work off their rails. You can extend the rails and connect them but you cannot drive a locomotive through a field" illustrate the challenges of researching future(s). Our scientific episteme break an immensely complex world into manageable parts [12]. But living in a world with new forms of organizing, work, medicine, and government is located in the metaphorical fields between the rails. In disclosing future world(s) we must loosen the grip of our episteme as the only methods by which to create and evaluate knowledge. Researching the complex futures involving Artificial Intelligence(s), global climate change, genetically modified organisms or nanotechnology involves an examination across multiple unknown fields, not just where the various scientific 'rails' run. This is particularly crucial when we are interested in the human experience and the attendant policy, regulation, and social implications of future world(s).

The uncertainty in our knowing is a direct result of holding tightly to our scientific episteme. Entering the spaces between the rails requires us to enter zones of unknowns and uncertainties. Research which discloses futures through critical interpretation of technological and policy innovation narratives [2, 33] can challenge the underpinning of technological rationality. The pathways to these futures are neither linear nor determinant and multiple interventions, social and biophysical conditions and values will shape the realization of future(s). These zones of uncertainty – the present and future(s) beyond our epistemological mapping are precisely where social imaginaries [4, 49, 50]; design anthropology [51-53], and science fictions [54-56] and artifacts from the future [57] are revelatory. They disclose new worlds by collapsing uncertainties (of the future) while maintaining a reflective continuity with our empirical experience based on the slowly or non-changing aspects of the durable present [2]. The imaginative visions of the future, while not definitive of what will occur, supports discourse on what society desires in futures.

The wide range of futures studies techniques do not disclose worlds or sustain discourse equally. We cluster them (Table 1) based on the extent to which they allow epistemic distancing from our tightly held assumptions of where the future lies.

Table 1. Categories of Future-studies Methods by Epistemic Distancing.

	Assumptions	Method	Epistemic function
A	The future exists and can be discovered. The future is an extension/extrapolation of the present/past; current explanations of phenomenon are stable; provide prediction and normative guidance.	Prediction/ Forecasting Best Practice Delphi Studies Scenario Thinking Fringe Sketching	Reliant on the acceptance of one (or few) factors which are determinate the future. Often focus on outcomes regarding specific technologies, companies or sectors
B	The future is created through choice and action. Challenges current social and	Design Anthropology Thought Experiments Antagonistic Scenarios/	Reliant on assumed fundamental aspects of human, social and/or physical sci-

	technological trajectories through speculative design; human-oriented interventions to address ill-defined, 'wicked' problems; challenge current knowledge as "it could be otherwise".	War Gaming	ence principles (e.g. markets, technological scalability, rationality) rather than specific determinant factors; Focus includes a variety of social, political or economic outcomes.
C	The future is actively imagined and socially accepted; encode what is possible through technology, business and shared social vision; connects innovation in science and technology to power, social orders and justice.	Socio-technical Imaginaries Speculative Design Artifacts from the Future	Epistemic distancing through active imaginative work to disclose assumptions underlying socio-technical assemblages and normative order. Reinterprets/challenges existing normative values to highlight dis-harmonies.
D	Radical extrapolation (Reductio ad absurdum) or vivid imagination to expose values in the present. Highlights ideals and values as enacted in perfect worlds (/or the opposite – anti perfect worlds)	Science Fiction Utopia/ Dystopia Fictions	Value-laden depictions reveal discontents and the conditions people seek to obtain/avoid. Epistemic radicalism; purchase on the dynamism of social change challenges the assumptions of institutional, knowledge, political, and social structures.

These categories are not exhaustive but are sufficient to illustrate that a variety of futures studies approaches in different fields have fruitfully engaged in discourses and practices. It is beyond the scope of this essay to review each of these techniques/ methods. But while it is possible to find academic research using techniques in categories A-B, there are few examples that draw on the speculative and imaginative techniques in C-D. Given what is at stake we suggest that "technologies, like the people who use them, have social lives and so one must imagine the social futures as well as improvements…" [28 p 14]. Narratively removing/collapsing uncertainties, can ground and sustain discourses regarding what worlds allow these technologies to be enacted and values we are deliberately or unwittingly creating. In addition to techniques which identify non-changing aspects of the durable present [2] we need discourses about what is at stake and who we, as a society want to become

4 Thinking with Monsters

In presenting 'the monster' as the unease produced by realistic accounts of future worlds with which we are both familiar and estranged, we open a critical orientation

to our current research practices. The monster surfaces when imagined worlds challenge our accepted material, social, and intellectual categories which can no longer be taken for granted. The monstrosity of Victor Frankenstein's experiment was not the creation of an embodied being but the challenge to the triumph of science at the time, condensed into the problem of life itself.

Thinking with monsters is a research orientation that embraces the unknowns between the rails of our episteme to ground a critical discourse. This orientation temporarily collapses what cannot be known (the social, economic, political aspects of the future) into discernable narratives, artifacts, or richly described social worlds. This stands in contrast to the epistemic probabilities of prediction, forecast, scenarios and similar techniques which discard, obscure, and leave unattended and unvoiced) the very matters of every-day living with technology.

The use of social imaginaries, science fictions, and artifacts from the future can expose social/political norms, conventions, and values that might 'break' or become unrecognizable in a world where a powerful technology has become the background of everyday life. Richly describing the lived-world of future(s) can 'make the familiar strange' in ways that challenge our assumptions of continuity across past-present-future. This estrangement or distancing effect is attributed to Bertolt Brecht and can produce a critical framing of technologies and systems [58]. Estrangement is perceived as an alienation from what would be a seemingly familiar empirical environment. Analogous to entering a familiar room where all the furniture has been rearranged, we recognize the broad outlines but struggle with an undefined Otherness. The effectiveness of thinking with monsters resides in the dialectic of familiarity with an [alternative] mundane technologically rich environment and the estranging sense of Otherness. This orientation enables critical reexamination of the configurations, relationships, and practices of our world. Foregrounding these aspects of social/political/economic/environmental life enables research which focuses on "what is not said, what matters are rendered hidden, what grievances never get formed" [59 p 4] in many of the future-studies approaches.

Our initial example from Asimov illustrates the monstrosity of a [future]-everyday inhabited by those things "born perhaps slightly before their time; when it is not known if the environment is quite ready for them" [60 p 71]. Such a fictional imaginary is based on a cognitive continuum with the scientific understanding of the day and is thus distinguished from fantastical worlds or folktales. But the narratives are not about science or technology but rather the social conditions which enable the technologies to flourish.

We highlight here the manner through by categories C-D of futures-studies (Table 1) can disclose the unsettling conditions for which we are not yet prepared. For example, science fiction worlds [56], social imaginaries [4, 50], and world disclosing [61], can estrange us from our everyday practices through imaginative illustration of 'it could be otherwise' overlain on our empirical experience. The seeming ordinariness of a future for which we are not ready creates a "monster [that] violates the law by its very existence, it triggers [a] response of something quite different from the law itself" [21 p 56]. This violation of what we expect triggers a critical interrogation of our

knowledge, beliefs, and values and may challenge both our optimism and our instrumental narratives.

4.1 Monstrous futures

We offer an example of how the monster surfaces when imagined worlds challenge our assumptions of how technologies enter our collective lives. Steven Spielberg's 2002 movie Minority Report (loosely based on P.K. Dick's short story of the same title [62]), focused on how technology reconstructs society:

> *"Imagine, a world without, murder. Six years ago, the homicidal rates had reached epidemic proportions. It seemed that only a miracle could stop the bloodshed…. Within three months of the pre-crime program, the homicidal rates in the District of Columbia had reduced 90 percent."*

The original story and the subsequent screen adaptation were written well before current ubiquitous data collection practices, the use of algorithms and machine learning to enable policing and sentencing programs, and a range of government and corporate platforms to track and influence our social, material, political, and economic lives.

In the imagined world of Minority Report, the institutional, legal, and social acceptance of predictive algorithmic technology disclosed a style of governance and social interaction. Shops identify customers through face/retinal scans and manipulate people through predictive marketing, while the government's capability for constant tracking and surveillance is background state of affairs.

Minority Report allows us to inhabit the trade-offs and the morality of an interconnected surveillance state and geographical targeted advertising through face/retinal scans. Its familiar yet strange world surfaces the tensions between the individuals' sense of being stalked and the societal need for safety, security, and a market economy. The story enabled a critical examination of such tradeoffs and foregrounded many of the tensions and social implications of the present-day world of smart phones, machine learning, workplace analytics, alongside the ubiquity of data collection through platforms like Amazon and Facebook. It crystallized the interconnectedness of social constructions and technological capabilities.

More than decade after the movie, researchers raised concerns regarding economic and societal transformations due to the "the blurring of long-established social and institutional divisions … organizations and their relations to individuals qua users…" in a landscape where data is a core component of commercial strategies", [63] cited in [64 p 76]. Inspired, in part, by a 2009 interview revealing that Google retained individual search histories that could be made available to state authorities and law enforcement agencies, Zuboff [64] articulated the incipient production, circulation and distribution of power in this new world – 'surveillance capitalism'. By disclosing emergent logics of accumulation, and experimentations in a world of surveillance and attendant economic incentives and structures, she gathers researchers to an agenda requiring careful analysis and theorization.

Thus Zuboff has grounded a substantive gathering, matter of concern and emphasizes that the "trajectory of this narrative depends in no small measure on the scholars

drawn to this frontier project" (2015 p 86). But, the practices associated with capitalizing on (big) data and the challenges to privacy and self-determination that Zuboff calls attention are the very ones that were laid bare in Minority Report more than a decade earlier.

4.2 Bringing out the Monsters

Many of today's technical and scientific advances (e.g. synthetic biology, planetary-scale systems, large scale social engineering, virtual and augmented reality) challenge our factual understanding of how technologies fit into our organizations and processes, our global society or even our physical selves. When focusing on the social and material conditions of people, social imaginaries, science fictions, and artifacts from the future enable us to consider emergent roles and relationships when living with these technologies has become "every-day". Approaches that (temporarily) collapse the unknowns in monstrous futures enable researchers to join the vanguard of research which creates those futures.

For example, emerging technologies that will soon be able to create realistic avatars – animated hyper-realistic human characters, that look, behave and sound like real people [65]. Such 'digital humans' are already being deployed as digital assistants, models for fashion houses, clones of deceased artists or fake versions of heads of state. The speed with which digital humans may enter our lives conceals the uncertainties about how, where, and what is at stake as they do so. What grand challenges will they help address and what problems will they create?

We illustrate this with an "artifact from a future" where digital humans are part of the furniture of the world. A (futuristic) employment separation letter (Figure 2) specifies departure terms for an employee by reminding them that their personal digital avatar – a realistic avatar that can be puppeteered in real time for teaching apart from them – will remain at the company's discretion for 20 years.

THE UNIVERSITY OF SYDNEY

Private and confidential

Walt Gregorovich
Executive Director, Business Education
27 July 2021

Sandra, Peter
133 Castlereagh
Sydney, NSW 2000

Dear Dr Peter,

I am writing to you about the conclusion of your employment with The University of Sydney Business School on 30 July 2021.

This letter seeks to clarify your departure terms as discussed in our face-to-face meeting.

Your personal digital avatar will remain at the University's discretion as per the terms of your employment for 20 years. We wish to remind you at this point that you will be contacted for consent for any physical alterations of your avatar, and we may deploy/ or retire your digital avatar without notice.

Whilst you are not obliged to do so, you may wish to notify us of any changes that are pertinent to your digital avatar in the coming years.

You will receive your final pay check on July 31.

Finally, if you wish to take part in an exit interview with HR for internal data purposes, it would be greatly appreciated, though you are in no way obliged to do so.

Thank you for your service to the University of Sydney. We look forward to your digital self remaining in the lives of our students for many years to come.

Yours sincerely,

Walt Gregorovich
Executive Director, Business Education

PLEASE KEEP A COPY OF THIS LETTER FOR YOUR RECORDS

Fig. 2. Artifact from the future: employment separation letter

The letter raises concerns regarding power, identity, authenticity, and deception in a landscape infused by digital humans. It triggers a critical interrogation of what values, copyright and legal issues, and social norms might be challenged and allows us to articulate potential research agendas. Other imagined artifacts might include obituaries of "AI personalities", news articles or policy documents concerning working would autonomous agents.

5 Discussion

Future-studies methods has been the subject of a rich body of work in other subject areas (e.g. political science, philosophy, Future studies, and literary studies) where fictional realities allow researchers to access, inhabit, and explore the possibilities of divergent tomorrows. We orient these ideas to envision the every-day living with those technologies that were 'born before their time'. This Thinking with Monsters discloses how worlds would re-arrange (or not) around new tools, technologies or the practices which include them. By collapsing future(s) into a (temporarily) stable form we may engage rationally with technologies' functions and properties but also create a different quality of engagement, which highlights meanings and the practices that implicate technologies. Thinking with monsters offers a new "way of seeing" by re-considering the assumptions and asking questions regarding the future(s) our technologies create. What are their implications for the values we pursue, our ways if interaction, and our social lives? Who is responsible (and in what way are they responsible) for understanding technological futures and mitigating their unintended and often undesirable consequences. Thinking with monsters discloses new territories and thus enable research that allows us to ask different kinds of questions. It offers a provocative approach to interrogating the possible, desirable, or regrettable implications of technology deployment and to explore what we value today and how imagined tomorrows can be obtained or avoided. Thinking with Monsters shifts the discourse to questioning the lived experience of humans in the world.

These imaginaries can be revelatory. For example, the universal translator described in Murray Leinster's 1945 novella 'First Contact' [66], and explored in science fiction from Star Trek to Doctor Who, is now proposed to support conversations in 40 languages with Google's new headphones. In a world where machine learning is poised to provide us such advances, Star Trek and Doctor Who not only inspire us to build a universal translator, but also reveal that word translation itself cannot resolve conflict or overcome differences in culture. These human issues must be worked through carefully to create a livable future [28].

At the time Asimov imagined the Three Laws of Robotics, robots were figurative, not real - plausible, perhaps possible, both attractive and repellent. The challenges these narratives surfaced regarding ethics, intelligence, autonomy and consciousness continue a research discourse regarding the social implications living with such robots would require. A similar discourse is ongoing with Zuboff, O'Neill and others prompting concerns regarding the (Big) Otherness of corporate power, what constitutes privacy under conditions of surveillance, and justice and fairness of broadly deployed algorithmic decision making. This research is an important response to observed technological and social effects in the world. Equally important is proactive critical engagement with the social-political and economic implications yet to come surrounding numerous technologies, which will co-constitute likely and maybe even desirable futures. Imaginative research grounded can help establish current research concerns and critically identify the tradeoffs being made as our research performs our future(s). In this view, the monster has shifted from a manifest and threating technology artifact to our own existential ambiguity of a lived present and our anticipated,

but uncertain future. Through imagining the activities of people in the presence of new technology, the social world and the cultural expressions important to both the present and the future are revealed. Acts of imagination can work to (temporarily) collapse the uncertainties of the future into a focus for discourse, research, and action.

6 Conclusion

We have argued that thinking with monsters provides academics a critical voice, to paraphrase Aristotle's Rhetoric, "into the things about which we make decisions, and into which we therefore inquire [and] present us with alternative possibilities". This voice is crucial in shaping research *matters of concern* in reframing and recalibrating current technology implementations and attendant policies that constitute futures and the articulation of values in the present. Scholars involved in the development and deployment of technologies that co-constitute organizational and social life can utilize novel and bold ways to engage with futures and provide alternatives to the dominant future(s) discourses. Catalyzing public and business engagement regarding highly impactful technologies is crucial as they become increasingly and inexorably involved in the way we live and work.

The academic discourses revolving around technological changes have been largely concerned with the qualities, inputs, and outputs of the technologies and closely related business or economic interests. Alarms have been raised, and concerns voiced, but usually as autopsies of events – to the facts of the Challenger spacecraft accident [9] or to Cambridge Analytica's revelation of mass data exposure. This form of post hoc analysis of conceals questions of values and politics: "Who gets to decide on the agenda for scientific research and development? Who gets to say what problems or grand challenges we try to solve? Who gets to say how we solve them (or resolve them or muddle through them)? Who gets to partake in those benefits, and are they the same people put at risk by our attempts to solve the problems at stake?" [18 p xvii]. *Thinking with monsters* discloses the social-political-technological worlds in which technologies make sense in the everyday and brings into focus the world from within. The emergence of research concerns thus provides a critical narrative to the development and deployment of powerful technologies of enormous consequence. This enables an intention to build a future to dwell in, founded on the premise that "the forms humans build, whether in the imagination or on the ground, arise within the currents of their involved activity, in the specific relational contexts of their practical engagement with their surroundings" [67 p 10]. By working imaginatively with technology and researching social life with the Other, we can augment current research activity on immediate factual matters with attention on the meanings and aspirations which accompany our technological assemblages.

Our current research activity on immediate factual matters will unwittingly become our future, for better or worse, if we do not focus attention on the meanings which accompany our gadgets and gods. At the 200th anniversary of Shelley's "Frankenstein", it is valuable to be reminded that it was not the monstrous being who was of concern but the "social consequence of that science…a being rejected by his creator

who eventually turns to violence…he is an embodiment of social pathology" [68 p 65]. Shelley reflected on the inability of humanity to identify and reflect on the social products and consequences of science and technology. This is critical at our current time as widely implemented technologies become inscrutable even to those who design them, as we lose sight of who and what is controlled by those technologies, and as businesses take a greater role in organizing our lives and shaping our knowledge and preferences. *Thinking with monsters* enables us to gather attention on concerns and values which we want to inhabit. As Latour [9] suggests, a Future that is always being built as an ongoing construction, is in need of great caution and care.

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