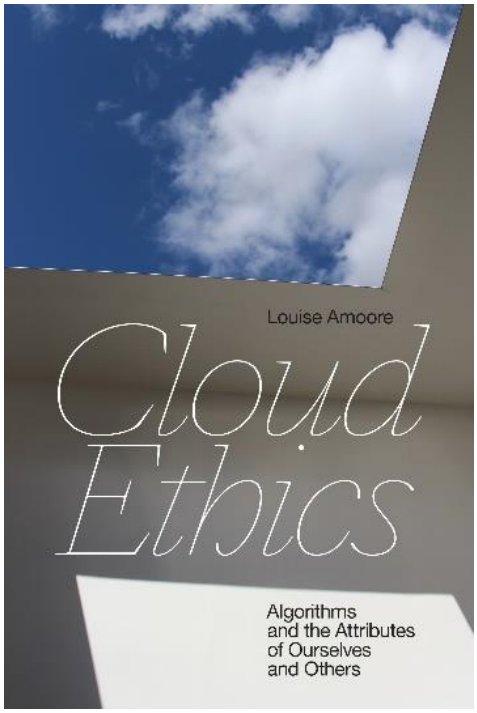
Cloud Ethics: Algorithms and the Attributes of Ourselves and Others



Louise Amoore. Durham, NC: Duke University Press, 2020. 232 pp. $25.95 paper (ISBN 9781478008316, $99.95 cloth (ISBN 9781478007784)

Introduction by Andrew C Dwyer, Department of Geography, University of Durham, UK, and Nathaniel O'Grady, Humanitarian and Conflict Response Institute, University of Manchester, UK.

We are delighted to introduce this forum on Louise Amoore's *Cloud Ethics: Algorithms and the Attributes of Ourselves and Others*. The book presents an extensive critique and re-thinking of our relation to the 'algorithmic'. Along with excavating how algorithms are transforming the production of knowledge and practices of managing life (ranging from surgical robots and their neural network algorithms, to the US National Security Agency's SKYNET to detect anomalies for 'kill lists' using random forest algorithms), the book also inquires after the wider effects that algorithms bear upon ways of thinking and acting that are increasingly constitutive of contemporary political cultures. Amoore's contribution substantially advances our understanding of the ethical and political considerations necessary for navigating this ever-changing world.

Amoore's work builds upon an increasing focus on the role of *political theory*, *democracy*, and *justice* that resonate with her earlier book, *The Politics of Possibility* (2013). It also subtly offers a methodology for the social sciences to intervene in discussions upon the algorithmic, through reading against the grain of technical books and fabulation as a tool of critique. Many studies discuss how one can articulate a technical response, *or solution*, to

algorithms, but Amoore takes a different tack; arguing that critical political theory can challenge the arrangement of algorithms rather than simply signaling that there is a possibility at redemption through technical intervention and calls for greater transparency.

This review forum stems from a planned Author Meets Critics session that, due to the COVID-19 pandemic, never went ahead with the cancellation of the in-person 2020 annual meeting of the American Association of Geographers (AAG) in Denver, CO. Despite this, we found that the book offers such a profound contribution to geography, and cognate disciplines dealing with the algorithmic, that all the contributors thought it important to continue this discussion in written form. Commentaries by Pip Thornton, Till Straube, Emily Gilbert, Andrew C Dwyer, and Nathaniel O'Grady, delve into a fascinating array of interpretations and critical reflections on nuanced readings of *Cloud Ethics*. Louise Amoore then offers her author response.

Ultimately, the forum celebrates a book that synthesizes many of the concerns Louise has engaged with for some time. And in so doing it reflects the essential contribution she has made to the study of algorithms, politics, and ethics. Combined, the commentaries – and the book – add new dimensions to an ongoing conversation that seeks to address the effects arising where algorithms imprint themselves on increasingly numerous, and often obfuscated, aspects of our lives.

Commentary by Pip Thornton, School of GeoSciences, University of Edinburgh, UK

I wandered lonely as a cloud ethicist…

I've been wondering about clouds lately too – lonely ones, fluffy ones, dark, ominous head-filling ones, but also clouds in their relatively new digital incarnation. In particular, I've been thinking about the *word* 'cloud'. Not *wordclouds* as such – although they are actually quite relevant too – but the economic and metaphorical value of the word 'cloud'. The value of tech-metaphors such as 'cloud', or 'host' in systems of digital linguistic capitalism such as Google's search and advertising platforms has been the focus of much of my research to date (2017, 2018), and it is therefore the writing and authorship angles of Louise Amoore's *Cloud Ethics* to which my attention turns in this review. The whole book is a remarkably fresh and original argument for an ethical response to the amalgamation and attribution of data in algorithmic systems. I am assuming the other critics will respond to the more technical aspects of the book, so I will stick mainly to my words…

Amoore's work is rarely far from the richness of metaphor, so often based around the cultural and linguistic deconstruction of various media from films to scientific experiments, and I remember an early conversation with her where she somewhat conspiratorially suggested I should submit a PhD chapter to my supervisor in the form of a poem. We share a similar appreciation of both the value of literature and culture in both academic and personal capacities, which not only drew me to the book, but also provoked some questions – or more accurately, ruminations – on the complicated relationship between algorithms and language, and how they might be provoked and/or resolved through the application of cloud ethics. I have arranged these thoughts into brief provocations which in themselves act as 'hinges' on which an extended discussion of cloud ethics might turn.

The first 'hinge' I came across in the book was the well-rusted dichotomy of **author/reader**. The application of Foucault's 'What is an author' (1988) to the writing of

code and algorithms is fascinating and productive, although I wonder if there is more to be said about the space left behind by the absent author in terms of economic motive. I will return to this later, but I also wonder here if there is something to be thought about not only the responsibility/attribution of authorship, but also of that of the reader. I'm thinking here about proof of reading – both in terms of code and words. This might relate to accountability, but also in the realms of plagiarism. What ethics are involved in the processes of attribution and citation, for example, when texts are available and readable, but can be forever claimed unread; how can you prove that someone has read something? There is something interesting here about proof of reading (a different kind of *proofreading*, perhaps). I'm thinking eye tracking technology for one, or timed contractual tick-boxes or training courses which force you to wait the amount of time it would take to read a script before moving on to the next page. These are all technologies which purport to attribute cognition through reading, but in effect only provide temporally stamped simulacra which serve a bureaucratic or corporate purpose.

This brings me onto some thoughts about time, and the hinge between **present/future.** I am a huge fan of Amoore's work on the data derivative (2011) and the projection of future meaning she expands on in the book, and find it fascinating to think of such predicted meaning when it comes to data that represent words. As Amoore mentions in Cloud Ethics, the progression of algorithmic processing of 'natural' language can be traced through various technologies that "are no longer seeking exact one-to-one matches of semantic meaning; rather, they are building predictive models of what might come next. They are, in short, inferring future worlds from their exposure to text" (p. 89). This inference of future worlds through algorithmic reproduction of text, and indeed the danger of such technologies, is what I mean when I talk about *subprime language* (2019). As words on the web become economically valuable because they draw audiences to adverts (i.e., Google Ads

/ AdSense etc.), what those words actually say becomes less important than what they are worth, which hinges on the projected values of words based on how well they have performed in the past. But when viral stories, rumors, memes, click bait and fake news can spread so far and fast – often as conduits for advertising dollars – *what they actually say* and do in the world is critically important. But because the economic value of words has become detached from their political and social agency as conduits, the words themselves become unstable as carriers of narrative.

Indeed, the relationship between **ethics/value** is my third hinge. Amoore insists that "a cloud ethics must be able to locate ways of being together that resist the algorithmic forces of attribution" (p. 170). While trying not to be too defeatist, I do want suggest that any discussion of the ethics of cloud/digital/AI systems must be more firmly situated in the context of its proprietors and gatekeepers, and the value they extract from these systems - namely the big tech companies. And while *ethics* remains bound within the systems of digital capitalism, and while whole industries are built up around stitching together disparate data points to identify and target people, I'm not sure it will ever be possible to "resist the algorithmic forces of attribution" (p. 170). Recent events within Google's AI Ethics research team, for example, have highlighted the problematic relationship between ethics and profit. Indeed, I would go so far as to say that in today's digital economy, the space left by the absence of the author (as per Foucault) has been filled by capital, which explains the ever-increasing toxicity of online discourse.

I want to look now to a critical hinge on which scholarship has turned for centuries – that of the **spoken/written** word. The first mention of written text in the book comes in the introduction where Amoore describes coverage of the Freddie Gray protests in Baltimore in 2015. She notes that "even the written text embedded within social media images—such as the "police terror" placards carried aloft and captured on Instagram—was extracted by a

neural network and became features in the algorithm" (p. 3). And it is traditionally primarily the written words populating social media chat that form the datasets on which predictive algorithms feed. Yet there's something interesting here about internet '**chatter**', or '**noise**' – both terms used by security and intelligence organizations to describe the (often very meta) data harvested by systems of surveillance – and it's something to do with the ability of the algorithm to 'see' written data a lot more easily than spoken data. Even with the advent of VOIP, home assistants, and other smart IoT technologies, the spoken word still retains a certain degree of illusiveness in a world where written, scanned, typed and searched data is so readily 'readable' by algorithmic systems. Actual audio 'chatter' and 'noise' are (at the moment at least) ironically less susceptible to scraping than written words, perhaps living up to their metaphorical, *meta-datorial* usage in security settings, and satisfying a perhaps traditional Socratic means of counter-surveillance.

Of interest here to is the opposite of chatter/noise – and that is silence. I'll call this hinge **absence/presence**, because I can't think what to call the oppositional side of the hinge to 'silence' when I don't mean 'noise'. I was struck in the book by Amoore's attention to the artistic and stylistic importance of omission in literature. She cites John Fowles', a self-proclaimed "deep believer in silence — the 'positive' role of the negative" (p. 100). And indeed, in literature and poetry, rhythm and scansion, and later in forms of concrete and digital poetry, the gaps on the page (be that paper or web) do indeed "oblige the reader to help form the text" (p. 100). The omissions here – the 'silences' - add value to the text; they add meaning. But I wonder how this translates to algorithmically processed spoken data, when muted video calls, conversations unspoken, answers unsought, and idle Alexas fail to add value to algorithmic systems and are also unprofitable to systems of digital capitalism.

Fabulation/tabulation: My final hinge is my favourite and is a bit of a linguistic indulgence. In the book, Amoore sets her task to "find ways to amplify the fabulation of the

algorithm, to enter the breaches in the writing so that the force of the unknown can be felt" (p. 103). Fabulation, in this context is a wonderful descriptor and metaphor. It makes me think of the calls for the 'reclamation of serendipity' of early search engine research, or Fuller and Goffey's (2012) Evil Media strategy of making the accidental essential. But more than this, I like to think of fabulation as an antidote to tabulation. I think we definitely need more of the fabulous and less of the 'tabulous' in the way algorithmic predictions and assumptions do their work in the world.

Cloud Ethics is definitely fabulous, not tabulous. It is a richly critical and metaphoric exploration of the algorithmic systems that govern our lives. A cloud ethics insists that algorithms can never be apolitical because they operate by, on and among the inputs and indeed digital outputs of people and environments, and thus can never "be neutral or without bias or prejudice" (p. 75) either. But instead of calls to 'un-bias' algorithms, or open black-boxes, Amoore recognises that 'bias, assumptions and weights' – unpredictably fabulous algorithmic narratives – are actually incisive "routes into opening up their politics" (p. 8). And this is what I try to do with my own work – to insist on the politics of algorithms by making them tell stories about clouds.

Commentary by Till Straube, Department of Human Geography, Goethe University Frankfurt, Germany.

At the core of Louise Amoore's *Cloud Ethics* lies an account of algorithms as situated reconfigurations of socio-political relations, and a quest to come to ethical terms with distributed agencies, identities, and responsibilities across algorithmic operations. The book achieves this through an illuminating and thorough portrayal of the technical, textual, affective, and fantastical lives of machine learning algorithms that defy any reductionist interpretation.

Cloud Ethics is therefore a highly recommended read for any researcher looking to make sense of algorithmic phenomena, even if the ethical implications of algorithms are not at the forefront of their minds at the outset. The text is effortlessly engaging and challenges the reader to think about how algorithmic reasoning shakes the very moorings of ethicopolitical thought—well beyond the "moral" question of "what algorithms may or may not do" (p. 165). Amoore convincingly derives a conceptual toolkit that helps us think about the mechanics by which algorithms enable iterative, derivative modes of perception within autopoietic boundaries of meaning *(apertures)*, about the impossibility of conventional notions of accountability in an algorithmic mode of practice that poses its own illegibility as a starting point *(opacity)*, and about positions outside the algorithm about and from which to make political claims *(the unattributable)*.

For such an abstract avenue of argument, *Cloud Ethics* is a remarkably accessible and well-illustrated text. The author draws on empirical encounters with algorithms that are assigned a wide range of ethically fraught tasks, such as recommending cancer treatments, steering surgery robots, surveilling borders and protests, detecting credit card fraud and terrorist threats, or placing suspects at a crime scene. She treats each example with a thorough

concern for political context as well as technical implementation and draws out the specific complications they pose for ethical reasoning.

The book's analysis is furthermore supplemented by archival research on the cloud chamber - a device that 100 years ago allowed experimental physicists to trace subatomic particles through condensation - and an interpretative reading of Richard Feynman's report on the *Challenger* disaster (Ch. 5). The former serves as a metaphor to think about the "cloud analytic" as a site for making perceptible and recognizable traces and patterns in complex data sets (p. 49), the latter is an opportunity to discuss the discursive positions from which we can explore modes of doubt involved in algorithmic knowledge-making (Ch. 5). Both are pivotal moments for the book's argument, and also indicative of its unusual style of inquiry, which bears some discussion.

When the author relates encounters with software engineers and computer scientists during field work (pp. 1f., 67, 162f.) she positions herself as a researcher outside communities of algorithmic practice looking in. *Cloud Ethics* is noteworthy in that regard, because social science research concerned so deeply with the workings and implications of digital devices is often tied to a claim of technical expertise. This is especially true in geography, where a certain kind of "techo-positionality" (Wilson, 2015: p. 31) is at times worn as a badge of honor.

Its tacit framing as an 'outside' perspective informs *Cloud Ethics* on a superficial level, in that descriptions of technical workings tend to rely on verbatim quotes and focus quickly on selective aspects that are conducive to the book's arguments (pp. 11, 35, 71). More importantly, however, it provides the basis for a unique mode of inquiry that embraces ambiguity: Where a more literal-minded scholar (as technical professionals tend to be) would provide definitions, contour meanings, and generally work against uncertainty, Amoore will

draw on elaborate etymologies (doubt/dubitare/hesitate, p. 142; error/errant/traveling, p. 119), thus folding multiplicities of meaning into an unapologetically associative style of argument. Working 'from the equivocation', *Cloud Ethics* frequently uses polysemy de-centering technical terms (e.g. "bias", pp. 75, 106; "attribution", p. 90; "stream", p. 101) and even homophones (weight/wait, p. 164) as liminal spaces where arguments can be developed more freely and infused with a productive semantic tension.

By virtue of this distinct style, the reading experience can take on the invigorating energy of a brainstorming session. I found myself scribbling more associations in the margins: What is the ethical subtext of Git's *blame* command that will disclose the author of any particular line of code in a collaborative project (like the ones described on p. 97)? Could the *signature* support the *attribution* in equivocating pattern analysis with the authorship of texts (p. 90; cf. Cooper, 2020)?

Clearly, a lot of linguistic sensitivity and skill is involved in deploying ambiguity in a lucid prose that remains focused and never distracts from the real ethicopolitical concerns at stake in the book. But how much of Amoore's technique is writing style, and where is it a deliberate method to draw out meanings and frictions from a notoriously elusive object of inquiry? Just as neural nets iteratively build semantic connections from uncertainty and doubt, *Cloud Ethics* demonstrates that critical social science research can employ linguistic ambiguities in a targeted way to contribute compelling accounts of the technologies in question.

The author draws heavily on postmodern theory (Foucault, Derrida, Deleuze) as well as feminist and posthumanist philosophy (Haraway, Barad, Hayles). While these references are consistently fitting, helpful and evocative, the text avoids delving deep into narrow aspects of this literature in order to relate it to ethical questions of data analysis

(cf. Mauthner, 2019). *Cloud Ethics* is also not concerned with constructing a heuristic with which to systematically approach the ethics of algorithms, as Mittelstadt et al. (2016) have proposed.

Instead, Amoore expertly uses phrases and concepts from theoretical texts as anchor points in order to draw her own connections through the empirical data—projecting, tracing, lightly weaving associations. It is through the intersections and interstices of these connective chords (as it were) that the outline of a strange figure emerges: In a series of detailed portrayals from different conceptual prompts, like studies of body parts in an artist's sketchbook, the text affords us partial glimpses of the algorithm *as an entity*, without ever running too much of a risk of reifying the various associations that surround it.

In consequence, *Cloud Ethics* presents machine learning algorithms not simply as a technological challenge to the ethicopolitical status quo, but as *something to relate to* in ethical ways and with which to engage politically. In pursuit of this ethical counterpart, the text frequently doubles down on figures of speech that imbue the algorithm with human-like reasoning, e.g., when it characterizes the algorithm as "full of doubt, and yet it decides with indifference" (p. 149). This becomes most explicit when the author explores the pronoun "we" as applied to human and machine (pp. 56-58) and when she discusses the "madness of algorithms" in chapter 4. Ontological considerations aside, this technique is productive because it elicits from the reader a curious intellectual empathy with the algorithm, which helps in pinning down some of the text's core ideas.

While Amoore's deliberate figuration of the algorithm stays clear of anthropomorphic platitudes, it seems to brush up against its conceptual limits when it comes to notions of embodiment. For example, the text builds on Haraway's 'embodied objectivity' (1988) when it contends that "doubt (…) is felt, lived, and sensed as embodied actuality in the process of

an algorithm learning through its relations in the world" (pp. 139f.). What body is drawn into consideration here? The immediate context seems to suggest that machine learning algorithms *themselves* can be thought of as embodied practice, but the passage does not explore this perspective any further. Amoore most explicitly articulates the embodiment of machines in her analysis of the amalgam (touching, cutting) motions of surgeon and robot (p. 62). And in the chapter on madness, she draws parallels between the pathological brain and algorithmic reasoning, referencing cybernetic theory (p. 114).

But the intriguing notion of algorithmic embodiment remains vague, and it would have benefitted the book's arguments to establish a more robust sense of the concept. Some opportunities to explore the topic further may lie in cybernetic engineering *practice* that aimed to put intelligent machines in direct material relations with their environment (Pickering, 2002, Parisi, 2013: 193ff.), in Mackenzie's (2015) intriguing notion of 'mindful infrastructures', or in Gabrys' (2019) fascinating work on sensors.

A further exploration of this topic of algorithmic embodiment is not only desirable because it could tie up some (contestably) loose ends conceptually. It is also a promising enterprise towards providing critical research in the social sciences (and in geography in particular) with much needed *sites* for ethnographic encounters with algorithmic figurations.

To be sure, Amoore is correct in her repeated, decisive criticism of the black box as a methodological device (pp. 5, 67, 73, 151). The black box is best understood as an engineering technique and a rhetorical device to be treated with suspicion, rather than a 'thing out there' to pry open in a quest for transparency and accountability (Straube, 2020). The profound difficulties with picking apart and tracing precise associations through complex and proprietary digital devices give rise not only to an ethical conundrum but also to an impasse for conventional research methods.

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Amoore lays the groundwork for alternative strategies to situate algorithmic reason. If "Cloud II" is a mapping device (p. 33), it would be interesting to learn more about the spatial frames of reference that are being put to work in the algorithm: What are the (sensing, gathering, projecting) operations involved in mapping an environment onto a specific feature space? By what interfaces does a given algorithm relate to data infrastructures, and to the world at large? What can we say about the material entanglements that persist through conceptual cuts of measurement, calculation, and surveillance *because* algorithms are an embodied practice?

Cloud Ethics is a rich source of ideas and unconventional ways to think about algorithmic modes of being that are sure to inspire scholars for years to come.

Commentary by Emily Gilbert, Department of Geography, University of Toronto, Canada.

Generative adversarial networks (GANs) were on my mind when I was reading Louise Amoore's intriguing new book, *Cloud Ethics: Algorithms and the Attributes of Ourselves and Others*. GANs are used to generate new knowledge, about people, places, prose, etc. Two neural networks (computer algorithms that are meant to emulate the brain) train themselves to recognize probabilities across data - effectively they are set against one another in a competitive zero-sum game until they can generate new data, based on these probabilities, that is convincingly realistic. In other words, GANs are being used to produce fakes that appear to be real. And not just fakes but deepfakes: for example, creating an image of a person who seems to be very real, but doesn't exist, or a real person seeming to say something that is totally falsified. (For a very compelling example of the latter, see this video that blurs Barack Obama's face with Jordan Peele's speech: https://www.youtube.com/watch?v=cQ54GDm1eL0).

GANs can also create new landscape features. Data can be inputted about a site - derived, for example, from open-source software - and its topography or features can be redesigned. This could be a realistic image that that shows a bridge crossing a river, where there is no bridge, and maybe no river. As evidence has emerged that satellite images are being hacked in this way, militaries have become particularly nervous about their tactical operations in foreign fields that rely on these kinds of maps and images. The US has upped its investments in GANs precisely for this reason, but also to counter China's fast-moving advances with these technologies.

What are the ethical grounds for engaging with and even disrupting these new technologies? It is these questions that Amoore tackles in *Cloud Ethics*. While the futures opened up by algorithmic technologies do portend a kind of brave new world, Amoore is

careful to cast the political and ethical questions that they throw up within a longer genealogy. Nothing is entirely new, and we can - and need - to draw from other moral orders to grapple with what is unfolding, no less because existing codes (moral and computational) are the foundation for the technologies that are being designed. This looking to the past to grapple with the ethicopolitics of algorithms is, Amoore argues, what is necessary to disrupt what she calls their 'double foreclosure' of the future, which is both reductive (to a single output) and pre-emptive (limiting what futures algorithms set out to create).

Amoore draws from a wide range of mostly-Western examples to think through "a speculative strategy for reinstating the partial, contingent, and incomplete character of all algorithmic forms of calculation" (p. 21). She does so across six registers that counterpose the ethicopolitical arrangements of algorithms with other frames of knowledge-making in terms of particles; entanglements; the authorial; (un)reason; doubtfulness; and multiplicity. Her examples open up the 'black box' with which algorithms are usually understood to foreground their partiality, contingency, hybridity, irrationality, uncertainty, and complexity. In doing so, she troubles our understanding of algorithms by illustrating how they exceed the terms of their creation.

This has significant ramifications for addressing the biases locked into algorithmic decision-making, whether discriminative or generative. All algorithms are premised on sorting, of one kind or another, and thus inherently inscribe and reinscribe prejudice in some way. The consequences of these biases have been addressed by scholars on inequity and surveillance such as Simone Browne, Virginia Eubanks, and Safiya Noble. Amoore draws upon these literatures and others to make her arguments. But her opening of the algorithm shows that the political intervention cannot only be targeted to the original code, as if tweaking the computation will smooth its biases. And yet, these are the kind of strategies that are often imagined, as was the case with the Algorithmic Accountability Bill proposed by

New York City Council of 2017. The problem is that they misunderstand the ways algorithms work and are thus ineffective at addressing accountability. Not only is authorship of the code impossible to determine, assembled at it is across human and non-human entities, but also the non-linear learning embraced by the algorithm also renders authorship redundant.

For Amoore, the ethics that she encourages us to imagine "does not belong to an episteme of accountability, transparency, and legibility, but on the contrary begins with the opacity, partiality, and illegibility of all forms of giving an account, human and algorithmic" (p. 8). It is precisely where algorithms exceed their constraints that Amoore wishes to reorient our focus so that we can refuse double foreclosures. Doing so provides a much more nuanced account of human and non-human entanglements in computation. It is less clear, however, how racial and other biases can be addressed.

Furthermore, the question still remains: if we attend primarily to opacity, partiality and legibility where does that leave us with respect to thinking about how algorithms get operationalized? This move seems to shy away from holding to account the effects of algorithms, while fixing our attention to their design, even while this design is being troubled. To put the question differently, in pushing the reader to acknowledge and embrace the *excess* of algorithms, does this limit our ability to think of refusal beyond the algorithm itself?

This brings me back to the example of military uses of algorithms, which I mentioned briefly above. One key point made in *Cloud Ethics* is that algorithms are in themselves not moral entities that are either good or bad, with which I concur. But yet, they can and do get used for things that we might want to distinguish as either good or bad. The military is one such example, as it applies algorithms in ways that are not only about geopolitical mastery, but also potentially lethal. Military investments in GANs and other forms of algorithmic computation—especially Artificial Intelligence—are not disrupted by the recognition that

algorithms are partial or complex. Indeed, it could be argued that this complexity is precisely a driver for investment in research and development. It is the excess that the algorithm promises that is fueling the new arms race around Artificial Intelligence—not destabilizing it. While this excess does not predetermine how the algorithm gets wielded—for cancer surgery as opposed to military targeting—it is the excess of the algorithm, its unruliness, that is driving military anxiety, and propelling the urge to command and control.

Maybe the problem with algorithms is not (only) their double foreclosure of the future (or a kind of *scarcity* of futures that they portend), but precisely that the excess of their design has meant that they can be put to so many uses, and seep into so many domains—security, migration, surgery, military targeting, finance (all of which are engaged with in the book). These are difficult questions, and Louise Amoore's *Cloud Ethics* provides a compelling intervention into the contemporary uses of algorithms that pushes us to consider these questions, and many more.

Commentary by Andrew C Dwyer, Department of Geography, University of Durham, UK.

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Amoore's *Cloud Ethics* offers an exciting excavation of the deeply problematic 'ethicopolitical' relationships of the contemporary algorithmic moment. In a thorough and imaginative book, she identifies what I think is a key democratic and ethical question of our time: how do algorithms limit claims to alternative futures yet to be decided? In this review, I bring justice to Amoore's contributions on regimes of recognition, ethical 'codes', and offer reflections on geographical themes that emerge in a critique that situates algorithms within an obscured, dark, and opaque doubtfulness of posthuman decision.

Recognizability

In assessing posthuman sensibilities, Amoore weaves together various *regimes of recognition* that form new hybrids of an ethicopolitical 'we'. In Chapter 2, we encounter Intuitive Surgical's da Vinci robot. Here, the robot is not isolated, but mingles amongst surgeons, cloud computing, and application programming interfaces (APIs) that "contain the data residue of multiple past humans and machine movements" (p. 59) that open up "[w]hat it means to be intuitive, to touch or feel an organ" (p. 62). That is, the robot renders visible and visceral data points from the past for the surgeons. This is not all too dissimilar to what I witnessed with malware in an endpoint detection provider, where algorithms permit singular actions to be simultaneously teeming with a multiplicity, which is also present "in the autonomous vehicle, the drone, the smart borders system" (p. 64). The capacity to encapsulate big data, to morph weights in convolutional neural network algorithms, then "actively generate recognizability" of, and for, the world (p. 69). For me, this post-human attentiveness is essential in assessing who 'we' are. How do algorithms and future action become shaped by the collectives of the past – in this case surgeons or in the capacity to

detect the ‘unknown’ malicious code? This indirectly has significant contributions to discussions on affect and computational agency that move beyond themes of control and autonomy to state an-already pervasive posthuman sensing that cannot be allocated to a liberal, rational subject.

Amoore’s contribution, I find for my work and thinking, is most persuasive in the discussion of the production of norms and anomalies. That is, how are *we* producing new forms of recognizability that condition what is considered ‘normal’? Amoore could further address how calculative norms and anomalies then become translated as ‘normative’ norms and abnormalities – and how this *we* permits and constrains certain forms of translation. The capacity for machine learning algorithms to actively generate the conditions of recognizability is arguably dependent upon the capacity for the differentiation of calculative anomalies; that opens a question to whether algorithmic forms of recognizability are more violent or damaging than another. In the wake of Black Lives Matter and long histories of black activism and scholarship, such as by Simone Browne (2015), algorithmic forms of recognizability build upon, and entrench, racist and colonial histories. How does this *we* – ethicopolitical publics (re)shaped through posthuman recognizability - then work here? I think this is at least partially attended to through a turn in our attention to the ethicopolitical conditions and implications over what becomes recognizable rather than focus on an already and necessary condition of bias. As an algorithm exhibits both a necessary bias in its architectural arrangement (in order to function) as well as its learning data, she recognizes the importance of the latter but also the “limit points” of the former, where attempting to address inequalities through adjustment to learning data will never wholly resolve bias. *Cloud Ethics* understands that the collectives of big data of our past selves that machine learning algorithms collect then close down the possibility of the future and the democratic capacity to

say ‘no’ to algorithmic recognizability. Is there ever a reason for an algorithm to decide that an individual has a propensity to commit a crime or to become a ‘risky subject’?

Closing Down

As a solution, some have sought to *eliminate* or *reduce* bias, through codes of ethics that identify its locus *within* algorithmic source code. Here is where we see Amoore at her most distinctive. These solutions are based on a belief that algorithms can be open, transparent, and visible. Instead, *Cloud Ethics* details how we must rather deal with opacity, doubtfulness, and partiality. This is most clearly addressed in Amoore’s thinking around writing and authorship, particularly in conversation with Jacque Derrida’s work, to offer how writing always escapes its author, and that one can therefore not step back to the ‘source code’ of the algorithm (p. 95). Amoore then claims, by attempting to seek an origin source, that we miss that the algorithm is already unreasonable because we “disavow the madness that haunts all decisions” (p. 120). Here we can see two strands of core thinking, one on recognizability I previously outlined and another on the partial knowledge of any decision; algorithms are not mad, but rather extend logically to come to a decision. Here is where I think further attention could be paid to *what* computation does that is not just writing, are humans all but of an inscription that escapes ourselves? Is an algorithm an “ineradicably, and perennially, a political being” (p. 75) only in its activation with the human? This may add to Amoore’s insightful claim that, as algorithms work in only partial knowledge of us, they must be understood doubtfully, as they incorporate the incalculability of this. As writing exceeds the author, source code cannot encode ethics, nor does training engineers to be ‘ethical’; but rather we must realize how the algorithm draws together multiple others into the decision and produces a singular output to decide upon. Therefore, the power of algorithms lays in their capacity to form new collective forms of recognition *and* the ‘objective’ singular decision that is devoid of its partiality and doubtfulness.

Amoore characterizes this closure as the aperture amid a dangerous democratic moment as partiality and doubtful are expelled in the singular output. When I have listened to Amoore speak, I have questioned if thresholds, set by designers, are key. Yet, I admit I did not recognize the radical politics underpinning such thinking at the time. As Amoore says, "what kind of political claim, not yet registered as claimable, could ever be made if its attributes are known in advance" (p. 4). That is, what do contemporary algorithmic regimes foreclose? They close down the future, which means there is no ethicopolitical resolution through tweaking an algorithm's thresholds for a 'better' output as their *raison d'être* is to condense the incalculable of the world into something to be decided upon. Therefore, relying on a code of ethics is always lacking in its ethicopolitical focus, because it is not the (always impossible) liberal, rational human subject as the locus of responsibility but a collective, posthuman coming together which forecloses, in algorithmic architectures, conditions to claim alternative futures.

Scenes and Terrains

For geographers, I think this aperture invites some interesting reflections on the new spaces of the political. Amoore describes the aperture "an opening that is simultaneously a narrowing, a closure, and an opening on to a scene" (p. 16). However, for geographers, what then constitutes, performs a scene, what is such a *place*? Do the *terrains* of algorithms offer new spaces to investigate politics and move beyond what Amoore calls 'Cloud Forms' that overly focus on the spatiality of cloud computing infrastructures through 'Cloud Analytics'? What may be some methodologies to approach such a space? As Amoore says, "a cloud ethics must be capable of asking questions and making political claims that are not already recognized on the existing terrain of rights to privacy and freedoms of association and assembly" (p. 81). I suggest that Amoore is offering glimpses to a new terrain that is itself posthuman in how it crisscrosses across big data, algorithms and their weights and

probabilities, cloud computing, our movements and so on, which form new ethicopolitical relations. Perhaps this notion of terrain could be productive to engage with cloud computing as "a novel political space of reasoning" (p.42). Does this potential undulation, friction, and variability constitute spaces that permit opacity, unevenness, and the conditions of politics? These are only speculations to how geographers may engage with such a complex, and essential, work on algorithms to critically interrogate how and where ethicopolitical arrangements are produced beyond tracing data centers and cables, and one that offers fruitful pursuits that transcend a sometimes-parochial appeal of 'digital' geographies (which is not mentioned in the book).

In an age of pandemic, Amoore's book does not lose its vibrancy, but instead illuminates the technological solutionism of algorithms, as exemplified by 2020 UK school examinations results being dictated by algorithm (and which were eventually dropped, at least for some) as well as issues about the 'good' employee working from home. These are not new phenomena and Amoore cautions against a focus on computational autonomy rather than the danger of foreclosure, the aperture of the democratic. Rather, we must be aware of the reduction of "the multiplicity of potential futures to a single output" (p. 80). Her call then asks geographers and others "to engage experimentally in algorithmic fabulation" (p. 158). We must be able to then offer alternative stories and futures to avoid falling into an extinction of political claims against the ferocious onslaught of algorithmic 'certainty'.

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Algorithmic narcissism?

Algorithms bear some kinship to prevailing imaginaries around madness. At least this is what Louise Amoore, in her excellent new book *Cloud Ethics: Algorithms and the Attributes of Ourselves and Others*, suggests. Amoore construes madness and its overarching mobilization in regimes of knowledge in somewhat different terms from how we might have become accustomed to thinking critically around it. This madness is not the one that arises when leafing through the pages of Foucault's *Madness and Civilisation* (2001), where reason is shown to be tranched from unreason and, in so doing, shapes the albeit fleeting and historically circumscribed contours of each.

Whereas such discourses of madness rely on dichotomizing oppositions, the algorithm's insanity is present in the very logics of dissension that run through its veins. Mistakes, errors, and uncertainties are not held up as emblematic of 'the mad' in order to reinforce its opposite. Rather they are incorporated into algorithms' further development. They are rooted in algorithms' ever-happening learning as it engages with and interlaces into the cultural, political and ethical realities that it increasingly bears upon.

We start to see here how algorithms instantiate a new dynamic tension between knowledge and truth. Dissension logics might be taken to show that, as algorithms extend, the knowledge they produce and the effects they consequently bring forth upon the world are ever spiraling away from the so-called ground-truth upon which they are supposedly premised. But dissension should not be taken simply to address the widening gap in the proximity between knowledge and ground truth (especially as calling something ground truth is questionable at best). Rather dissension reflects an algorithm's proclivity to conflate truth

claims with their compulsion to rearrange their own propositions in a supposed optimal form. Echoing Jean Francois Lyotard's (1984) elaboration of self-referential truth in his ruminations on what he describes as knowledge in computerized societies, this would mean that an algorithm's truth is one premised more and more on satisfying its own functionality. Perhaps the madness of algorithms its own pathological, narcissistic ego-centrism; its sociopathy and constant striving towards self-preservation.

I wonder how this madness, and accompanying recalibration of truth claims, sutures into the broader practices and rationales of governance that it increasingly informs. In particular, how the mobilization of failure, uncertainty, even crisis, seem a modus operandi of governance now- their instantiation having transformed from suggesting the limits of sovereignty to paving a way for its extension. So, what role does algorithmic madness play in this remobilization of error and crisis in contemporary forms of governance? How might algorithms figure as iconic of these new and emergent modes of power?

Encountering Algorithms

Underpinned by a logic of dissension, algorithms take on a processual character of being 'ever in-formation' (2019, p. 40). This line of thought is compelling for me because it prises open for discussion the forms of encounter that, as Amoore describes, take place between the range of actors that converge in the algorithm's (re)making. An algorithm's continuous construction is a decentered endeavor, being always reassembled at the intersection between all manner of things and cutting across different circumstances. And for me if we accept this conceptualization of its making we can start to consider algorithms in evental terms; thinking about the space-times of their development but also the affects they mediate and are sensed through.

Algorithms are felt where they reverberate across different scenes of life. But their presence is perhaps most forcefully apparent when they enact effects that could be deemed

scandalous, although not necessarily exceptional or extraordinary. Algorithms enter our awareness, then, amidst the drone strikes they orient, the stop and searches on black teenagers they encourage and where they generate lower grades for working-class children living in certain post-codes. And to these moments of encounter, rendered fungible for the algorithm because of their very glitchiness, different feelings latch: from doubt (to which I'll return) to anger, rage and, perhaps most viciously, states of impasse.

But in accepting algorithms as ever in formation (with their effects steering their development steering their effects and so forth) perhaps it would be interesting to also think through our encounters with algorithmic processes that proliferate outside the parameters of scandal. Or, better yet, how we carry feelings attached to scandal (like outrage or anger) over into our dealings with algorithms in banal settings and how these feelings morph as they move through our encounters in algorithmic worlds more generally; curating Spotify playlists, culling Instagram followers or tapping in and out of public transport. So how do algorithms settle into or float through life beyond the scandal and what new ethicopolitical implications rise to fore with their ever-deepening integration into this life?

Language and Metaphor:

Perhaps Amoore would see these feelings as one space-time where beams of light compromise the algorithm's opacity. But another, potentially unintentional 'aperture construct' might be the fields of imagery and metaphor cast to both conceptualize the material infrastructures algorithms operate across and also the practices they inaugurate. From the clouds that, in their fleeting formation, evoke the dispersion of data infrastructures to the cycles of vaporization that envisage data collection, these metaphors are rife.

I'm intrigued by how, through these semantics, algorithms are cast discursively. In other words, how this nomenclature dismisses any notion of its triviality by the fact that it contributes to defining the parameters of how algorithms are spoken about (or not), how they

figure (or don't figure) as public objects of concern and contestation and, in turn, how spaces of intervention upon algorithms may (or may not) become accessible despite the effects they bear for life day in, day out.

'Knowledge discovery', for example, is one of those terms that stand out for me in this vein; particularly how it carries the capacity to sustain, albeit with degrees of sequestration, rationalities whose epistemological violence have been present for centuries. If we follow the work of Roy Bhaskar (1986), 'discovery' runs the risk of posing reality as purely external and rife with its own properties that might be extracted, measured, indexed, analyzed and exploited. Discovery might thus reproduce old tropes of objectivity, and all its fatal implications, for the algorithmic age.

I wonder if one thing that arises at points in the book is how the language that both constitutes and ensconces algorithmic culture might obfuscate and legitimate some of its nefariousness. But perhaps conversely too what role the almost inevitable expansion of this semantic field in the future could have in generating new ways to speak, think and act upon algorithms.

Public Ethics:

Knowledge and truth, encounters betwixed in-between, discourse and action. Maybe the points I've made heretofore cut across another of the brilliant contributions that Amoore's new book makes; that of advancing significantly our thinking around an ethics for and of algorithms. Our response to algorithms, which are only initiated when their output ripples through a collective state of affairs, is something that shows their capacity to be differently enacted in the world. It is where their effects are felt, in other words, that algorithms evidence their potential to be otherwise. And conversely, as Amoore brilliantly surmises, the output of an algorithm represents the singularization out of multitudes of other futures foreclosed upon at the point of decision.

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The insistence of recognition for the multitude, out of which the singular output of the algorithm emerges is crucial to the design of ethics Amoore proposes. This ethics is premised on an elaboration of doubt as a form of relation to and through algorithms. Doubt for Amoore seems to contrast with other means to arrange ethics in the way it relates to truth and representation. Unlike the parhessia traced by Michel Foucault (see Foucault, 2011)), doubt doesn't seem to rest on a demonstration of other ways of life to evidence Truth's fallacy. Rather the efficacy of doubt incubates in its suspension of that moment of Truth found where algorithms afford an output, consequently opening up for speculation on alternative futures that would have otherwise drifted out to sea.

So, doubt makes uncertainty endure, against the foreclosure signaled by an algorithm's output. But is it important to submit doubt to the same difference, multiplicity and potentiality that it visits upon algorithms? Doubt can be lived in different ways. For every O-Ring that Richard Feynman produces to challenge NASA narratives on failed rocket launches (one of many riveting empirical cases Amoore explores in the book), there's Sister Aloysius in John Shanley's play *Doubt: A Parable* (2005) whose doubt concerning the profession to which she has committed her life is displaced and sublimated into her relations amongst others and the penchants of which she suspects them.

Algorithms need to be understood as made at the intersection between all they encounter in an ever-continuing process. And this strange new togetherness, this weird new public sphere, should be the grounds upon which an ethics for algorithmic life should be assembled. But do we also need to consider how different lived expressions of doubt enter into the public-political sphere and thus bring about different responses to an algorithm's output, changing how they are held to scrutiny as and when they give accounts of themselves?

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Response by Louise Amoore, Department of Geography, University of Durham, UK.

I write during the most difficult and devastating of times. In this context, I am grateful beyond measure to my interlocutors for their generative and generous engagement with my book, *Cloud Ethics*. Particular thanks are due to Andrew Dwyer and Nathaniel O'Grady for organizing the forum, and for their patience in curating our collective contributions. In what follows, I address some of the themes and questions that emerge across the reviews, in the hope that our conversation might foster renewed reflection on what a cloud ethics approach could be, and perhaps what it could do, as a form of politics.

Algorithms, accountability, and giving an account

The period of time during which I researched and wrote *Cloud Ethics* coincided with a growing sense of frustration with the so-called 'AI ethics' debate, and specifically the limited sense of what accountability could mean in relation to algorithms. The impulse to locate algorithmic accountability in an identifiable source code or originary author has deepened considerably since the book's completion. By 2021, we find that the European cities of Helsinki and Amsterdam are instituting 'AI registers' detailing the algorithms used by the cities and the right to human oversight of machine learning decisions. Such steps towards a public acknowledgement of the potential harms of algorithmic decisions are important, but nonetheless they are also insufficient, they fall short of what is required. The dilemma reminds me of Jacques Derrida's response when he is asked whether he rejects the idea of human rights. He replies that "we are in need of them and they are in need, for there is always a shortfall, a falling short, an insufficiency", and therefore "we must never prohibit the most radical questioning possible of all the concepts at work here" (Borradori 2003, p.132). It is this kind of radical questioning that I have in mind when I write that "one has to think some heretical thoughts on ethics" (p. 111). It does feel like a kind of heresy to claim that algorithms cannot be rendered accountable as such, and to radically question the

concepts of transparency, accountability, and explanation that are at work here. The contributors to this forum, in their different ways, have rightly returned me to the question of accountability, and to reflect on the important distinction between accountability and the giving of incomplete and partial accounts.

As Till Straube notes in his review, *Cloud Ethics* seeks to shift the paradigm "beyond the moral question of what algorithms may or may not do", and to foreground "the impossibility of conventional notions of accountability in an algorithmic mode of practice that poses its own illegibility as a starting point". There is a great deal at stake in a critique of accountability and transparency that calls for algorithms to give partial accounts, and I take very seriously the challenge distilled in Emily Gilbert's question of whether "this move shies away from holding to account the effects of algorithms". Here is a fundamental question concerned with how a society might meaningfully locate who the accountable actors are and who or what is responsible for harmful actions. What could be more important to an ethicopolitics of algorithms?

It is my case in the book that though algorithms cannot be accountable in the sense of a clear-sighted account (e.g., an "opening" of the black box, or "explainable" algorithms) they can be called to give partial accounts of their conditions of emergence (p.9). Indeed, it is this perennial failure to give full accounts of actions that is the problem of ethics common to humans and to algorithms. In placing the emphasis on partial accounts, I propose that we do not limit but precisely extend and multiply the possible sites of ethicopolitical significance. Let us consider this extension and multiplication of sites through the lens of the economies of data extraction and attribution. As Pip Thornton suggests in her review, if "ethics remains bound with systems of digital capitalism", then surely accountability must also be "more firmly situated in the context of its proprietors and gatekeepers, the big-tech companies". Though agents we could call proprietors – from Amazon Web Services (AWS) provision of

cloud services to US intelligence, to Palantir's case management algorithms for US ICE – do appear as protagonists in *Cloud Ethics*, Thornton is correct that I do not locate digital capitalism or big tech as primary sites of accountability. Why not? Surely, given that the book's opening small tech start-up pitching for government business in the surveillance of protests is now bought up by a major company, this must be a place to situate accountability for the effects on democracy and public life? My response is that the situation we find ourselves in is somewhat more serious even than the spectre of tech gatekeepers' algorithms governing every sphere of public life. I think that the difference may stem from my understanding of economy as extending to the oikos, to the attributes of population, cluster and household.[1] As I describe in Chapter One on cloud chambers, the demand that we locate spatially the power of cloud computing and machine learning (Cloud 1) has afforded insufficient attention to the economies of perception, recognition and attribution that continue to proliferate (Cloud 2). A multiplication of the sites of algorithmic accounts should mean that when we hear that a tech company has withdrawn from supplying a specific form of machine learning – such as the AWS moratorium on the police use of its facial recognition software – our first thought should be what are the regimes of recognition that will amplify and proliferate with this appearance of accountability at the point of withdrawal?

Futures and weights

Staying with the question of algorithmic harms, a number of the interventions emphasize the racist and colonial histories of algorithmic technologies (Dwyer, Gilbert, O'Grady). In seeking to pluralize the sites of ethicopolitical significance, Cloud Ethics is

[1] I imagine the book *Cloud Ethics* as a sequel to *The Politics of Possibility* (2013) in which I devote more space to elaborating the relationship between sovereign power and economies of security. I argue that "sovereignty and economy become newly and intimately correlated on the horizon of possible futures" so that alliances emerge between governments seeking to secure uncertain futures and consultants and software providers who trade that uncertainty (p. 6). The advent of advanced machine learning (documented in Cloud Ethics) has amplified the resonances between companies trading "data derivatives" and governments seeking to unmoor their actions from underlying social disintegration, discrimination, and inequalities.

concerned with the deeply racialized forms of violence that far exceed any notion of algorithmic 'bias'. By way of example, Gilbert raises the question of military uses of algorithms and reminds us that "they do get used for things that we might want to distinguish as either good or bad". As Straube also suggests, the empirical encounters with algorithms in *Cloud Ethics* span a "wide range of ethically fraught tasks, such as recommending cancer treatments, steering surgery robots, surveilling borders and protests, or placing suspects at a crime scene". Across each of these algorithmic fraught tasks, Gilbert's question is of the utmost importance: how does one distinguish the good from the bad when algorithms are themselves generating new thresholds of the good and the bad, the normal and the anomalous? In Chapter Five of the book, I discuss the Google employees who protested Project Maven's "involvement in war" and "biased and weaponized AI" (p. 146). Of course, their protest against algorithmic war is necessary, but it is far from sufficient because it "delineated good from evil, war from commerce, in ways that did not place the science at risk" (p.146). Thus, the withdrawal of object recognition algorithms from war does little to resist the Dexterity Network algorithm (Dex-Net, funded by Google and the US Department of Defense) that has the appearance of merely producing more accurate recognition of three-dimensional objects (p. 77). In short, sometimes the identification of a clear unitary agent of algorithmic harm may actually allow the racialized form of recognition to proliferate further in public space. The regimes of recognition made possible by algorithms such as Dex-Net extend the violence of war into the intimate ordinariness of bodies and objects in public space. As Achille Mbembe writes, this battle, waged against certain undesirables, reducing them to mounds of human flesh, is rolled out on a global scale. It is on the verge of defining the times in which we live" (2019,p. 100).

How might a cloud ethics open dialogue with postcolonial presence or, as Dwyer asks, “how do algorithms and future action become shaped by the collectives of the past?” Writing on the fault lines of “duress”, Ann Laura Stoler depicts the features of “colonial histories of the present”; the “tenacious qualities” of colonial effects, their stretched and “protracted temporalities”, and their “durable, sometimes intangible constraints” (2016,p. 7). The heaviness and weight of duress – like the residues of police violence lodged within recognition algorithms – speaks to the demand for racist technology to “carry the weight of its weightings” (2020,p. 163). There is much work to be done here, and I have only begun to map how algorithmic futures might carry the full burden of their politics. As O’Grady signals in his review, banal encounters with algorithms may carry the residue of anger and rage, invoking Elizabeth Povinelli’s sense that bearing the burden reaches “exhaustion” in the “mere task of surviving” (2012, p. 471). As Straube also suggests, this embodied relation to the weight of living with algorithmic foreclosures of the future is also fertile ground for “much needed sites for ethnographic encounters with algorithmic figurations”.

Politics, geographies, and resistances

In his reflections on scenes and terrains, Dwyer suggests that “for geographers” the concept of the “aperture” might open onto “new spaces of the political”. He then asks what the spaces, places and terrains of such a politics could look like, noting as an aside that digital geographies are “not mentioned in the book”. These are helpful provocations in terms of my discomfort with the formulation ‘digital geography’ and my desire to situate algorithms as spatialized arrangements of propositions that are profoundly geographical. Put differently, not all of the political geographies of algorithms are digital, and this matters for the kinds of critical intervention I wish to make. The discussion of tabulation and fabulation invoked by Thornton is illustrative here. Historical forms of analogue tabulation – from double entry bookkeeping to statistical datasets – have required the fabulations of bell curves, orders and

regularities as their condition of possibility (Hacking 1982; Daston and Galison 1992; MacKenzie 2008). In my analogy of the cloud chamber, I mean to suggest that the apparatus is fabulatory, it brings into being a community, a people, a science that would not otherwise take place (whilst it simultaneously also tabulates in the classification of clouds and sub-atomic particles). When the apparatus is digital, such as in the design of random forests, the branching points of the algorithm are also fabulations. The bifurcated pathway I envisage, with novelist John Fowles, could always have been otherwise, it can always be queered. "The fork in the path of science, as in literature, is taken with partial knowledge and in the face of profound uncertainty", and so every fork in the path opens onto a potential ethicopolitics (p. 98).

Of course, there is a risk involved in the deployment of ambiguities and juxtapositions as a method for researching machine learning algorithms (Straube, O'Grady, Gilbert). As Straube asks, how much of the technique of "folding in multiplicities of meaning" and "decentering technical terms" (e.g., bias, attribution, stream) "is a deliberate method to draw out meanings and frictions from a notoriously elusive object of inquiry?" Responding to the reviews has been a moment when I am confronted by the methods that I find most productive, and yet rarely reflect upon. To destabilize a concept such as "bias" is also to unsettle ways of thinking. I do seek out feelings of being unsettled, confounded or uncomfortable in my research fieldwork and writing. Becoming unsettled by the use of the concept 'bias' in computer science as a productive practice (in fieldwork) surprised me into revisiting the settled meanings in social science. What work has to be done so that the concept 'bias' means not neutral? What are the hidden dangers and discriminations involved in assuming that an algorithm could be unbiased?

Which brings me to the question – raised across the reviews – of how one relates to the algorithm politically (O'Grady on decision, Thornton on silences, Dwyer on norms). The question extends to the positionality of the social science scholar relating to computer science, so that Straube proposes "the author positions herself as a researcher outside communities of algorithmic practice looking in". Certainly, it is the case that I sought out research sites where I would be confounded by the apertures and opacities, such as the testing of deep learning models for border controls. However, if the writing of algorithms is as opaque to itself (and as experimental and open ended) as writing literature, then communities of algorithmic practice do not have special insight on the technical.[2] Indeed, many of the ideas with which they are now working closely – attribution, clustering, classifier, inference, features – I understand to be deeply engrained in my own training as a social scientist and political theorist. Moreover, when I suggest that we none of us can stand outside of the algorithm in order to adjudicate an encoded ethics, I am encouraging ethical engagement with attributive politics in which we are all enrolled. If algorithms are immanently formed through the relational attributes of selves and others, then the ethicopolitics of algorithms necessarily places each of us inside the problem.

If there can be no outside to the algorithm, then what of the potential for resistance to the actions of algorithms in political and social life? What can a cloud ethics do to resist the forces of algorithms foreclosing political futures? This is certainly the question I am most regularly asked, and the reviewers pose it here in productive and insightful ways (Straube on heuristics, Thornton on the application of cloud ethics; O'Grady on decision; see also McElroy 2021). I argue in the book that there are significant political refusals involved in

[2] The history of computer science is also infused with a "logic of domains" in which domain specific expertise is set against domain agnostic or domain independent forms of knowledge (Ribes, Hoffman, Slota, and Bowker, 2019). Understood in this way, the social sciences are commonly sites of domain knowledge for computer science, as for example in the computer modelling of the Covid-19 pandemic.

claiming the resistant terrain of the unattributable. “As the algorithm presents us with an attributive other who is never singular” (such as in the risk-scored output of the algorithm), each time we must “amplify the unattributable” (p.171). I do envisage an alignment with strategies that refuse the inference of futures on the basis of algorithmic calculation, and that amplify the points of non-closure in machine learning (Bruder 2019; Hoffman 2020).[3] My hope is that resistances to algorithmic governing might be more able to pluralize and multiply when the frame of accountability and transparency is levered open. The opacities and apertures of algorithms will mean that political moments may have no clear path ahead, but it is precisely in these clouded moments that subjugated knowledges and peoples might make their political claims.

[3] The resistant practices I have in mind here are those where the algorithmic harm is located beyond bias or source code, in the inference of futures that deny personhood and potentiality. I describe these in more detail here https://www.theguardian.com/commentisfree/2020/aug/19/ditch-the-algorithm-generation-students-a-levels-politics

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