

Algorithms and the Attributes of Ourselves and Others



# Louise Amoore



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Cover art: James Turrell, *Skyspace Seldom Seen*, 2004. Houghton Hall, King's Lynn, Norfolk, England. Courtesy of Houghton Hall Archives. Photograph by Louise Amoore. For my family, with love & For my students, with thanks for their curiosity This page intentionally left blank

Any true scientific knowing is always, like feeling, only partial. — John Fowles

The possibility of the ethical lies in its impossibility.

- Drucilla Cornell

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The writing of this book coincided with what has felt like the most difficult and dangerous of political times I have experienced. The UK stands on the brink of leaving the community of European peoples that it joined in my first year of life, and far-right political forces are gathering at every turn. So many of the things in the world that I hold dear seem to be under threat: the right of all young people to have an education funded by those who have already benefited in the same way; the obligation on all people and governments to welcome and support those who flee from violence and hardship; the capacity of a democratic society to challenge hate and prejudice; the rights of women, black and ethnic minorities, and LGBTQ+ people to make political claims in the world without risk to their lives and well-being. Following the rising powers of algorithms, as they have begun to dominate economic and political life, my fears for the future are amplified. Let me be clear, machine learning algorithms that anticipate our future propensities are seriously threatening the chances that we have to make possible alternative political futures. In this context, the writing of this book has been challenging for its constant reminder of the limiting of potential political futures. But it has also been intensely uplifting for the incredible generosity of others in encouraging my work. One of the overriding feelings I have as I complete this book is that young people have the full measure of what is at stake ethicopolitically in an age of algorithms. After every lecture I have given, over every discussion in corridors and cafes, I have been struck by the depth and force of the understanding and innovative thought of the next generation of young scholars and students. There is much to be hopeful for, and I dedicate this book to this sense of hopefulness and curiosity.

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Andrew Dwyer, Joe Shaw, and others present in the audience at the Turing Institute, London; Jeroen de Kloet and colleagues at the Amsterdam Centre for Globalisation Studies (and Erna Rijsdijk and Mike Shapiro for asking questions that I can still recall); Nathaniel Tkacz, Celia Lury, and their colleagues at the Warwick Centre for Interdisciplinary Methodologies for discussions of data streams; Huub Dijstelbloem and the University of Amsterdam's Politics of Visualization group; Martin Kornberger, Ann-Christina Lange, and their Copenhagen Business School colleagues working on digital infrastructures; Gunes Tavmen and her colleagues at the University of London, Birkbeck, and the Vasari Institute, for conversations on cloud ethics; Susan Schuppli, Luciana Parisi, Jussi Parrika, and Eyal Weizman, for memorable discussions of the architecture of algorithms; N. Katherine Hayles and all the participants in the Thinking with Algorithms conference in Durham; Jamie Woodward, Maja Zefuss, Noel Castree, Martin Coward, Veronique Pin-Fat, and those in the audience at the Manchester University 125 Years Anniversary lecture. You have no idea how much your generosity has supported my work.

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The writing of this book was funded by the award of a Leverhulme Major Research Fellowship, "Ethics of Algorithms" (2016–2018). I have been extraordinarily fortunate to be afforded the time and resources to do the work that I so wanted to be able to do. It has become much more difficult in the UK to fund the aspects of scholarship that involve reading, thinking, presenting and discussing work, and writing. Thank you, Leverhulme Trust, and may you long continue to act against the grain of prevailing logics of research funds in our times. During my fellowship, two extraordinary women have undertaken my teaching duties: Sarah Hughes and Sydney Calkin. They are a tour de force, and I thank them for everything they have done. Much of the fieldwork research for the book was funded by the Economic and Social Research Council (ESRC) for research on "Securing against Future Events" (2012–16). Throughout the project I worked in collaboration with Volha Piotukh—a postdoctoral researcher of simply astounding talent. Volha, my thanks will always fall short. You simply never gave up—you got us into places for interviews and observations that I would have said were impossible. You asked questions that challenged, exposed, and opened new pathways. You are the human embodiment of a whole new methodology for the social sciences and humanities to engage science. Hanging out with you (long-haul flights, broken trains) has been inspirational.

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# Politics and Ethics in the Age of Algorithms

The mathematical proposition has been given the stamp of incontestability. I.e.: "Dispute about other things; this is immovable—it is a hinge on which your dispute can turn."

-Ludwig Wittgenstein, On Certainty

### "A Hinge on Which Your Dispute Can Turn"

It is March 2016, and I am seated in a London auditorium, the gray curve of the river Thames visible from the windows. A tech start-up business, specializing in developing machine learning algorithms for anomaly detection, is presenting its latest algorithmic innovations to the assembled government and corporate clients. The projection screen displays a "protest monitoring dashboard" as it outputs risk scores of "upcoming threats of civil unrest" in cities around the globe, their names scrolling: Chicago, London, Paris, Cairo, Lahore, Islamabad, Karachi. The score that the analyst reads from the dashboard is the singular output of deep neural network algorithms that have been trained to recognize the attributes of urban public life, the norms and anomalies latent in the data streams extracted from multiple sources, from Twitter and Facebook to government databases. As the presenter explains to the audience of national security, policing, and border officials, "We train our algorithm to understand what a protest is and is not," and "it gets better," "adapting day by day," as it iteratively learns with humans and other algorithms.<sup>1</sup> The process of learning "what a protest is" from the clustered attributes in data and modifying the model continues when the algorithm is later deployed in the city or at the border: "We give you the code," he pledges, "so that you can edit it." How does an algorithm learn to recognize what a protest is? What does it mean to cluster data according to the attributes and propensities of humans to gather in protest or in solidarity? At the London event, as the presenter displays a still



Figure I.1 An image from Stephen Spielberg's film adaptation of Philip K. Dick's novel *Minority Report* appears in a technology company's presentation to government and corporate analysts. Author's photograph.

from *Minority Report* (figure I.1), my thoughts turn to the protests that took place one year earlier, in the US city of Baltimore.

On April 12, 2015, Freddie Gray, a twenty-five-year-old African American man, sustained fatal injuries in the custody of the Baltimore Police Department. The profound violence of Gray's murder is an all-too-familiar event in the racialized architectures of our contemporary cities. During the days that followed his death, however, as people gathered on Baltimore's streets to protest the killing, the violence of the act extended into the plural actions of a set of machine learning algorithms that had been supplied to the Baltimore Police Department and the US Department of Homeland Security by the tech company Geofeedia. With the use of techniques similar to those described in the London protest-monitoring software, the Geofeedia algorithms had been trained on social media data, analyzing the inputs of Twitter, Facebook, You-Tube, Flickr, and Instagram and producing scored output of the incipient propensities of the assembled people protesting Gray's murder. "Several known sovereign citizens have begun to post social media attempting to rally persons to demonstrate," recorded the Baltimore Police Department in a memo that promised to "continue to evaluate threat streams and follow all actionable leads."<sup>2</sup> Indeed, Geofeedia went on to market its algorithms to other states on the basis of a Baltimore "case study" (figure I.2) in which Freddie Gray is said to have "passed away," the city to have "braced itself for imminent protests," and the police to have seized "opportunities" to analyze "increased chatter from high school kids who planned to walk out of class."<sup>3</sup>

During those days in April, terabytes of images, video, audio, text, and biometric and geospatial data from the protests of the people of Baltimore were rendered as inputs to the deep learning algorithms. 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.<sup>4</sup> People were arrested and detained based on the outputs of a series of algorithms that had—as the London scene also proposed—learned how to recognize what a protest is, what a gathering of

Baltimore County Police Department and Geofeedia Partner to Protect the Public During Freddie Gray Riots

#### BACKGROUND

When Freddie Gray passed away in Baltimore on April 25, 2015 from injuries allegedly sustained during his arrest by the City of Baltimore Police, Detective Sergeant Andrew Vaccaro with the Baltimore County Police Department's Criminal Intelligence Unit knew trouble was brewing. With Ferguson's Michael Brown still fresh in the nation's mind and racial tensions running high, Baltimore braced itself for the imminent and expected protests.

Geofeedia

#### OPPORTUNITY

"The Freddie Gray incident was a watershed moment for the City of Baltimore police," Vaccaro said. "The minute his death was announced, we knew we needed to monitor social media data at key locations where protesting was likely, especially at the local police precinct where Gray had been arrested."

In a stroke of luck, the Baltimore County Police Department had renewed their Geofeedia contract a week before the trouble began. The Criminal Intelligence Unit had experienced the too's power first-hand before, and they didn't hesitate to call in reinforcements when trouble arcse.

When an event at Camden Yards on April 25 turned violent, a ten-

perimeters around key locations, set up automated alerts, and forward real-time information directly to Vaccaro's team via email

Figure I.2 Geofeedia's account of the Baltimore protests in the marketing of software analyzing social media data for the detection of incipient public protests. American Civil Liberties Union, 2016.



CASE STUDY: BALTIMORE COUNTY PD

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Politics and Ethics

people in the city might mean. As Simone Browne has argued in her compelling account of the "digital epidermalization" of biometric algorithms, what is at stake is the recognizability of a body as human, as fully political.<sup>5</sup> Among Baltimore's arrests and detentions were forty-nine children, with groups of high school students prevented from boarding buses downtown because the output of the algorithm had adjudicated on the high risk they posed in the crowd.<sup>6</sup> Based on the so-called ground truth of features that the algorithms had learned in the training data, the algorithms clustered the new input data of people and objects in the city, grouping them according to their attributes and generating a numeric scored output.<sup>7</sup>

The profound violence of the killing of one man, and the residue of all the past moments of claims made in his name, and in the name of others before him (note that the names Freddie Gray and Michael Brown persist in the training of subsequent algorithms to arbitrate protest), becomes lodged within the algorithms that will continue to identify other faces, texts, and signs in future crowds. Understood as the principal architecture of what N. Katherine Hayles calls the "computational regime," what matters to the algorithm, and what the algorithm makes matter, is the capacity to generate an actionable output from a set of attributes.<sup>8</sup> What kind of new political claim, not yet registered as claimable, could ever be made if its attributes are recognizable in advance? The very capacity to make a political claim on the future—even to board a bus to make that claim—is effaced by algorithms that condense multiple potential futures to a single output.

At the level of the algorithm, it scarcely matters whether the clustered attributes are used to define the propensities of consumers, voters, DNA sequences, financial borrowers, or people gathering in public space to make a political claim.<sup>9</sup> Thus, when in 2016 Cambridge Analytica deployed its deep learning algorithms to cluster the attributes of voters in the UK EU referendum and the US presidential election, or when Palantir's neural networks supply the targets for the US ICE deportation regime, what is at stake ethicopolitically is not only the predictive power of algorithms to undermine the democratic process, determine the outcomes of elections, decide police deployments, or make financial, employment, or immigration decisions. Of greater significance than these manifest harms, and at the heart of the concerns of this book, algorithms are generating the bounded conditions of what a democracy, a border crossing, a social movement, an election, or a public protest could be in the world.

### Ethics of Algorithms

At first sight, the potential for violent harm precipitated by algorithms that learn to recognize human propensities appears to be a self-evident matter for critique. Surely, one could say, the ethical terrain of the algorithm resides in the broader political landscape of rights and wrongs, good and evil. After all, one could readily identify a set of rights, already apparently registered as belonging to rights-bearing subjects, that has been contravened by algorithms that generate targets, adjudicating which people may peaceably assemble, or which people are worthy of credit or employment, and on what terms. Indeed, on this terrain of delineating the rights and wrongs of algorithmic actions is precisely where many critical voices on the harms of the algorithm have been heard. Writing in the New York Times, for example, Kate Crawford identifies machine learning's "white guy problem," arguing that "we need to be vigilant about how we design and train machine learning systems."10 The dominant critical perspectives on algorithmic decisions have thus argued for removing the "bias" or the "value judgements" of the algorithm, and for regulating harmful and damaging mathematical models.<sup>11</sup> Within each of these critical calls, the ethical problem is thought to dwell in the opacity of the algorithm and in its inscrutability, so that what Frank Pasquale has called the "black box society" is addressed through remedies of transparency and accountability.<sup>12</sup> In sum, the rise of algorithmic power in society has been overwhelmingly understood as a problem of opaque and illegible algorithms infringing or undercutting a precisely legible world of rights belonging to human subjects. In such a framing, there is an outside to the algorithm—an accountable human subject who is the locus of responsibility, the source of a code of conduct with which algorithms must comply. To call for the opening of the black box, for transparency and accountability, then, is to seek to institute arrangements that are good, ethical, and normal, and to prevent the transgression of societal norms by the algorithm.

Yet, when people gathered to protest on Baltimore streets, or when Facebook users' data fueled the political and commercial models of Cambridge Analytica (figure I.3), legible rights to peaceable assembly or to electoral due process were not violated primarily by illegible algorithms. Rather, the means by which people could appear in a political forum, the conditions of their appearance, and the capacities they had to make a recognizable political claim in the world were subject to algorithmic regimes of what Michel Foucault calls truth telling and wrongdoing.<sup>13</sup> In short, what matters is not primarily the identification and regulation of algorithmic wrongs, but more significantly how algo-



Figure I.3 Cambridge Analytica advertises how "data drives all we do" in the fused commercial and political pursuit of ways "to change audience behavior." Screenshot archived by the author in May 2018, when the firm ceased trading under that name.

rithms are implicated in new regimes of verification, new forms of identifying a wrong or of truth telling in the world. Understood in these terms, the algorithm already presents itself as an ethicopolitical arrangement of values, assumptions, and propositions about the world. One does not need to look beyond the algorithm for an outside that is properly political and recognizably of ethics. Indeed, there can be no legible human outside the algorithm and underwriting its conduct, for as John Cheney-Lippold reminds us, we are enmeshed in the data that produce each "freshly minted algorithmic truth."<sup>14</sup> One cannot sustain a search for codes of ethics that instill the good, the lawful, or the normal into the algorithm. Contemporary algorithms are not so much transgressing settled societal norms as establishing new patterns of good and bad, new thresholds of normality and abnormality, against which actions are calibrated.

Actions one might consider harmful, as William Connolly notes, are not merely "actions by immoral agents who freely transgress the moral law" but are "arbitrary cruelty installed in regular institutional arrangements taken to embody the Law, the Good, and the Normal."<sup>15</sup> Amid the widespread search for new ethical arrangements for the scrutiny and regulation of algorithms,

what becomes of the arbitrary harms lodged within embodied algorithmic arrangements? One could imagine a world in which the deep neural networks used in cities like Baltimore are scrutinized and rendered compliant with rules and yet continue to learn to recognize and misrecognize people and to infer intent, to generate rules from the contingent and arbitrary data of many past moments of associative life on the city streets, to refine and edit the code for future uses in unknown future places. I may feel that some notion of legible rights is protected, and yet the attributes generated from my data, in correlation with yours and others', continue to supply the conditions for future arbitrary actions against unknown others. I draw a distinction here between ethics as code, or what Michel Foucault describes as "the code that determines which acts are permitted or forbidden," and ethics as the inescapably political formation of the relation of oneself to oneself and to others.<sup>16</sup> My argument is that there is a need for a certain kind of ethical practice in relation to algorithms, one that does not merely locate the permissions and prohibitions of their use. This different kind of ethical practice begins from the algorithm as always already an ethicopolitical entity by virtue of being immanently formed through the relational attributes of selves and others. My desire for a different mode of critique and ethical account is animated not by the question, How ought the algorithm be arranged for a good society?, but by the question, How are algorithmic arrangements generating ideas of goodness, transgression, and what society ought to be?

In this book I propose a different way of thinking about the ethicopolitics of algorithms. What I call a *cloud ethics* is concerned with the political formation of relations to oneself and to others that is taking place, increasingly, in and through algorithms. My use of the term *cloud* here is not confined to the redefined sovereignties and technologies of a "cloud computing era," as understood by Benjamin Bratton and others, but refers to the apparatus through which cloud data and algorithms gather in new and emergent forms.<sup>17</sup> The *cloud* in my cloud ethics is thus closer to that envisaged by John Durham Peters, for whom clouds are media in the sense that they are "containers of possibility that anchor our existence and make what we are doing possible."<sup>18</sup> To consider algorithms as having ethics in formation is to work with the propensities and possibilities that algorithms embody, pushing the potentials of their arrangements beyond the decisive moment of the output.

A cloud ethics acknowledges that algorithms contain, within their spatial arrangements, multiple potentials for cruelties, surprises, violences, joys, distillations of racism and prejudice, injustices, probabilities, discrimination, and chance. Indeed, many of the features that some would like to excise from the algorithm—bias, assumptions, weights—are routes into opening up their politics. Algorithms come to act in the world precisely in and through the relations of selves to selves, and selves to others, as these relations are manifest in the clusters and attributes of data. To learn from relations of selves and others, the algorithm must already be replete with values, thresholds, assumptions, probability weightings, and bias. In a real sense, an algorithm must necessarily discriminate to have any traction in the world. The very essence of algorithms is that they afford greater degrees of recognition and value to some features of a scene than they do to others. In so doing, algorithms generate themselves as ethicopolitical beings in the world. If to have ethics is not merely to have a code prohibiting, for example, bias or assumptions, but to work on oneself via relations, then the ethicopolitics of algorithms involves investigations of how they learn to recognize and to act, how they extract assumptions from data relations, and how they learn what ought to be from relations with other humans and algorithms.

To be clear, the cloud ethics I propose here 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. To advance a cloud ethics is to engage the ungrounded politics of all forms of ethical relations. The significant new ethical challenges that algorithms seem to present to society actually manifest novel features of some profoundly old problems of the grounds for ethical action. As Judith Butler explains in her Spinoza lectures, the demand to give an account of oneself will always fall short, for "I cannot give an account of myself without accounting for the conditions under which I emerge."19 If one assumes that the determination of an unequivocal I who acts is a necessary precondition of ethics, as Butler cautions, then this identifiable self is "dispossessed" by the condition of its emergence in relation to others. For Butler, this persistent failure to give a clear-sighted account does not mark the limit point of ethics. On the contrary, the opaque and unknowable nature of making all kinds of acting subjects is the condition of possibility of having an ethicopolitical life.<sup>20</sup>

In short, and in contrast to the equation of ethics with transparency and disclosure, ethical responsibility is sustained by conditions of partiality and opacity. My notion of a cloud ethics extends the opacity of the human subject, envisaging a plurality of venues for ethical responsibility in which all selves—human and algorithmic—proceed from their illegibility. The apparent opacity and illegibility of the algorithm should not pose an entirely new problem for human ethics, for the difficulty of locating clear-sighted action was already present. The *I* who forms the ethical relation was always in question and

is now, with algorithms, in question in new ways. Though the mathematical propositions of algorithms cannot be made fully legible, or rendered accountable, they can be called to give accounts of the conditions of their emergence. These conditions include some relations that are identifiably between humans and algorithms—such as the selection and labeling of training data, the setting of target outputs, or the editing of code "in the wild," for example—but others still are relations of algorithms to another algorithm, such as a classifier supplying the training data from which a neural network will learn. In all such instances of iterative learning, the significant point is that the conditions of an algorithm's emergence—a composite of human-algorithm relations—are venues for ethicopolitics.

In a discussion on the impossibility of the transparent algorithm, the brilliant and generous scholar of black studies and machine learning Ramon Amaro once said, "Well what would it be if we even could open it? It's just math."21 Of course, he intended the comment as a provocation, but mathematics is never only "just math," as Amaro's work vividly shows. To reflect on the conditions of an algorithm's emergence is also to consider how, as mathematical knowledge forms, algorithms have achieved the status of objective certainty and definiteness in an uncertain world.<sup>22</sup> Ludwig Wittgenstein observed mathematical propositions to be "given the stamp of incontestability," a mark of the "incontrovertible" and an "exemption from doubt" that other propositions, such as "I am called," are not afforded.<sup>23</sup> For Wittgenstein, mathematics as practice-like all other language games-is concerned with particular uses of propositions, where "what a proposition is, is in one sense determined by the rules of sentence formation, and in another sense by the use of the sign in the language game."24 His concern is that the mathematical proposition has achieved a particular status of certainty in an otherwise uncertain world, so that it becomes "a hinge on which your dispute can turn."<sup>25</sup> For Wittgenstein, the mathematical proposition should be regarded as no less doubtful or uncertain than the "empirical propositions" otherwise made about the world. Indeed, Wittgenstein's point is to address mathematical propositions as empirical actions that are "in no way different from the actions of the rest of our lives, and are in the same degree liable to forgetfulness, oversight and illusion."26 Following Wittgenstein, the use of mathematical propositions is profoundly social and, in my reading, ethicopolitical. An algorithm is formulated through a series of truth claims about its match to the world, and yet, in its use in the world it is as prone to forgetfulness, oversight, misrecognition, and illusion as any other language game.

Algorithms such as those used to detect latent social unrest in the city