



Charlesworth, A. J. (2021). Regulating Algorithmic Assemblages: Looking Beyond Corporatist AI Ethics. In U. Kohl, & J. Eisler (Eds.), *Data-Driven Personalisation in Markets, Politics and Law* (pp. 243 - 262). Cambridge University Press.
<https://doi.org/10.1017/9781108891325.019>

Peer reviewed version

Link to published version (if available):
[10.1017/9781108891325.019](https://doi.org/10.1017/9781108891325.019)

[Link to publication record on the Bristol Research Portal](#)
PDF-document

This is the accepted author manuscript (AAM). The final published version (version of record) is available online via Cambridge University Press at <https://doi.org/10.1017/9781108891325.019>. Please refer to any applicable terms of use of the publisher.

University of Bristol – Bristol Research Portal

General rights

This document is made available in accordance with publisher policies. Please cite only the published version using the reference above. Full terms of use are available:
<http://www.bristol.ac.uk/red/research-policy/pure/user-guides/brp-terms/>

Regulating Algorithmic Assemblages: Looking Beyond Corporatist AI Ethics

Andrew Charlesworth

1. Introduction

The perceived potential of artificial intelligence (AI) systems, broadly characterised, has seen a massive surge of investment in research and development, and their penetration into many decision-making processes of commercial, political and public organisations.¹ The driver behind this surge and the improvements in AI technologies in recent years, especially in the field of machine learning, has been the development of vast digital data sets.² These data sets can be harnessed as training data to improve the AI system's ability to identify potentially significant correlations, which in turn can provide highly insightful intelligence on animate activity (e.g. human behaviour) or inanimate processes (e.g. weather patterns). Of course, large data sets (and actuarial assessments) existed long before the advent of digitisation, notably central and local government datasets (e.g. taxes, welfare), policing datasets (e.g. criminal records, fingerprints, photos), medical datasets (e.g. patient records, clinical trial data, surveys), and corporate credit datasets. Yet, what is new is their deep penetration into most spheres of private and public life. From shopping, entertainment, policing and fraud detection, to political campaigning, credit scoring, insurance quotes, social networking and news consumption, AI systems ubiquitously work behind the scenes to infuse decision-making processes with intelligence extracted from big data. In many of these contexts, this intelligence is used to develop highly personalised predictions or targeted services.

These automated decision-making processes have attracted public and regulatory attention, partly because of their sheer pervasiveness, and partly because the steady exposure to machine generated outcomes has also made abundantly clear that the processes are no more neutral or objective than human judgements, but have values embedded within them. This in turn suggests that these systems ought to be subjected – in the name of transparency and accountability - to some regulatory oversight,³ much like their analogue counterparts. Those employing AI ought not to be able to hide behind the machine and avoid being answerable for unlawful biases, damaging errors of assessment, or 'redlining' and discrimination against individuals and communities. Although such negative effects are usually the result of a failure in AI system design or flawed training datasets, some observers have suggested that certain AI-supported processes in government decision-making may have been quite deliberately designed to have exclusionary effects.⁴

At the same time, it has also become apparent that, even accepting that the personalisation phenomenon can provide notable efficiencies and economic gains in delivering services (e.g. precision medicine), or allocating scarce state resources (e.g. predictive policing), it is also often accompanied by unintended negative effects,⁵ that should attract public debate. For example, highly personalised insurance or credit score systems apply a heightened user-pay logic to the

provision of their services, which is beneficial to privileged customers, but also liable to amplify existing social disadvantages, and implicitly undermine notions of distributive justice and communal solidarity. Equally, personalised news and entertainment consumption and attendant ‘filter bubble’ effect cannot but undermine social cohesion.⁶ Whilst media and academic accounts have focussed on the potential negative impacts on individuals or categories of individuals, there has been much less consideration of broader consequences or ripple effects of incorporating AI into existing social systems.⁷ For example, although systems such as automated facial recognition technology or predictive policing promise more accurate and efficient policing (although this is far from empirically proven), they also have unintended negative side effects. They divert limited public resources away from existing operational methods, such as community policing, that are demonstrably effective at achieving policing objectives, but which are human resource intensive, and difficult to subject to audit and metric oversight. While greater recourse to such systems may generate revenue and data for the private sector, and produce auditable metrics for government, this will inevitably further isolate police officers and staff from direct engagement with the broader communities they serve, and whose co-operation they need.

This chapter explores these consequences and ripple effects through an ‘AI ethics’ perspective, which has become the dominant overarching discourse concerned with ‘regulating’ AI for the good of society. Yet, as the phrase suggests, ‘AI ethics’ is far removed from ‘AI law’ and broadly captures the idea of self-policing by private corporate actors in their use of AI systems, as sanctioned by government. The discussion here critiques that self-policing, first, by locating AI ethics within long-standing traditions of corporate social responsibility and institutional ethical frameworks with all their in-built shortcomings, that frequently translate into a systemic inability to be truly Other-regarding. Second, this chapter shows, with reference to the recent EU AI ethics initiative, that even well-intentioned initiatives may shoot past their target by simply assuming the desirability of AI applications, regardless of their wider impacts. Such an approach restricts itself to tinkering with system details whose consequences are relatively minor in comparison to the much broader impacts of AI within social systems, as captured by the idea of ‘algorithmic assemblage’. Only a holistic analysis that goes beyond a focus on individual and group rights would be able to even engage with these broader impacts, but this is hardly likely to occur if AI ethics is constructed - as is currently the case - as an essentially corporate concern. For corporations, these wider effects of AI on society are frequently the direct *and* intended result of pursuing the bottom line.

2. A New Ethical Dawn or the Art of ‘Ethics-washing’

2.1 A Burgeoning Ethic Industry

This public disquiet has not gone unnoticed by government, commercial entities and researchers seeking to develop or implement AI-supported personalisation. The European Commission explicitly included in its strategy for AI development ‘ensuring an appropriate ethical and legal framework based on the Union's values and in line with the Charter of Fundamental Rights of the EU.’⁸ Likewise, the UK Government’s Office for Artificial Intelligence states, in its policy paper, *The AI Sector Deal* (2018), as a policy objective of its AI strategy ‘leading the world in the safe and ethical use of data through a new Centre for Data Ethics and Innovation...’,⁹ Google created, and then disbanded, an AI ethics council,¹⁰ Microsoft has launched an AI ethics framework, and a

range of companies including Facebook, Amazon, IBM, and Salesforce are hiring ethicists to work on their AI strategies or funding AI initiatives.¹¹

However, the developing interest in AI ethics in government and business, while on its face a positive reaction to public criticisms and fears, brings problems and concerns of its own. The establishment of ethics boards, ethics oversight committees and codes of practice for AI by corporate entities follows a familiar regulatory pattern, well established in the technology sphere, whereby industries seek to head off formal governmental regulatory intervention by providing putatively self-regulatory mechanisms to address the problematic impacts of their services or corporate activities. These are usually premised on subsidiarity arguments, and there is some evidence that they can be an effective means of achieving positive regulatory outcomes in specific circumstances.¹² However, self-regulatory regimes are often criticized in regulatory literature for failing to adequately protect public interests when these conflict with commercial imperatives, for a lack of transparency and meaningful accountability, and for failing to engage in effective dialogue with civil society (a lack of tripartism).¹³

Of course, corporate embrace of ethical frameworks for AI is not necessarily a cynical attempt to avoid regulation by means of ‘ethics-washing.’ It may reflect genuine attempts to transfer values that contemporary public discourse (e.g. in the media) suggests are held or are likely to be considered desirable by primary stakeholders into a frame which corporations can more easily internalise. For example, transformation of those values into mechanisms for legitimatising particular technology practices or business opportunities and thereby stabilising them. Personalised marketing would appear to be a prime example. This may open up a range of opportunities, from reconsideration of outdated corporate routine, to development of formal internal or industry codes of conduct, establishment of industry networks, and wider stakeholder engagement. That said, those outcomes will not necessarily result in positive or effective approaches to resolution of social problems caused by AI. Much depends upon whether this approach to public values is truly institutionally assimilative or just deflective.¹⁴

2.2. CSR Reinvented?

Analysis of corporate moves to establish internal or industry-wide external AI ethics frameworks thus inevitably suggests parallels from the wider debate over the development and effectiveness of Corporate Social Responsibility (CSR). While CSR, in the broad sense of ‘clearly articulated and communicated policies and practices of corporations that reflect business responsibility for some of the wider societal good,’¹⁵ has become a globally recognised concept, its roots lie firmly in the US. Commentators have noted distinct differences between US and European approaches to CSR suggesting that US CSR reflects a clearer explicit role for corporations in taking independent responsibility for societal interests, whilst European CSR implicitly envisages a ‘partnership of representative social and economic actors led by government.’¹⁶

Given that corporate AI powerhouses are primarily of US origin, it is unsurprising that the initial response to concerns about the ethical implications of AI was premised on corporations developing solutions either through internal debate and procedures, or via trusted ‘outsiders.’ This meant that the AI ethics debate was ‘Americanised’ at an early stage, and a US corporate responsibility approach to AI ethics strongly underpins national and supranational policy developments. Thus, when the EU High-Level Expert Group on Artificial Intelligence was

established by the European Commission in 2018, to make recommendations on ethical, legal and societal issues related to AI, the ethical discourse that it would engage in had already largely been framed. That framing embedded a corporate-centric perspective of potential ethical risks and the means to ameliorate them as the central focus of the dialogue.

Criticisms of the effectiveness of CSR in achieving long term societal goods are long standing.¹⁷ A key concern is that even where CSR practices are, or purport to be, beneficial for primary stakeholders, they fail to address issues of wider social importance – in other words that, in practice, most CSR initiatives are in fact ‘direct influence tactics.’¹⁸ An example of this in the AI domain can be seen in Google’s recent attempts to address its employees’ concerns about the direction of its AI R&D, and in particular its relationship with the US military.¹⁹ Google made a point of publicly distancing itself from controversial contracts, creating a set of AI Principles and establishing an AI ethics committee, which was disbanded after further employee protests about its proposed membership. These actions clearly sought to address the ethical concerns of a primary stakeholder group (its employees) relating to its corporate practices. However, Google continues to provide financial, technological, and engineering support to a range of start-ups that provide AI technology to military and law enforcement through a venture capital arm.²⁰ Thus the impact of the apparently ‘responsible’ actions is diminished, and the ethical considerations avoided rather than addressed. Indeed, placing ethically problematic R&D at one or more removes from Google, in a range of smaller, ostensibly independent, start up companies is likely to make it harder to ensure that commercial practices that might breach, or come into conflict with, socially desirable ethical principles can be identified, subjected to critical scrutiny and appropriately regulated.

2.3. Structural Weaknesses of Corporate Self-Regulation

The problematics inherent in establishing when it is appropriate for government to permit corporate self-regulation combined with the criticisms of US CSR approaches (not least the difficulties in establishing the extent to which those approaches can plausibly be expected to identify, select and prioritise solutions that address wider social problems over those affecting primary stakeholders) also raises questions about the consultation process upon which guidance for national and supranational policymakers rests.

A critical assessment of the governmental/corporate approach to developing ethical AI should thus consider the extent to which bodies writing AI ethics guidelines on behalf of government, or ethics boards established by corporations to advise on policy, are truly independent and transparent.²¹ For example, in the case of EU High-Level Expert Group on Artificial Intelligence, what percentage of its 52 members were employed by corporate entities or interest groups, or been funded by them? The Expert Group’s report *Ethics Guidelines for Trustworthy AI* (2019) (*Ethics Guidelines*)²² is silent on potential conflicts of interest amongst its members – an obvious ethical oversight. Similar problems can be found with corporate AI ethics boards: companies may refuse to divulge membership, identify who participates in meetings and discussions, reveal how rules and policies have been determined, and what action has been taken, if any, as a result of ethics board suggestions.²³

This also implicates issues of accountability. If companies get to self-determine the parameters of the ethical landscape via their own ethical boards and through undeclared influence on the

outcome of ‘independent’ governmental evaluations, key questions may simply never be adequately debated. Discussion can be framed in ways that fail to raise, or which marginalise, issues that are not readily amenable to the solutions that are acceptable to corporations, that is solutions that place minimal regulatory constraints on their activities, or are of particular importance to their primary stakeholders.. Reducing ethical investigation to checklists, or limiting consideration of the social impact of AI-supported personalisation to questions about whether individual rights, or the rights of particular groups, are disproportionately impacted ignores issues that may not be readily addressed by checklists and that are of wider societal concern, and may range beyond the activities of an individual company or industry.

The self-regulatory approach that the use of ethics boards offers is one of weak accountability even for those issues that are addressed. Simply establishing an ethics board provides no guarantee of ethical behaviour without a clearly defined and transparent framework that sets out how the ethics board will operate, who its members are, how its recommendations should be acted upon by the company, and who is accountable, and how, if they are not. Similarly, a code of practice is of limited value without any publicly accessible evidence of what consequences of breaches there will be. Without these types of accountability mechanisms, ethics boards are likely to be simply a regulatory ‘Potemkin Village’ designed to deflect public concern and state regulation, but with little meaningful impact on corporate practices.

There is also an issue of the degree to which small groups of ethicists and experts drawn from a narrow range of disciplines or interest groups can adequately represent the broad concerns of wider civil society. Where the same individuals are also members of more than one ethics board or expert group – there is also an increased risk of ‘groupthink’²⁴ that may lead to failure to access and exchange context-specific information, unwillingness to explore viewpoints or courses of action suggested by others outside the group, and as a result, the adoption of inadequate, incomplete or inflexible outputs.²⁵ A notable feature of much of the corporate-sponsored and governmental ethical debate about AI-supported personalisation has been its distance from both the general public and civil society groups. The High-Level Expert Group on Artificial Intelligence notes that ‘Over the past months, the 52 of us met, discussed and interacted...’; yet a survey of its members listed suggests a very narrow range of discussants, dominated by corporate representatives and AI researchers from a select number of academic disciplines, notably computer science, law, philosophy and ethics.²⁶ A review of the literature cited in the *Ethics Guidelines* includes theoretical ethical material developed by members of the Group, and links to EU projects using or seeking to develop AI-based solutions to a range of social issues, but contains no citations to empirical work on the social impacts of AI, or to wider civil society critiques of impacts of new technologies. The document identifies that a key nontechnical method to secure and maintain Trustworthy AI is ‘open discussion and the involvement of social partners and stakeholders, including the general public’ and notes that ‘[m]any organisations already rely on stakeholder panels to discuss the use of AI systems and data analytics ... includ[ing] various members, such as legal experts, technical experts, ethicists, consumer representatives and workers.’²⁷ Yet the Group’s pilot Assessment List appears to have been compiled without significant direct or indirect public input.²⁸

The above concerns should not be taken as a criticism of specific individuals but should cause us to reflect upon the conscious or unconscious biases, preferences or concurrence seeking that

drafting ethical guidelines under those conditions may encourage. A perceived problem of personalisation on the internet is the filter bubble, that is 'an environment ... in which people are exposed only to opinions and information that conform to their existing beliefs.'²⁹ In practice, filter bubbles of one sort or another have always existed, indeed, there are clear similarities with the concept of 'groupthink' mentioned above. Expert groups are no less prone to this problem than internet users. Indeed, as anyone who has been involved in drafting ethical frameworks, codes of practice or standards can attest, it is often relatively unproblematic to devise these in committee, particularly when the members of the committee share a common objective and similar backgrounds, but quite another to persuade others to apply them in practice in circumstances where there are divergent social, cultural or business attitudes.³⁰ Rules that look good to the committee on paper may not be assimilated without resistance into practices or applied to end-use cases. As the following section suggests, even with some degree of regulatory compulsion they may not lead to effective transparency, oversight, audit and accountability.

2.4. Ethics Institutionalised

As Chair of an academic Research Ethics Review Committee, one obtains an interesting perspective into the way in which researchers in UK Higher Education interact with both the ethical guidelines pertaining to their discipline, and the procedural requirements created to give effect to those guidelines. There is often a perceptible disjoint between the 'understood' ethical principles and guidelines, and the actual willingness of researchers to act, or refrain from acting, in ways that ensure that those principles and guidelines are respected, and seen to be respected, in practice.

Researchers chafe at the 'red-tape', the 'administrative burden', the 'restriction on academic freedom' and the 'methodological constraints' of ethical oversight.³¹ They cut and paste past responses to ethics review questions without considering the particular variables and risks of their proposed research, provide minimalist responses to questions about risks to research subjects and their data, and leave ethics review applications until the last moment before grant applications are to be submitted, or time sensitive fieldwork begun. Their information for research subjects is written in impenetrable technical jargon, their consent forms are vague and confusing, and their risk assessments cursory. Then, when the research begins, how many of those gestures to ethical practice promised in ethics applications fall by the wayside when time is short? What ethical corners are cut when a 'research opportunity' is too good to miss? What are the perceived and actual consequences for individual or institution, if any, of breaches of ethical guidelines?

Equally, academic ethical review processes often leave something to be desired. Criticisms of ethical review encompass box-ticking exercises, institutional back-covering, excessive formality, lack of reflexivity, and imposition of inappropriate discipline-specific requirements.³² Often a primary institutional motivation for incorporating processes of ethical review of research across all academic disciplines is not a concern for the fair treatment of research subjects, as individuals or a group; for the welfare of researchers; or for the avoidance of possible negative impacts on wider society. Rather it is concerned with ensuring continued access to grants and avoiding embarrassing legal action or poor publicity,³³ or put another way, the need to pay attention to primary stakeholders. From that perspective, there are greater similarities between the

objectives of such institutional research ethics policies and CSR policies in the wider commercial sector than might be anticipated. This ‘institutional protection’ may also perhaps be reflected in the nature of ethical oversight in academia – there is usually significant front-end oversight by committees responsible for ethical review (although the nature and scope of that review may vary significantly between disciplines) at various levels of the institution. For some types of research, notably biomedical research, there may be formal oversight by external bodies,³⁴ but outside specific discipline domains, formal audit is unlikely except in cases of egregious breaches of guidelines. There are numerous, often interlinked, reasons for this - lack of resource, lack of authority, lack of access and lack of will. Reliance is often placed on self-reporting of ethical breaches, reporting by those managing the researcher, or reporting by third parties, including research subjects, to ensure ongoing oversight.

It is suggested that the production of academic ethical standards and processes have, in conjunction with general legal requirements such as data protection law, produced a research environment where academics who deal with human research subjects are broadly cognizant of the general ethical principles applied to their research, even if they are sometimes rather hazy on the detail. However, in practice, those principles are often, consciously or sub-consciously, viewed as ‘ethics for others’, as researchers perceive that their own practices are somehow innately ethical, that any deviation by them from those principles is likely to be minor and excusable in the circumstances, and that it is other researchers that are more likely to significantly deviate from those principles and are thus more deserving of scrutiny than them. It is this perception that underlies at least some of the ‘chafing’ about the imposition of formal oversight.

A key question is then whether ethics guidelines and ethical review processes have resulted in better ethical practices in academic research, or simply led to the development of a carefully cultivated façade of ethical practice that suggests the existence of an effective and reflexive process of consideration and mitigation of individual, group and social risks that it cannot meaningfully deliver? Consideration of the outcome of that microcosmic assessment might provide a starting point from which to begin to understand the nature of the difficulties likely to arise when seeking to apply a general ethical framework to a phenomenon as potentially ubiquitous as the use of artificial intelligence in decision-making processes. If it is difficult to inculcate and embed effective ethical practice in a community of researchers which has produced numerous codes of ethical practice for research,³⁵ which supports several journals dedicated specifically to research ethics;³⁶ and which is subject to formal institutional, funder and increasingly, publisher, ethical review requirements; then one would have to seriously question the likely effectiveness of ethical guidelines alone in contexts with significant countervailing forces, such as governance and commerce.

3. AI Ethics Guidelines Deconstructed

3.1. Limited Tool Box: Those who cannot remember the past are condemned to repeat it

It has often been said of army commanders that they tend to spend peace time studying how to fight the last war rather than strategizing for the next one. Yet reacting to new problems by resorting to methods one used to address previous problems, even if the outcomes of those

methods are less than optimal, is hardly confined to the realm of the military. One of the critical concerns relating to AI-supported personalisation is that of privacy, whether related to governmental surveillance and predictive profiling, or corporate profiling and manipulation of individuals and groups. Privacy and data protection have been key issues in the relationships between citizen vis-à-vis State and consumer vis-à-vis the private sector for over 60 years. It seems fair to suggest that, to date, existing regulatory strategies to protect privacy and personal data have struggled to prevent their erosion by technology even in those States which have constitutionally protected privacy rights and comprehensive data privacy laws. Equally, suggestions that technology (e.g. privacy enhancing technologies) might be harnessed to either support or replace non-technological methods have not gained widespread traction in the private sector - to adapt a popular saying, it appears that the best way to make a small fortune investing in privacy enhancing technologies is to start off with a large fortune.

With this in mind, it is instructive to look at the *Ethics Guidelines*. The technical measures it promotes are: ³⁷ setting up processes for embedding ethical rules within AI system architecture (ethics by design), and secondary systems to monitor how compliant the primary systems apply those rules (Trustworthy AI); establishing methods that explain system behaviour to assess their reliability and to inform 'users' (explicability of output); testing and validating an AI system across its life cycle (oversight); and developing quality of service indicators to ensure a baseline that an AI system has been tested and developed with security and safety considerations in mind. These are laudable objectives and have been suggested in some form or another, from a privacy-enhancing perspective, for many of the same AI systems. Indeed, the ethics-by-design suggestion is directly drawn from the GDPR and the data privacy research and practice upon which it rests. However, the real-world implementation of such technical measures in the privacy arena suggests at best a weak level of adoption and, even where adopted, the practical results often appear significantly attenuated from those suggested by regulators and theorists.

These technical measures are then followed by recommendations of non-technical measures including: *regulation* with references made to product safety legislation and liability frameworks; *soft law and co-regulatory approaches* with organisations signing up to the Guidelines, Codes of conduct, 'accreditation systems, professional codes of ethics or standards for fundamental rights compliant design' or certification regimes run by trusted intermediaries; *internal governance frameworks*, for example, by setting up ethics boards;³⁸ fostering *education* and awareness in all stakeholders including the general public, for example, by using stakeholder panels and engaging in social dialogue; as well as ensuring *diversity and inclusivity* amongst AI makers and users, i.e. amongst those who 'design, develop, test and maintain, deploy and procure these systems.'³⁹

The idea that ethical AI can be promoted with the backing of product safety legislation and liability frameworks is interesting from a UK perspective, if only because of the limited application of both those regimes to computer software, and the degree of effort the software industry has, over the years, put into ensuring that this remains so.⁴⁰ Beyond this, most of these measures have also been mooted or utilised as part of the data privacy regulatory toolkit. With the arguable exception of data privacy legislation, most of these measures, while laudable in principle, have been of limited effectiveness in the data privacy sphere, and it is unclear why the *Guidelines*

assume that they will be any more effective in creating ‘Trustworthy AI’ rather than simply producing (as we see with contemporary data privacy) a secondary industry ecosystem of consultants, certification bodies, e-training specialists and administrators, of varying quality, reliability and longevity.

Diversity and inclusivity from design to procurement and deployment is also, in principle, desirable, particularly considering that the technology industry has traditionally scored poorly on both counts, whether in terms of technology workers or organizational leadership. Yet, even if diversity and inclusivity can be increased, it is worth noting that the design side of the technology is often at a significant remove from the procurement and deployment of systems. A key element missing from the list is the ‘selling’ - what are the features upon which AI marketing rests, do purchasers understand the ethical implications of its use in particular contexts, and do the vendors themselves understand, and seek to communicate the purchasers, the ethical issues that might arise from the use of their products? One can have an inclusive and diverse design, developer, testing and maintenance team which produces an ethical AI system, but still have it marketed, implemented and directed in ways that are problematic. The ‘diversity and inclusivity’ concerns are well illustrated by various manifestations of data-driven personalisation which, as shown in this collection, tends to reinforce existing socio-economic inequalities and vulnerabilities, few of which AI makers or their governmental or corporate users share or are particularly preoccupied with. Indeed, their personal or institutional interests are often directly benefited by ethically questionable personalised applications, that come in the form of cheaper prices or credit (price or credit discrimination), greater public safety (predictive policing or sentencing) or smaller public health budgets (precision medicine) – regardless of its crippling consequences for the already disadvantaged, as discussed in a number of chapters of this book.

3.2. Limited Perspectives on Affected Interests: An Atomistic Approach

Much of the language of the *Ethics Guidelines* is couched in terms of fundamental rights and freedoms that are directed towards the individual or to particular groups of individuals who are perceived to be at risk because of particular characteristics or vulnerabilities. AI-facilitated personalisation will undoubtedly impact individual and group rights, and the *Ethics Guidelines* provide a lengthy, if sometimes mechanistic, *Assessment List* to aid consideration of the issues. Yet it pays little attention to the structural/societal impact of AI-facilitated personalisation. While the report makes gestures towards wider social issues,⁴¹ only one of the 131 questions in the *Assessment List* is addressed to ‘Society and Democracy’ by alerting to the possibility of affected stakeholder interests over and beyond the end user.⁴² This largely atomistic approach ignores the potential impacts of AI and personalisation on the wider community, preferring instead to concentrate on a series of discrete individual or group rights that can be neatly categorised, risk assessed and check boxed.

Several problems with this line of approach are identified by Hoffman.⁴³ The emphasis on avoiding breaches of legally protected individual or group rights tends to direct attention to the perceived need to avoid ‘bad actors’, that is, seeking to ensure that individuals or organisations do not deliberately or inadvertently embed discriminatory or damaging biases into AI. Alternatively, given the ‘black box’ nature of many AI systems, there is a growing tendency to shift the blame for unexpected or unpredictable outcomes from ‘bad actors’ to ‘bad algorithms’,

that is their model or training data. Solutions to these issues might typically be sought in enhancing diversity and inclusivity in human teams across the AI lifecycle, or by ‘technical ‘patches’. However, such fixes for individual or system behaviour inevitably displace more systematic attempts to explore and address the wider social and cultural processes and practices underlying the particular forms of discrimination that made them necessary in the first place.⁴⁴

There tends also to be a focus on overcoming specific disadvantages faced by (legally) pre-categorised and often artificially homogenised groups without a clear understanding of how institutional or social contexts may affect the impact of a particular instance of AI decision making on sub-groupings within and across those groups. Viewing AI decision-making solely from the perspective of avoiding building in specific types of disadvantage may result in a ‘fair AI’ in terms of avoiding obvious disparity between treatment of different groups by the AI. However, this approach is unlikely to call into question the discriminatory effect of any systemic advantages enjoyed by particular groups, whether these advantages are internal or external to the AI system. For example, an AI decision may have real world consequences, the outcomes of which are entirely contingent upon external factors, such as wealth or social capital.⁴⁵ As Eubanks puts it:

‘We all inhabit this new regime of digital data, but we don’t all experience it in the same way. What made my family’s experience [dealing with a negative AI decision] enduring was the access to information, discretionary time and self-determination that professional middle-class people take for granted.’⁴⁶

Neglecting to take a holistic view of potential structural inequalities, such as these, means that the unfairness of the AI outcomes tends to go unchallenged and unaddressed.

The legal and political debates around fair treatment and anti-discrimination also tend to home in on the distribution of rights, opportunities and resources. Hoffman argues that this is problematic on two grounds.⁴⁷ First, that distribution of rights, opportunities, and resources is in itself demonstrably insufficient to afford human dignity if such distribution is not simultaneously supported by changes in social structures and attitudes which prevent harms that do not lend themselves to effective remedy by distributive means. Second, making the central issue one of distribution of rights, opportunities and resources is to suggest that AI can be isolated from the wider social systems within which they are incorporated when in fact they are intrinsic to the ongoing production of social and cultural meaning within those systems (see below).

The ‘atomistic’ approach thus reveals a core difficulty for authors of the *Ethics Guidelines*. On the one hand they are tasked with considering the ethical issues arising from AI; on the other they aim to provide the *Assessment List* to aid organisations to incorporate ethical thinking into their processes and procedures. The former objective might reasonably be assumed to include a holistic assessment of the types of broad social issues and risks arising from AI beyond individual and groups rights. It might raise questions about whether use of AI-facilitated personalisation might drive undesirable social developments. For example, the potential for the concentration of power in the hands of those designing or controlling the design of the technology (we can already see how control of the use of personalisation has begun to affect the distribution of wealth [see Chapter by Nick]; the dismantling of systems based on communal solidarity or distributive justice, such as insurance; the further obstruction of social mobility, already in decline; or the erosion of social cohesion, driven by the expansion of ‘filter bubbles’ across all

forms of technology-mediated communication. In contrast, the second objective demands an approach that eschews macro-policy considerations in favour of micro-risk assessment focusing narrowly on rights of individuals or groups of individuals. The risk with the latter approach is that it suggests that the broader social questions are outwith the responsibility, concern or capacity of individual organisations or industries.

If that is the case, then it is even more problematic if governments, encouraged by the prime corporate movers, leave the legal and ethical regulation of AI to self-regulatory processes. In those circumstances the debate is likely to become one of how to implement business friendly, individual rights-focused, risk assessment-based regulation, and not one that actually engages with civil society representatives to develop an understanding of the limits of the social, economic and political trade-offs citizens might be willing to accept in return for the potential advantages that AI and personalisation might bring.⁴⁸ Major societal trade-offs obscured in a narrow debate premised on the desirability of personalised consumption from access to credit to medical services [see Keith's Chapter] are the values of communal solidarity or a recognition of structural disadvantages that makes this intensified 'user-pay' approach fundamentally problematic and at odds with concerns of redistributive justice. Equally, if one starts from an acceptance of personalised news consumption, the societal values of democratic debates across classes, cultures, generations are inevitably marginalised. Finally, in law, starting from an assumption of the legitimacy of predictive sentencing on the basis of its public safety benefits, obscures how those benefits can only come on the back of compromised fundamental values such as the presumption of innocence or just desert [see David's Chapter]

3.3. Limited Problematisation of 'Algorithmic Assemblages'

Finally, a striking omission from the *Ethics Guidelines* is any sustained attempt at reconsidering or challenging the predominant framing of the potential ethical risks and the strategies to address them. Recent literature in the Science and Technology Studies field argues that the majority of the discussion in this area to date has focused on relatively narrow and technical understandings of the effects and impacts of algorithms, and that it will be necessary to attempt a more holistic approach to framing if meaningful intervention to achieve broad social objectives such as fairness, justice, and due process is to be achieved.⁴⁹

Key to this argument is understanding that AI algorithms are not inherently free of values but have sociological and normative features which in their interactions with humans 'makes some associations, similarities, and actions more likely than others.'⁵⁰ They become useful or reliable only by virtue of their interaction with data, end users or other systems, and in interacting are engaging in both technological and social functions 'structuring how information is produced, surfaced, made sense of, seen as legitimate, and ascribed public significance.'⁵¹ The difficulty in creating guidelines for the ethical use of algorithms thus lies partly in the fact that such guidelines are not applying ethical values to a blank slate, but attempting to change values already embedded within particular algorithmic instances, and partly in the fact that ethical guidelines directed at affecting the behaviour of an organisation, or even an industry, are unlikely to be helpful when the need is to address the effect of 'algorithmic assemblages' that may span broad socio-technical networks:

The efficacy of an algorithmic assemblage consists not only in its ability to process and identify patterns in vast amounts of data but also in its ability to manipulate adjacent computational routines, material infrastructures, and human beings. Depending on its domain of application, assembling a functioning algorithm requires the integration not only of hardware and digital flows but also of the organizational structures, analog infrastructure, and socioeconomic processes from which it draws its problems and on which it operates.⁵²

The dominant framing of the AI ethics debate to date has adopted a US corporate-centric perspective of the potential ethical risks and the means to be taken to ameliorate them. This reflects a limited CSR-style approach to developing ethical guidelines, which focuses on the concerns of primary stakeholders, and takes an instrumental approach heavily premised on existing legally defined and narrow commitments to the protection of individual and group rights. This narrow framing of the ethics debate is unlikely to provide an effective basis for future ethical approaches to AI generally, and ‘algorithmic assemblages’ in particular. What is required is a clear understanding of how AI become incorporated into social processes, and the effect they have, and could have, on broader social developments. It is difficult to see how a pathway to such an understanding can be created if one begins from a starting point premised upon the social, political and economic presumptions and preconceptions baked into the CSR approach.

A fundamental rethink of the way that policymakers approach the problematic of AI and ‘algorithmic assemblages’ is needed. Recourse to ethical frameworks and regulatory models that do not attempt from the start to engage with the actual and potential structural inequalities that AI and ‘algorithmic assemblages’ retain, reinforce and reify is inevitably going to be a case of tackling symptoms and not causes. Consider, for example, Amazon’s market dominance based on its first mover position on personalised recommender system is now deeply embedded within and enhanced by an intricate assemblage of algorithms extending far beyond analysing shopping habits to the analysing and optimising workers, suppliers and competitors:

‘The logistical algorithms at the core of an Amazon shipping center not only make predictions based on the analysis of past transactions, shipping events, and worker performance but also use those predictions to actively manage product inventories, control the position and performance of human workers, govern the flow of packages through the physical space of the warehouse, and interact with external organizations such as FedEx or the postal service.’⁵³

This assemblage would already stretch the effective applicability of the *Ethics Guidelines’* Assessment List, and it is only a fragment of a far wider Amazon-centred social and economic ‘ecosystem’. That ecosystem extends far beyond the boundaries of what Amazon.com, Inc. owns, or can exercise some degree of control over, even should it wish to, and is continually evolving. Developing an ethical framework that is capable of ‘explicitly dismantling [those] structural inequalities’ which Eubanks⁵⁴ fears may be inherent in such vast assemblages, is thus unlikely to come from a corporate ethics committee, even one which attempts to include all its key stakeholders, nor from an expert committee which focuses on producing outputs such as checklists and questionnaires for private and public sector organisations.

4. Towards a More Holistic AI Ethics Framing

The contemporary corporate and governmental focus on developing ethics frameworks for AI is primarily concerned with the shaping of the future direction of the regulation of AI usage, including personalisation. Development of ethics frameworks, whether by the EU, nation states or corporate actors, alongside the creation of expert groups and institutional ethics boards, are a key element in making a case for self-regulation as capable of addressing the diverse range of risks and problems that may arise. As a corollary, it can be argued governmental regulation - whether through legislation, creation of regulatory agencies or other regulatory means - will thereby be rendered unnecessary.

This approach appears flawed in several critical respects. First, it is predisposed to assess the problematics of AI and 'algorithmic assemblages' via a limited CSR-influenced framing of the ethical risks and resort to a restricted range of 'established' regulatory techniques with which organisations are already familiar and can readily incorporate into established business practices. While this may have the advantage that it is easier to persuade organisations to adopt these techniques, it leaves open the question of whether those techniques are actually suited to the AI context and the particular issues it raises, and makes it more difficult to examine and, if appropriate, promote alternative techniques, whether technical or non-technical. This reliance on pre-existing regulatory theory and practices also fails to take advantage of a burgeoning contemporary science-and-technology-studies literature. That literature emphasises the importance of paying attention to the risks and biases inherent in the sociological and normative features of socio-technical networks created, or given new impetus, by AI, and counsels the wisdom of adopting as holistic an approach as possible to any framing of the discussion. It also opens up hitherto underexplored regulatory questions. For example, what is the extent to which a narrow concentration on avoiding specific categories of discrimination or disadvantage obscures the need to tackle less obvious, but potentially equally problematic, social and cultural issues, such as those derived from the unacknowledged leveraging of social and cultural advantages [see Chapter X Noelia]?

Second, those advocating ethical frameworks and oversight to prevent harms from AI systems underestimate the difficulty of making them work effectively against organisational constraints. Thus, for example, in contrast to the principles and objectives outlined in frameworks, such as the *Ethics Guidelines*, the real world practice of ethical review and oversight within organisations designing, developing and deploying AI to date, suggests a lack of transparency and limited understandings and practice of accountability.

Third, where national governments, or supranational actors, such as the EU, do not take a leading role in evaluating the ethical risks of AI, this inevitably cedes the regulatory initiative to the very entities who are the likely target of regulation - by leaving key issues, such as the choice of experts, advisors and stakeholders consulted, and the scope of the questions that are deemed necessary to address, in their hands. Those potential regulatory subjects are likely to give (indeed, in the case of corporations and their shareholders, may be effectively mandated to give) prominence to the opinions and positions of their key stakeholders, which may not capture critical issues of wider social importance. Even where policy guidance is sought from expert

groups, if those groups are dominated by representatives of corporations producing or utilising AI, and individuals or organisations that have significant existing interactions or financial relationships with such corporations, this may call into question both a group's independence, and its ability or willingness to explore issues or courses of action that do not marry up to conventional CSR discourses. In the EU, the High-Level Expert Group on AI's *Ethics Guidelines* suggests that currently ethical policy guidance is being provided to the EU Commission and the Member States by a relatively small group of experts, by reference to a relatively narrow theoretical and disciplinary base, and on the basis of limited empirical evidence. There is little direct or indirect input from the public or civil society groups that might ground more nuanced understandings of existing and potential structural inequalities, and unexpected social and cultural impacts. Thus, by focusing upon business friendly, individual rights-focused, risk assessment-based regulation, the current ethics discussion cannot take a holistic view of the social impacts of AI and personalisation.

It is encouraging that, as was the case with Corporate Social Responsibility, there has been a growing critical response to the various iterations and aspects of 'ethical AI', from analysis of the 'abstraction traps' of *fair* machine learning methodologies,⁵⁵ to dissection of the failings of anti-discrimination law and practices when faced with complex socio-technical systems that require an intersectional-aware response.⁵⁶ The social sciences and humanities are already generating a wealth of evidence and analysis that are capable of grounding and supporting more sophisticated political and legal interventions into 'algorithmic assemblages' than have been envisaged to date. If that is the case, it is likely that the *Ethics Guidelines* will simply provide an early marker in the development of an evolving and reflexive field of regulatory practice.

-
- ¹ See eg J Council, 'Bosch Launches AI Training Program for Developers and Managers' *WSJ Pro: Artificial Intelligence* (25 February 2020) <<https://www.wsj.com/articles/bosch-launches-ai-training-program-for-developers-and-managers-11582626602>>; A Loten, 'Trump Wants to Double Spending on AI, Quantum Computing' *Wall Street Journal* (10 February 2020) <<https://www.wsj.com/articles/trump-wants-to-double-spending-on-ai-quantum-computing-11581378069>>
- ² T Scantamburlo, A Charlesworth, N Cristianini, 'Machine Decisions and Human Consequences' in Karen Yeung, M Lodge (eds) *Algorithmic Regulation* (2019, Oxford University Press) 49.
- ³ M Murgia, S Shrikanth, 'How Big Tech is struggling with the ethics of AI' *Financial Times* (29 April 2019) <<https://www.ft.com/content/a3328ce4-60ef-11e9-b285-3acd5d43599e>>
- ⁴ V Eubanks, *Automating Inequality* (2018, St Martin's Press).
- ⁵ J Angwin, J Larson, S Mattu, L Kirchner, 'Machine bias' *ProPublica* (23 May 2016) <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>
- ⁶ C O'Neil, *Weapons of Math Destruction*, (2016, Crown).
- ⁷ AD Selbst, d boyd, SA Friedler, S Venkatasubramanian, J Vertesi, 'Fairness and Abstraction in Sociotechnical Systems' (2019) *FAT* '19: Proceedings of the Conference on Fairness, Accountability, and Transparency*, January 2019, ACM, 59.
- ⁸ EU Commission, *Communication : AI for Europe*, COM(2018) 237 final, Brussels (25 April 2018) 3 ; EU Commission, *Communication: Building Trust in Human-Centric AI*, COM(2019) 168 final, Brussels, (8 April 2019).
- ⁹ UK Department for Business, Energy & Industrial Strategy, *Industrial Strategy: Artificial Intelligence Sector Deal* (26 April 2018) <<https://www.gov.uk/government/publications/artificial-intelligence-sector-deal>>
- ¹⁰ J Vincent, 'The problem with AI ethics' *The Verge* (3 April 2019) <<https://www.theverge.com/2019/4/3/18293410/ai-artificial-intelligence-ethics-boards-charters-problem-big-tech>>
- ¹¹ J Murawski, 'Need for AI Ethicists Becomes Clearer as Companies Admit Tech's Flaws' *WSJ Pro: Artificial Intelligence* (1 March 2019) <https://www.wsj.com/articles/need-for-ai-ethicists-becomes-clearer-as-companies-admit-techs-flaws-11551436200>. In the wider research environment, UK Research and Innovation have, as part of their £100 million investment towards the development of AI research, funded the Centre for Doctoral Training in Interactive Artificial Intelligence at the University of Bristol to 'train the next generation of innovators in human-in-the-loop AI systems, enabling them to responsibly solve societally important problems.' University of Bristol, *Press Release: University awarded an additional Centre for Doctoral Training in Artificial Intelligence* (21 Feb 2019).
- ¹² A Ogun, 'Re-thinking Self-Regulation' (1995) 15(1) *Oxford Journal of Legal Studies* 97; NA Gunningham, J Rees, 'Industry Self-Regulation: An Institutional Perspective' (1997) 19(4) *Law & Policy* 363; C Parker, *The Open Corporation: Self Regulation and Democracy* (2002, Cambridge University Press).
- ¹³ I Ayres, J Braithwaite, 'Tripartism: Regulatory Capture and Empowerment' (1991) 16(3) *Law & Social Inquiry* 435; M Priest, 'The Privatization of Regulation: Five Models of Self Regulation' (1998) 29 *Ottawa Law Review* 233.
- ¹⁴ C Besio, A Pronzini, 'Morality, Ethics, and Values Outside and Inside Organizations: An Example of the Discourse on Climate Change' (2014) 119 *Journal of Business Ethics* 287.
- ¹⁵ D Matten, J Moon, "'Implicit" and "Explicit" CSR: A Conceptual Framework for a Comparative Understanding of Corporate Social Responsibility' (2008) 33(2) *Academy of Management Review* 404, 405.
- ¹⁶ *Ibid* 410.
- ¹⁷ See e.g. M Hopkins, (2005) 'Criticism of the Corporate Social Responsibility Movement' in Mullerat, R. (ed.) *Corporate Social Responsibility: The Corporate Governance of the 21st Century* (pp. 473-484) (2005, Kluwer); R Mullerat, *International Corporate Social Responsibility* (2009, Kluwer); P Fleming, MT Jones, *The End of Corporate Social Responsibility: Crisis and Critique*, (2012, Sage).

-
- ¹⁸ ML Barnett, 'The Business Case for Corporate Social Responsibility: A Critique and an Indirect Path Forward' (2019) 58(1) *Business & Society* 167.
- ¹⁹ S Shane & D Wakabayashi, 'The Business of War': Google Employees Protest Work for the Pentagon' *New York Times* (4 April 2018).
- ²⁰ Fang, 'Google Continues Investments in Military and Police AI Technology Through Venture Capital Arm' *The Intercept* (23 July 2019). <https://theintercept.com/2019/07/23/google-ai-gradient-ventures/>
- ²¹ O Williams, 'How Big Tech funds the debate on AI ethics' *New Statesman* (6 June 2019) <<https://www.newstatesman.com/science-tech/technology/2019/06/how-big-tech-funds-debate-ai-ethics>>
- ²² High-Level Expert Group on AI, *Ethics Guidelines for AI, European Commission* (8 April 2019) <<https://ec.europa.eu/futurium/en/ai-alliance-consultation/guidelines>>
- ²³ A Hern, 'Whatever happened to the DeepMind AI ethics board Google promised?' *The Guardian* (26 Jan 2017) <<https://www.theguardian.com/technology/2017/jan/26/google-deepmind-ai-ethics-board>>. Even where conflicts of interest are identified, it is clear that if a company decides the composition and membership of its ethics board, it will be in a position to indirectly influence the nature of discussions that take place, particularly if members have been, or could be, beneficiaries of research funding or consultancies; or might simply benefit from the association of their name (or that of their research institution) with an internationally recognised company. In essence, as one commentator has put it, in those circumstances, companies effectively get to "choose their own critics." (Poulsen quoted in Vincent above n 10).
- ²⁴ IL Janis, 'Groupthink' in RP Vecchio, RP Vecchio (eds), *Leadership: Understanding the dynamics of power and influence in organizations* (2nd ed, 2007 University of Notre Dame Press) 157.
- ²⁵ CJ Nemeth, JA & Goncalo, 'Influence and persuasion in small groups' in TC Brock and MC Green (eds), *Persuasion: Psychological Insights and Perspectives* (2005, Sage) 171; E Pariser, *The Filter Bubble* (2011, Penguin Press).
- ²⁶ *Ethics Guidelines* above n 22, 4 and 39. Representatives outside these categories are few and far between.
- ²⁷ *Ethics Guidelines* above n 22, 23.
- ²⁸ *Ethics Guidelines* above n 22, 26-31. The stakeholder participation element of the Assessment List itself (p.30) is brief and skewed towards workers and their representatives, possibly because one of the few participants who was not a corporate representative, AI researcher, or academic, was a Trade Unions representative.
- ²⁹ Pariser above n 25,
- ³⁰ S Helin, J Sandström, 'Resisting a corporate code of ethics and the reinforcement of management control' (2010) 31(5) *Organization Studies* 583.
- ³¹ For example, KD Haggerty, 'Ethics creep: Governing social science research in the name of ethics' (2004) 27(4) *Qualitative Sociology* 391; M Hammersley, 'Creeping ethical regulation and the strangling of research' (2010) 15(4) *Sociological Research Online* 16; J Taylor, M Patterson, 'Autonomy and compliance: How qualitative sociologists respond to institutional ethical oversight' (2010) 33(2) *Qualitative Sociology* 161.
- ³² L Stark, 'Victims in Our Own Minds? IRBs in Myth and Practice' (2007) 41(4) *Law and Society Review* 777; R Eynon, R Schroeder, J Fry, 'New techniques in online research: Challenges for research ethics' (2009) 4 (2) *Twenty-First Century Society* 187; S Clegg, 'The possibilities of sustaining critical intellectual work under regimes of evidence, audit, and ethical governance' (2010) 26(3) *Journal of Curriculum Theorizing* 21; D Erdos, 'Systematically handicapped? Social research in the data protection framework' (2011) 20(2) *Information and Communications Technology Law* 83.
- ³³ A Charlesworth, 'Data Protection, Freedom of Information and Ethical Review Committees: Policies, Practicalities and Dilemmas' (2012) 15(1) *Information, Communication & Society*: 85.
- ³⁴ For example, NHS Ethics Review Committees. Much of this oversight requires researchers to complete ethics review documentation for scrutiny, and often a dialogue between ethic review committees and researchers to ensure that institutional and discipline requirements have been duly observed and documented. If ethical clearance is granted, this documentation should, in theory, in combination with researcher's records of ongoing compliance with ethical requirements post-clearance, provide the basis for audit of ethical practice by the researcher at any point during or after their research.

-
- ³⁵ For example, AoIR *Ethical Decision-Making and Internet Research: Recommendations from the AoIR Ethics Working Committee* (Version 2.0) (2012) <http://aoir.org/reports/ethics2.pdf>; SLSA *Statement of Principles of Ethical Research Practice* (2009) <https://www.slsa.ac.uk/index.php/ethics-statement>
- ³⁶ See eg *Research Ethics* (Sage); *Journal of Empirical Research on Human Research Ethics* (Sage); *IRB: Ethics & Human Research* (Hastings); *Accountability in Research* (Taylor & Francis).
- ³⁷ *Ethics Guidelines* above n 22, 21f.
- ³⁸ To provide ‘oversight and advice’ and developing interaction with industry and civil society groups.
- ³⁹ *Ethics Guidelines* above n 22, 22f.
- ⁴⁰ D Rowland, U Kohl, A Charlesworth, *Information Technology Law* (4th ed, 2011 Routledge) Ch12 on Defective Software.
- ⁴¹ *Ethics Guidelines* above n 22, 19.
- ⁴² *Ethics Guidelines* above n 22, 31: Did you assess the broader societal impact of the AI system’s use beyond the individual (end-)user, such as potentially indirectly affected stakeholders?
- ⁴³ AL Hoffmann, ‘Where fairness fails: data, algorithms, and the limits of antidiscrimination discourse’ (2019) 22(7) *Information, Communication & Society* 900.
- ⁴⁴ *Ibid* 903f
- ⁴⁵ *Ibid* 905ff.
- ⁴⁶ Eubanks above n 6, 5.
- ⁴⁷ Hoffman above n 42, 907ff.
- ⁴⁸ In the data privacy context, this regulatory approach finds public sector medical data provided to the private sector without public consultation (C Stokel-Walker, ‘Why Google consuming DeepMind Health is scaring privacy experts’ *Wired* (14 Nov. 2018) <https://www.wired.co.uk/article/google-deepmind-nhs-health-data> ; A Hern, ‘Google ‘betrays patient trust’ with DeepMind Health move’ *The Guardian* (14 Nov 2018) <https://www.theguardian.com/technology/2017/jan/26/google-deepmind-ai-ethics-board>); six million CCTV cameras on the UK’s streets (S Carlo, ‘Britain Has More Surveillance Cameras Per Person Than Any Country Except China. That’s a Massive Risk to Our Free Society’ *Time* (17 May 2019) <https://time.com/5590343/uk-facial-recognition-cameras-china/>); and bulk interception of communications ‘that intrudes upon every UK citizen’s life in a way that would even a decade ago have been inconceivable’ (P Bernal, ‘How the UK passed the most invasive surveillance law in democratic history’ *The Conversation*, (23 Nov 2016) <https://theconversation.com/how-the-uk-passed-the-most-invasive-surveillance-law-in-democratic-history-69247>).
- ⁴⁹ Selbst above n 7; Hoffman above n 42; H Rosenbaum, P Fichman ‘Algorithmic accountability and digital justice: A critical assessment of technical and sociotechnical approaches’ (2019) 56(1) *ASIS&T* 237.
- ⁵⁰ M Ananny, ‘Toward an Ethics of Algorithms: Convening, Observation, Probability, and Timeliness’ (2016) 41(1) *Science, Technology, & Human Values* 93, 97.
- ⁵¹ *Ibid* 98
- ⁵² I Lowrie, ‘Algorithms and Automation: An Introduction’ (2018) 33(3) *Cultural Anthropology* 349, 351.
- ⁵³ *Ibid*.
- ⁵⁴ Eubanks above n 6, 5.
- ⁵⁵ Selbst above n 7.
- ⁵⁶ Hoffman above n 42.