# Book Review: *Privacy, Due Process and the Computational Turn*

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*Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science*

Mireille Hildebrant and Katja Vries (eds)

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## Introduction

> *We become transparent in the sense that the profiling software looks straight through us to "what we are like", instead of making transparent "what or who we are". This reminds me of a cartoon that shows a couple, sitting up in bed—after the act—confronted with a voice-over that proclaims: "I'm glad you enjoyed that. People who like that technique also enjoyed these sexual techniques."*[1]

As the quotation above illustrates, the changes that result from our 'technological age' are not only controversial but they touch upon fundamental conceptions of what it means to be human: dignity, integrity and the moral autonomy of the human being. This point describes the substantive purpose behind Mireille Hildebrandt and Katja Vries' edited volume: *Privacy, Due Process and the Computational Turn*. In light of current technological changes, this edited volume considered the effects that data science and machine

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[1] Mireille Hildebrandt, 'Profile Transparency by Design? Re-enabling Double Contingency' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 221.

learning are having on society. More specifically, the authors in the volume demonstrated that our 'technological age' has created a 'computational turn'[2] and in discussing this phenomenon, the nine authors in this volume considered the effects that new computer technologies are having on societal values such as individual autonomy, privacy and due process.

Substantive topics that concerned the authors of this edited volume included, but were not limited to; Government profiling, criminal profiling, terrorist watch lists, no fly lists, behavioural advertising, customer relationship management, personalised news feeds and smart search engines. While the purpose of this volume was to investigate the effects that these substantive topics are having on societal values such as privacy, autonomy and due process, the authors discussions on the means that allow for governments and corporations to utilise such tools—for example, data mining, machine learning and artificial intelligence; and, the moral and ethical implications of these technologies, were well articulated, thought-provoking and fascinating. Indeed, the authors of this volume did an excellent job providing an outline for how and why governments and corporations are developing and utilising new computer-based technologies and the implications that these technologies have for the dignity, integrity and moral autonomy of the human being.[3]

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[2] The 'computational turn' is a reference to the idea that we—humans—co-exist with machines that are capable of using data to anticipate, profile, cluster or classify human behaviour. These machines learn on the basis of feedback and by modelling scenarios defined by incomplete information. In the context of the collection of essays in this volume, the authors discuss machine learning technologies that make inferences based on correlations—not observable trends— and generate hypotheses—not generated from traditional scientific methodologies. Governments and corporations are therefore using these new information technologies to create risk assessments, credit scoring, conduct marketing, undertake criminal profiling and engage in anti-money laundering schemes (to list a few examples): See Mireille Hildebrandt and Katja Vries, 'Preface' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) xiii-xiv.

[3] See for instance Ian Kerr's discussion on due process and how Lon Fuller's moral conception of due process are being eroded or perhaps destroyed by government and corporate uses of technological innovation: Ian Kerr, 'Prediction, Pre-emption,

In three substantive sections: 'Data Science', 'Anticipating Machines', and 'Resistance & Solutions'; the authors presented a compelling argument for why and how the 'computational turn' is changing society and eroding due process and the right to privacy.[4] However, what was missing from this volume was a comprehensive discussion on law and society and how social policy and established legal and political institutions could be used to manage and control the computational turn. For example, a discussion on how individuals could challenge government and corporate 'computational' practices in various courts of law or by addressing issues such as privacy with elected representatives would have enriched the authors' analyses on the relationship between privacy, due process and the computational turn.

## A Changing World: Technology's effect on Society

Perhaps the most important lesson to take from *Privacy, Due Process and the Computational Turn*, is that data science and machine learning are having a profound effect on the relationship between individuals and governments and individuals and corporations.[5] What is interesting, however, is that the changes created by the computational turn are not necessarily negative. While the discussion was orientated towards the negative, or more worrying, aspects of computation technologies at various times in this volume the reader came across rationalisations for why governments and corporations are relying on data mining and machine learning techniques. For example, it can be argued that governments and corporations utilise large-scale data gathering

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Presumption: The Path of Law after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 110-112.

[4] See for instance, Ian Kerr's discussion on the social consequences of computational turn: ibid 91-120.

[5] See for instance, Bert-Jaap Koops' discussion on transparency, resistance and change: Bert-Jaap Koops, 'On Decision Transparency, or How to Enhance Data Protection after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 196-220.

techniques and develop algorithmic technologies so that they can identify trends and patterns that are beyond the cognitive abilities of the human being. The thought is, these technologies allow for enhanced institutional decision-making. More specifically, the 'conceptual turn' allows governments and corporations to 'cope with the complexities of a world of massive flows of person, objects, and information'[6] and allows decision-making bodies to anticipate human phenomena and cope with global trends without being subjected to the irrational components of human-nature: emotional, politically, and racial biases.[7]

Assuming that emotional, political and racial biases skew the human ability to engage in rational decision-making, a logical solution is to train/program machines to identify patterns and formulate inferences based on criteria that are deemed relevant. Indeed what was not discussed by the authors in this volume was that although—in theory—data mining techniques may intrude on the privacy of the individual, we should not forget that history has demonstrated that humans are prone to similar trends. Perhaps the advantage of machine learning is that a machine will not form prejudices based on grounds such as race, sex, age or sexual orientation. Nevertheless, and as was well argued by Katja De Vries in the opening chapter, the problem (illustrated by the parable of the three robotic dogs[8]) is that

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[6] Antoinette Rouvroy, 'The End(s) of Critique: Data Behaviourism versus Due Process' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 143.

[7] ibid 147.

[8] The parable of the three robotic dogs is a hypothetical scenario were three families each owned a robotic dog (artificial intelligence). The dogs were tasked with patrolling the house and protecting the family from 'suspicious people'. Family one told their dog that a 'suspicious person' was someone who fit the characteristics of fixed rules: 'adult' and 'passing by more than three times within a time span of one hour' or, the characteristics 'beard' and 'climbing' and is not a 'family member'. The second family, over a specific period of time, showed the dog examples of 'suspicious people', the third family told the dog to gather data and determine what a 'suspect person' looked and acted like. In the end, it became commonplace that all three dogs would identify 'suspect people' who were in the neighbourhood for legitimate reasons. Despite the robotic dogs heightened memories and ability to identify patters and trends, they were not able to distinguish who was 'suspect' and who 'belonged': Katja de Vries, 'Privacy, Due Process and the Computational Turn: A Parable and a First Analysis' in Mireille Hildebrandt and Katja Vries (eds),

it is not possible to train or program a machine (artificial intelligence) to ignore human characteristics such as emotional, political and racial bias, while taking into consideration human values such as autonomy, privacy, and the dignity and moral autonomy of the human being.[9]

Perhaps, an optimal way of considering the points that were discussed above is providing a brief analysis of Lorenzo Magnani's third chapter 'Abducing Personal Data, Destroying Privacy: Diagnosing Profiles through Artifactual Mediators'.[10] In his chapter, Magnani makes the point that in today's technological age, knowledge is not only a virtue, it is a duty.[11] Although society, at its core, can be said to be defined by change and evolution—and considering the positive aspects of the computational turn— Magnani's argument rests on the principle that while some aspects of the computational turn may enrich society, those same aspects can erode other 'pillars of our civilisation'.[12]

This was Magnani's point when he argued that data infringes on human dignity and autonomy, creates scapegoats and creates a less

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*Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 9-37.

[9] As discussed by Ian Kerr: 'Unlike lawyers or other professionals, computational prediction systems do not generate relationships of trust and therefore do not attract special duties of care in any traditional sense. Therefore, data generated decision making often requires that the data generating process waive various rights to privacy and due process': Ian Kerr, 'Prediction, Pre-emption, Presumption: The Path of Law after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 100.

[10] Lorenzo Magnani, 'Abducing Personal Data, Destroying Privacy: Diagnosing Profiles through Artifactual Mediators' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 67-90.

[11] Although Magnani acknowledges the fundamental importance of 'new knowledge', he asks the question, does the right to gather and utilise new knowledge trump other rights? In answering this question, Magnani contends that 'when too much knowledge about people is contained in external artificial things, human beings "visibility" can become excessive and dangerous': ibid 68.

[12] ibid 67-90.

free world through data discrimination.[13] What was not discussed however was what Hildebrandt's described as 'societal engineering'[14] or, more specifically, how it is possible to guide the computational turn in a direction that allows for its benefits but protects individuals from intrusive privacy violations or a denial of due process?

## Speculation by Analysis v Analysis Based on Facts: a Methodological Perspective

Like Magnani's analysis on how the computational turn is eroding principles such as the right to privacy and due process, a reoccurring theme throughout this volume was the use of analogies that allowed the authors to form non-empirical, conceptual arguments about technology, privacy and due process. While the use of such argumentative methods made interesting parallels between philosophy of law and the philosophy of science, what was missing was a pragmatic evaluation of the actual effects of our 'technological age'. The effect of such methods was that the authors were successful in forming convincing—albeit hypothetical—arguments, but on an aggregate level, failed to substantiate their claims.

To illustrate the point above consider the following examples. In chapter one, Katja de Vries introduced the parable of the three robotic dogs and argued that although algorithmic knowledge gathering or knowledge creating creates and attributes meaning to new concepts—via, the replication of the human cognitive process— the computational processing method is not capable of considering human characteristics such as linguistics, emotions, context and

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[13] Magnani substantiates these points by arguing that there is an unequal access to information (for example, individuals do not have access to the data that is used to make inferences about them) and by pointing out that computer profiling involves the use of personal data to make decisions that affect people's lives—absent those who are effected being involved or aware of the profiling procedure —as is done in non-democratic police states: ibid 70.

[14] See Mireille Hildebrandt's discussion on the possibilities and merits of 'societal engineering': Mireille Hildebrandt, 'Profile Transparency by Design? Re-enabling Double Contingency' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 221-246.

judgement.[15] In the second chapter Martijn van Otterlo drew on the works of Jeremy Bentham and the concept of a Panopticon society[16] and argued that—on analogical grounds—that an 'all seeing eye' allows governments and corporations 'to infer knowledge about an individual who is not actually observed'.[17] In the fourth chapter Ian Kerr invoked the classical works of Oliver Wendell Holmes and in making the observation that the computational turn allows 'prediction' 'to replace the need for proof'[18] asked, 'are we sleepwalking into a surveillance society?'[19]

Indeed, throughout this collection of articles, the authors relied upon influential philosophical thinkers such as, inter alia, Jeremy Bentham, Oliver Wendell Holmes, John Stuart Mill, Immanuel Kant, Lon Fuller and John Rawls. Additionally, the authors made use of literary works[20] and devised hypothetical scenarios such as the one that is seen in the onset of this book review. In considering the use of such methods, it can be observed that there are two implications for

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[15]  Katja de Vries, 'Privacy, due process and the computational turn: a parable and first analysis' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 17.

[16] The Panopticon society is a reference to Jeremy Bentham's design of a Panopticon prison. In his design, there is a central guard tower and all prison cells are made of glass. This allows the guards to observe the prisoners at any given time. Although each prisoner will not be observed 100% of the time, the prisoner will never know when they are or when they are not being observed (similar to city that is covered with CCTV cameras). The Panopticon has been proven to have profound psychological effect on human behaviour: See Martijn Van Otterlo, 'A Machine Learning View on Profiling' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 41-64.

[17] ibid 43.

[18] Ian Kerr, 'Prediction, Pre-emption, Presumption: the Path of Law after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 102.

[19] ibid 106.

[20] See for instance, Mireille Hildebrandt's use of *'Though the Looking Glass, and What Alice Found There'*: Mireille Hildebrandt, 'Profile Transparency by Design? Re-enabling Double Contingency' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 224.

making conceptual arguments based on analogy. The first implication was positive. By making use of such methods, the authors effectively demonstrated that the computational turn is having a profound effect on society.

When we consider the fact that machine learning and data mining techniques are used to create airplane passenger risk assessments, terrorist watch lists, credit scoring, smart cameras, targeted marketing, anti-money laundering schemes, criminal profiles etc, it becomes apparent that values such as privacy, self-determination, and the dignity and moral autonomy of human beings are indeed effected. From this perspective, philosophical and literary figures are perhaps the most useful references to make inferences on social/societal phenomenon when values such as human rights and due process are at stake. After all, if an individual is arbitrarily prohibited from boarding an airplane due to an algorithmic outcome that deems that this person fits the 'risk profile',[21] in the name of national security and the protection of society, it can be argued that 'the right to privacy [and freedom from arbitrary government intervention] and the right to due process do not prohibit power asymmetries as such but allow one to put the appropriateness of power asymmetry to the test'.[22]

A negative implication of forming conceptual arguments based on analogy is that these arguments make inferences that have similarities to the logical, algorithmic and data driven inferences that the authors are concerned about. A general theme in this volume is that computational decision-making is drawing its inferences based on correlations and patterns rather than observable and causal facts. Ian Kerr is particularly concerned with the notion of pre-emption, in that, contemporary predictive and correlation driven technologies

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[21] As pointed out by Ian Kerr, infants and deceased individuals have made their way onto these 'risk lists': Ian Kerr, 'Prediction, Pre-emption, Presumption: The Path of Law after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 99.

[22] Katja de Vries, 'Privacy, Due Process and the Computational Turn: A Parable and a First Analysis' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 19.

threaten due process by focusing on the hypothetical: what could happen and what might happen, instead of, what has happened.[23]

Paradoxically, although it is true that governments and corporations will rely on predictive technologies to prevent, forestall, and influence human behaviour, the authors of this volume rely on analogy based conceptions of philosophy and literature to predict and perhaps influence the computational turn in a manner that is not based on observable facts and verifiable trends. For example, while Ian Kerr invokes memories of the *Stasi State*, Antoinette Rouvroy argued that 'algorithmic reasoning' escapes the traditional means of justice and decision-making such as the 'types of trials, tests, examinations, experiments and other épreuves or challenges that usually appear essential to attest to the robustness, truth, validity or legitimacy of claims and hypothesis formulated about reality in the scientific, the judicial and even the existential domains'.[24]

The point to this line of argument is not to challenge the conceptual arguments or predications. Rather, from a methodological perspective, the question that needs to be asked is, assuming that values such as privacy and due process are being eroded, why have the authors excluded traditional legal analytical methods that focus on verification and proof; case law, human testimony, and real life experiences and scenarios? Excepting the claim that 'algorithmic governmentality bypasses consciousness and reflexivity, and operates on the mode of alerts and reflexes',[25] it appears that what is needed is a procedural review of government and corporate computational practices and policies that regulate such practices and when necessary, political and judicial challenges to the status quo. More specifically, the unanswered question that this edited volume elicits is, have individuals challenged government and corporate

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[23] Ian Kerr, 'Prediction, Pre-emption, Presumption: The Path of Law after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 91-121.

[24] Antoinette Rouvroy, 'The End(s) of Critique: Data Behaviourism versus Due Process' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 151.

[25] ibid 153.

'computational' decision-making in a traditional judicial or political realm such as bringing cases to court or contacting democratically elected representatives, and if not, why have issues that have such a profound effect on the individuals and society not been challenged?

## Social Policy: Capturing the Power and Limiting the Societal Effect of the Computational Turn

> *The problem is, how can traditional laws of our constitutional democracies protect people's privacy, given the fact that profiling technologies—as I will soon explain—cannot be touched by laws as we traditionally intend them.*[26]

As discussed in the previous section, in his chapter 'Prediction, Preemption, Presumption: The Path of Law after the Computational Turn',[27] Ian Kerr discussed Oliver Wendell Holmes' classic essay 'The Path of Law' so as to illustrate how it is fundamentally important that one can predict the law, and how, in our technological age, the computational turn is making it increasingly difficult to do just that.[28] Continuing with this line of thinking, a reoccurring concept throughout this volume was the idea that given the absence of law and regulation, the computational turn is having such a profound effect on society because 'new' technological innovations are capable of guiding the law in a way that is not intrusive to the goals of those utilising new technologies. Given these

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[26] Lorenzo Magnani, 'Abducing Personal Data, Destroying Privacy: Diagnosing Profiles through Artifactual Mediators' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 76.

[27] Ian Kerr 'Prediction, Pre-emption, Presumption: The Path of Law after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 91-121.

[28] Invoking Kerr's analysis of Oliver Wendell Holmes, it can be argued that although issues such as national security and law and order are serious concerns, the point of this analysis is that if we allow technological innovations to erode due process and to succumb to a reality where 'the bad man cannot predict the law' we will inevitably be creating greater security concerns for the individual as the government will be empowered to arbitrarily intervene in the lives of the individual (as what happened in the Stasi state): ibid 92-95.

facts, there is therefore reason to argue that what is needed is the development of a robust social policy framework.[29]

At various times in this volume the reader came across convincing arguments that made the point that in order to preserve societal values such as the dignity and moral autonomy of the human being, what is needed is a policy initiative that would allow for the computational turn to develop and perpetuate under a framework that supports transparency and public oversight.[30] However, the means for achieving a policy framework that would allow for transparency and public oversight were not developed to the extent that they should have been. For example, in the seventh chapter 'Political and Ethical Perspectives on Data Obfuscation',[31] the authors developed a framework for resistance called 'obfuscation'.[32] Despite the fact that 'obfuscation' appeared to provide viable responses to contemporary technological innovations that intrude on privacy and individual autonomy, and although 'obfuscation' can—in certain instances—be morally and ethically justifiable, 'obfuscation' is not a policy response to the computational turn.

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[29] Mireille Hildebrandt argues that a social structure that is designed to regulate the computational turn must 'develop a certain autonomy and thus provide a more stable object for the coordination of human interaction': Mireille Hildebrandt, 'Profile Transparency by Design? Re-enabling Double Contingency' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 223.

[30] Katja de Vries, 'Privacy, Due Process and the Computational Turn: A Parable and First Analysis' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 22-23; Bert-Jaap Koops, 'On Decision Transparency, or How to Enhance Data Protection after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 196-220.

[31] Finn Brunton and Helen Nissenbaum, 'Political and Ethical Perspectives on Data Obfuscation' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 171-196.

[32] 'Obfuscation' can be defined as the production of misleading information with the intention of skewing the data. According to the authors, there are four kinds of obfuscation: time-based, cooperative, selective and ambiguating obfuscation: See ibid 171-181.

Indeed, 'obfuscation' was meant as a means of resistance that could respond to extreme infringements on the privacy and rights of the individual; however, this concept was developed under the assumption that society needs to 'fight back' against the 'computational turn'. Thus, the argument that this section is developing is that society does not need to fight back. Social policy, if developed properly, can accomplish the same goal—transparency and public oversight—without conceding that the response to the technological revolution should be the creation of 'weapons for the weak'. In other words, the response to this 'technological revolution' should not be to stage something akin to a modern day revolution and obstruct the 'computational turn'.[33]

Moving away from the concept of 'obfuscation', Mireille Hildebrandt made an interesting observation. In her concluding chapter she discussed how due process can be used as a possible mechanism that could allow individuals to contest government and corporate decisions and confront technological realities that have an effect on their lives.[34] At first glance, this argument seemed contradictory because, this edited volume—for the most part—has focused on how technology is eroding due process: the opposite of the idea that due process can be used to control technology. However, what this line of argument suggested was that there are already legal and political mechanisms that can protect privacy and individual autonomy from the computational turn. For example— and what was missing from this analysis is—how can exiting institutions; courts, legislatures, and regulatory authorities be used to

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[33] Brunton and Nissenbaum note an excellent example where the United States Center for Disease Control and Prevention attempted to track infected supermarket meat through customer rearwards points cards. Because the data on these cards had been subjected (corrupted) by 'obfuscation', a public agency tasked to protect the health of the general public was not able to do its job. Indeed, there is a strong argument for the idea that there are other means of achieving the goals of 'obfuscation' without engaging in 'revolutionary tactics': ibid 176.

[34] Notice, however, the use of the word 'can'. While Hildebrandt was indicating that such an opinion is possible, there is no evidence that individuals are using due process mechanisms to challenge government and corporate (technological) practices and decisions: Mireille Hildebrandt, 'Profile Transparency by Design? Re-enabling Double Contingency' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 222.

ensure that the computational turn operates in a manner that is open, transparent and vulnerable to public oversight.[35]

Assuming that adequate legislation and regulation were implemented, such legal mechanisms would require government and corporate decision-making bodies to, in Bert-Jaap Koops' words, diminish upward transparency and enhance downward transparency: 'first, upwards transparency can be diminished, thus making the window more opaque for those above looking down. Second, downwards transparency can be enhanced, making the window more transparent for those below looking up'.[36] More specially, similar to how the power of the police have been limited in, for example, search and seizure techniques, DNA processing, and wiretapping; the evolution of technological innovation requires that courts and legislatures consider the tools granted to police and government authorities by the computational turn and create limits that reflect values such as due process, autonomy and dignity. From a corporate perspective, there are already established regulatory regimes that monitor environmental standards, financial markets, food and drug production, etc. Why not establish a regulatory regime that monitors and controls the computational turn so that technology can progress while remaining within a framework that reflects the wider interests of society?[37] In the words of Mireille Hildebrandt, we must harness

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[35] Although Finn Brunton and Helen Nissenbaum engaged with European Union regulation of data technology, the authors did not discuss how modified legislation can create a mutually beneficial framework: Finn Brunton and Helen Nissenbaum, 'Political and Ethical Perspectives on Data Obfuscation' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 171-196.

[36] For example, 'upwards transparency should be improved in order to provide for due process, particularly because the classic checks and balances in criminal law are not tailored to these situations': Bert-Jaap Koops, 'On Decision Transparency, or How to Enhance Data Protection after the Computational Turn' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 203.

[37] In these chapters, the authors did mention European Union polices that consider technology. However, these polices were not engaged with in a meaningful way. What is being suggested here is that the final step in analysing the 'computational turn' should be to consider European Union and 'other' government authority's policy responses to the 'computational turn'.

the power of institutional decision-making and 'engineer a new world'.[38]


## Concluding Thoughts

The argument that has been developed in the book review is that a 'new' social policy framework needs to be developed. This framework is necessary if we are to control, guide and engineer the computational turn as was discussed by the nine authors in Mireille Hildebrandt and Katja de Vries edited volume. Indeed, if the reader is to take one lesson from this edited volume—and there are many lessons to be taken—that lesson should be that we are living in a time of profound change. The computational turn is creating new knowledge, new tools, and redefining how we understand terms such as cognitive thinking and cognitive processing. For example, in this edited volume, it was demonstrated that algorithmic technology relies not on facts and observable trends but on probability models.[39] As was demonstrated in this book, big data and data mining techniques use probability models to make inferences about human behaviour. Indeed, these inferences can and do have profound effects on social values: dignity, autonomy and privacy. If not managed properly, we may be witnessing the erosion of due process and the dignity and moral autonomy of human being.

While this book made inferences about the potential consequences of the erosion of due process and privacy rights—for example, Ian Kerr's reference to the Stasi state and that we may we turning into or,

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[38]Mireille Hildebrandt, 'Profile Transparency by Design? Re-enabling Double Contingency' in Mireille Hildebrandt and Katja Vries (eds), *Privacy, Due Process and the Computational Turn: The Philosophy of Law meets the Philosophy of Science* (Routledge 2013) 236.

[39] For example, consider the problem of theft and robbery or, an elicit bike thief. The computational turn will make it so law enforcement will not rely on evidence or observations to catch the thief. Instead, an algorithm will determine X amount of factors (say, ten factors) that describe a bike thief. An individual may therefore have to endure a police investigation and an invasion of his privacy because he fits nine out of ten characteristics of your average bike thief. In effect, what is being said is, 'we don't have any evidence, we have zero observations to rely on, but, the computer says that it is likely that he is a bike thief, therefore, we shall treat this individual as such'.

have already turned into a modern day version of a surveillance state—the truth of the matter is, at this point in history, we cannot observe with empirical accuracy the 'actual' effect of the computational turn. That is why it is essential that social policy develop in a way that manages and controls this 'technological revolution'. The necessary infrastructural and policy expertise needed to regulate the computational turn are present in our contemporary age. Indeed, most aspects of society are regulated in one way or another. Therefore, the extended argument that needs to be made, and, the one the was not considered by *Privacy, Due Process and the Computational Turn* was how modern day understanding of law, legislation and regulation can 'engineer' the computational turn into a tool that enhances society while respecting limits such as privacy and due process.