THE OPTIMALLY ACCURATE DECISIONMAKER:
Fiduciarising the Judge to Make Data Driven Decision-Making at the Service of the People's Best Interests

by George Bouchagiar (SRN 2033315)

Supervisors: Esther Keymolen and Bart van der Sloot

LLM Law and Technology (Tilburg Institute for Law, Technology, and Society)

Tilburg, October 2019

THE OPTIMALLY ACCURATE DECISIONMAKER:
Fiduciarising the Judge to Make Data Driven Decision-Making at the Service of the People's Best Interests

by George Bouchagiar (SRN 2033315)

Supervisors: Esther Keymolen and Bart van der Sloot

LLM Law and Technology (Tilburg Institute for Law, Technology, and Society)

Tilburg, October 2019

PREFACE

I would like to thank my supervisors, a unique (moving-) library of law and philosophy, who taught me about privacy and trust. Their valuable suggestions enabled me to fulfil my goal; to write my own story that could help people avoid having their own stories written by private data driven technologies. Their advices, going well beyond the context of this thesis, will accompany my future writings.

I would also like to thank Aliki, Sophie, Antonis, Christina and Konstantinos for their tremendous support.

Aliki, this is for you. Thank you!

TABLE OF CONTENTS

I. INTRODUCTION

§I.1. Background and Context

The future is uncertain; and humans have the desire or need to know what is presently unknown.[1] To satisfy this need, people can use technology. Being capable of representing existing data, technology has always assisted humans in better conceptualising and understanding their environment. Going beyond representation, contemporary technologies can be trained on and learn from previous data to foretell future scenarios.[2]

These predictive technologies are at the heart of Big Data; a phenomenon that offers the opportunity to gain potentially accurate insights into future situations. Big Data's structure allows for the analysis of huge datasets. It enables models to process input data, by which they are driven, with a view to foreseeing patterns and delivering outputs. These outputs can be understood as decisions that rely, not on human intuition but, on data processing.[3] Such data driven decision-making is extremely valuable. It can be used to achieve crucial societal advances in numerous fields;[4] from health, where diseases can be predicted or prevented, to environmental policies aimed at designing smart cities, saving energy costs and benefiting society as a whole.[5] Even poverty may be detected, measured and, to some extent, overcome.[6]

Such models may identify and strike down, not only poverty but also, enemy forces.[7] However, they may fail to distinguish between troopers and citizens;[8] they may allow for massacres involving innocent people.[9] When used by police, they may fail to meet fairness; they can result in discriminatory policing, whose biases outweigh any potential benefits.[10] Drawbacks are not only due to potential inaccuracy of data driven decisions. Risks can also predominate, where models are intentionally aimed at fulfilling malicious purposes. They may

---

[1] Bernard Harcourt, 'Against Prediction: Sentencing, Policing, and Punishing in an Actuarial Age' (2005) University of Chicago Public Law & Legal Theory Working Paper 94/2005, 32 <https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1021&context=public_law_and_legal_theory> accessed 5 October 2019.

[2] Eric Siegel, *Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die* (2nd edn, John Wiley & Sons 2016) 137.

[3] Foster Provost and Tom Fawcett, 'Data Science and its Relationship to Big Data and Data-Driven Decision Making' (2013) 1(1) Big Data 51, 53 <https://doi.org/10.1089/big.2013.1508> accessed 5 October 2019.

[4] Shankaracharya and others, 'Computational Intelligence in Early Diabetes Diagnosis: A Review' (2010) 7(4) The Review of Diabetic Studies 252 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3143540/> accessed 5 October 2019; Dennis Hirsch, 'That's Unfair! Or Is It? Big Data, Discrimination and the FTC's Unfairness Authority' (2014) 103 Kentucky Law Journal 345, 346ff <http://www.kentuckylawjournal.org/wp-content/uploads/2015/02/103KyLJ345.pdf> accessed 5 October 2019; Ariel Porat and Lior Jacob Strahilevitz, 'Personalizing Default Rules and Disclosure with Big Data' (2014) 112(8) Michigan Law Review 1417, 1435 <http://repository.law.umich.edu/mlr/vol112/iss8/2> accessed 5 October 2019.

[5] Jules Polonetsky and Omer Tene, 'Privacy and Big Data: Making Ends Meet' (2013) 66 Stanford Law Review Online 25, 28-30 <https://cyberlaw.stanford.edu/files/publication/files/PolonetskyTene.pdf> accessed 5 October 2019.

[6] Christopher Njuguna and Patrick McSharry, 'Constructing Spatiotemporal Poverty Indices from Big Data' (2017) 70 Journal of Business Research 318 <https://doi.org/10.1016/j.jbusres.2016.08.005> accessed 5 October 2019.

[7] Michael Mayer, 'The New Killer Drones: Understanding the Strategic Implications of Next-Generation Unmanned Combat Aerial Vehicles' (2015) 91(4) International Affairs 765 <https://doi.org/10.1111/1468-2346.12342> accessed 5 October 2019; Michael Carl Haas and Sophie-Charlotte Fischer, 'The Evolution of Targeted Killing Practices: Autonomous Weapons, Future Conflict, and the International Order' (2017) 38(2) Contemporary Security Policy 281 <https://doi.org/10.1080/13523260.2017.1336407> accessed 5 October 2019.

[8] Danielle Keats Citron and Frank Pasquale, 'The Scored Society: Due Process for Automated Predictions' (2014) 89(1) Washington Law Review 1, 7.

[9] Lauren Wilcox, 'Embodying Algorithmic War: Gender, Race, and the Posthuman in Drone Warfare' (2017) 48(1) Security Dialogue 11 <https://doi.org/10.1177/0967010616657947> accessed 5 October 2019.

[10] Richard Berk, 'Accuracy and Fairness for Juvenile Justice Risk Assessments' (2019) 16(1) Journal of Empirical Legal Studies 175 <https://doi.org/10.1111/jels.12206> accessed 5 October 2019.

be used by Internet giants to engage in deceptive practices[11] or to conduct monitoring-experiments.[12] They may be deployed by employers to reject job applications, by banks to deny loans[13] or in schools to watch children's behaviour.[14] In the era of '"just-in-case" "watch everything" "more data is better"',[15] when even intelligent dolls may be used for monitoring,[16] people are becoming peculiarly vulnerable.

Vulnerability may be increased, where such decision-making is opaque and unintelligible; and it may be further exploited by new forms of Artificial Intelligence (AI) that can construct smart models. AI models can make even more intelligent decisions as they learn via Machine Learning (ML); a learning inferior to Deep Learning (DL), where 'all' data are collected and analysed for ever-changing purposes. These new technological developments can magnify unintelligibility, opacity and further complexities that emerge as undesirable consequences of Big Data. Contemporary models seem to be aimed at predicting potential behaviours, which can, in turn, constitute the grounds of mistreating decisions. One may be denied an opportunity for a behaviour that she might, or might never, express at some future time. Admittedly, the fact that one is denied the opportunity to be presented with a result, when using a private search engine, may not be of the greatest importance. But things get serious, where public actors use private data driven models in the course of exercising public authority.

In the public sphere, mandatory mechanisms of checks and balances can guarantee that decisions made by public actors are in the best interests of the people.[17] A prime example is the fiduciary judge. Required to serve the people's best interests, the judge is bound by the fiduciary duty of reasonableness and fairness; that is, she must sufficiently justify the decision-making and adhere to procedural fairness. However, public actors can now use private technologies, which make data driven decisions in numerous domains of utmost importance. For instance, private models may forecast the place and time of crime,[18] suggest ways to monitor citizens,[19]

---

[11] Nico van Eijk, Chris Jay Hoofnagle and Emilie Kannekens, 'Unfair Commercial Practices: A Complementary Approach to Privacy Protection' (2017) 3 European Data Protection Law Review 325, 327ff.

[12] Kieron O'Hara, 'Data, Legibility, Creativity … and Power' (2015) 19(2) IEEE Internet Computing 88 <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7061804> accessed 5 October 2019.

[13] See in general: Cathy O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (Crown Publishing Group 2016).

[14] Andrew Hope, 'Governmentality and the 'Selling' of School Surveillance Devices' (2015) 63(4) The Sociological Review 840 <https://doi.org/10.1111/1467-954X.12279> accessed 5 October 2019.

[15] Diana Walsh, James Parisi and Katia Passerini, 'Privacy as a Right or as a Commodity in the Online World: The Limits of Regulatory Reform and Self-Regulation' (2017) 17(2) Electronic Commerce Research 185, 188 <https://doi.org/10.1007/s10660-015-9187-2> accessed 5 October 2019.

[16] Esther Keymolen and Simone van der Hof, 'Can I Still Trust You, My Dear Doll? A Philosophical and Legal Exploration of Smart Toys and Trust' (2019) Journal of Cyber Policy 1, 9 <https://doi.org/10.1080/23738871.2019.1586970> accessed 5 October 2019.

[17] Andrew Banfield and Rainer Knopff, 'Legislative versus Judicial Checks and Balances: Comparing Rights Policies Across Regimes' (2009) 44(1) Australian Journal of Political Science 13, 24-25 <https://doi.org/10.1080/10361140802654968> accessed 5 October 2019; Fabio Padovano, Grazia Sgarra and Nadia Fiorino, 'Judicial Branch, Checks and Balances and Political Accountability' (2003) 14(1) Constitutional Political Economy 47, 49 <https://doi.org/10.1023/A:1022347908667> accessed 5 October 2019; Eyal Benvenisti and George Downs, 'Toward Global Checks and Balances' (2009) 20(3-4) Constitutional Political Economy 366 <https://doi.org/10.1007/s10602-008-9071-3> accessed 5 October 2019.

[18] David Robinson and Logan Koepke, *Stuck in a Pattern: Early Evidence on "Predictive Policing" and Civil Rights* (Upturn 2016) 2ff <https://www.upturn.org/reports/2016/stuck-in-a-pattern/> accessed 5 October 2019.

[19] Fan Liang and others, 'Constructing a Data-Driven Society: China's Social Credit System as a State Surveillance Infrastructure' (2018) 10(4) Policy and Internet 415, 418 <https://doi.org/10.1002/poi3.183> accessed 5 October 2019; Sue Newell and Marco Marabelli, 'Strategic Opportunities (and Challenges) of Algorithmic Decision-Making: A Call for Action on the Long-Term Societal Effects of 'Datafication'' (2015) 24(1) The Journal of Strategic Information Systems 3, 7 <https://doi.org/10.1016/j.jsis.2015.02.001> accessed 5 October 2019; Joshua

evaluate the accused before sentencing courts[20] and, in general, make decisions on issues previously decided on by public actors. In such situations, private models process input data and deliver an output; what happens between input and output may be opaque and unintelligible.

Safeguards provided for by law, concerning principles of data processing, may ensure high standards. Namely, legal provisions, introduced to ensure accountability, require that data controllers, ie those who determine the purposes and means of data processing, should comply with principles of such processing and be bound by a number of duties.[21] However, such controllers can be private actors, not subjected to public mechanisms of checks and balances. Therefore, there is no guarantee that decisions, public actors delegate to private data driven technologies, serve the best interests of the people.

Addressing the judge, as a public authority and a fiduciary, this thesis aims to answer the following question(s):

Key Research Question:

How could a system of checks and balances be introduced to ensure that decisions sentencing courts delegate to private data driven technologies serve the best interests of the people?

Sub-questions:

- To what extent can decisions sentencing courts delegate to private data driven technologies affect individuals?

- How could the treatment of data driven decision-making sentencing courts delegate to private technologies as exercise of authority justify the application of fiduciary laws?

- How could the fiduciary concept make such data driven decision-making serve the best interests of the people?

§I.2. State of the Art, Clarifications and Importance

The fiduciary notion entails the core duty of loyalty; a party, entrusted with or managing another's right, has a duty to act in the interests of that other party. The fiduciary concept exists in national laws of all European Member States.[22] Yet not much European literature has been devoted to that concept in particular connection with relationships emerging in the era of Big Data. In contrast, American scholars have been discussing the fiduciary as a good fit for the regulation of such relationships.[23] Thus far proposals have been mainly based on the idea that people trust private actors with their data. Hence, prior work has suggested that these private

---

Kroll and others, 'Accountable Algorithms' (2017) 165 University of Pennsylvania Law Review 633, 636 <https://scholarship.law.upenn.edu/penn_law_review/vol165/iss3/3/> accessed 5 October 2019.

[20] Harvard Law Review, '*State v. Loomis*: Wisconsin Supreme Court Requires Warning Before Use of Algorithmic Risk Assessments in Sentencing' (2017) 130(5) Harvard Law Review 1530 <https://harvardlawreview.org/2017/03/state-v-loomis/> accessed 5 October 2019.

[21] Simone Fischer-Hübner and others, 'Online Privacy – Towards Informational Self-Determination on the Internet' in Mireille Hildebrandt, Kieron O'Hara and Michael Waidner (eds), *Digital Enlightenment Yearbook 2013: The Value of Personal Data* (IOS Press 2013) 123, 134 <https://ebookcentral.proquest.com/lib/uvtilburg-ebooks/reader.action?docID=1477323&ppg=142> accessed 5 October 2019.

[22] Eric Mugnier and others, *Resource Efficiency and Fiduciary Duties of Investors* (Final Report ENV.F.1/ETU/2014/0002 DG Environment, European Commission 2014) 8 <http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/FiduciaryDuties.pdf> accessed 5 October 2019.

[23] See, generally: Jack Balkin, 'Information Fiduciaries and the First Amendment' (2016) 49(4) UC Davis Law Review 1183 <https://lawreview.law.ucdavis.edu/issues/49/4/Lecture/49-4_Balkin.pdf> accessed 5 October 2019; Neil Richards and Woodrow Hartzog, 'Taking Trust Seriously in Privacy Law' (2016) 19 Stanford Technology Law Review 431 <http://dx.doi.org/10.2139/ssrn.2655719> accessed 5 October 2019.

actors, processing entrusted data, should have a duty to act in the best interests of the data subjects.

Contrary to earlier studies, this thesis addresses the fiduciary concept in relation to public actors and, in particular, the judge. It regards the fiduciary as a flexible notion that can govern relationships where authority exercised can peculiarly affect the important interests of another, who becomes particularly 'vulnerable to or at the mercy of' that authority.[24] This approach suggests that novel fiduciary relationships may arise to guarantee fairness, where new vulnerabilities emerge. From this perspective, states have been discussed as fiduciaries of humanity, the environment or future generations.[25] According to this view, where many beneficiaries are subjected to the same authority, the duty of loyalty becomes a duty of reasonableness and fairness; the fiduciary has to justify the decision-making (duty of reasonableness) and provide all necessary safeguards demanded by procedural fairness (duty of fairness).[26] Here, trust is presumed, not conferred.[27]

Narrowing down its scope, the thesis examines only situations where decisions the judge delegates to private data driven models have a major impact on individuals. More precisely, it studies solely the case where sentencing courts delegate the decision on the evaluation of the accused. Were there no data driven model, the judge would examine facts and evidence, determine the risk of reoffending and, in general, perform all reasoning necessary to evaluate the defendant and decide on the case. However, private data driven models can now be used to do tasks and assessments previously performed by judges. In these cases, data driven decision-making becomes necessary part of evidence brought before court, of due process and of the judicial decision-making. For the judge, herself, would evaluate the accused, were there no private model. Therefore, data driven decision-making, though not subject to public mechanisms, becomes an indispensable part of the public authority exercised by the judge, who orders the judgment and, eg, deprives the accused of his liberty.

Addressing such situations where people are seriously affected, this thesis aims to contribute to existing literature by justifying the application of fiduciary laws on the basis of the authority notion and the rule of law. It stresses that neither humans nor data driven models are capable of reaching a general intelligence.[28] Both seem imperfect. If there were a way to address opaque, unintelligible and biased data driven decision-making, this could be a way similar to how non-transparent, inexplicable and partial human mind reaches optimal rationality. It is suggested that such approach could be based on how the judge, who is

---

[24] Himmy Lui, 'A Fiduciary Perspective on the State's Duty to Protect the Environment' (2014) 20 Auckland University Law Review 101, 105 <https://heinonline.org/HOL/P?h=hein.journals/auck20&i=99> accessed 5 October 2019.

[25] Evan Criddle and Evan Fox-Decent, *Fiduciaries of Humanity: How International Law Constitutes Authority* (Oxford University Press 2016) 283, 288 <http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199397921.001.0001/acprof-9780199397921> accessed 5 October 2019; Peter Brown, 'Climate Change and the Planetary Trust' (1992) 20(3) Energy Policy 208, 214 <https://doi.org/10.1016/0301-4215(92)90079-H> accessed 5 October 2019.

[26] Evan Criddle and Evan Fox-Decent, 'A Fiduciary Theory of Jus Cogens' (2009) 34(2) Yale Journal of International Law 331, 350 <http://digitalcommons.law.yale.edu/yjil/vol34/iss2/3> accessed 5 October 2019; Evan Fox-Decent, 'The Fiduciary Nature of State Legal Authority' (2005) 31(1) Queen's Law Journal 259, 264, 267ff <https://heinonline.org/HOL/P?h=hein.journals/queen31&i=271> accessed 5 October 2019.

[27] Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (2013) 101(3) California Law Review 699, 707 <https://doi.org/10.15779/Z38N529> accessed 5 October 2019; Evan Fox-Decent, 'The Fiduciary Nature of State Legal Authority' (n 26) 294.

[28] Nick Bostrom and Eliezer Yudkowsky, 'The Ethics of Artificial Intelligence' in Keith Frankish and William Ramsey (eds), *The Cambridge Handbook of Artificial Intelligence* (Cambridge University Press 2014) 316, 318 <https://doi.org/10.1017/CBO9781139046855.020> accessed 5 October 2019.

demanded to be impartial, achieves optimal rationality by sufficiently justifying decision-making and by complying with procedural fairness. This way of reaching optimal results corresponds to the fiduciary duties of reasonableness and fairness.

Literature has addressed the concept of providing interpretations to justify opaque data driven decision-making; yet so far suggestions, like post-hoc interpretations, are of technical nature.[29] The thesis aims to go beyond technical aspects and argue for a mandatory scheme, where the provision of explanations would not be left to the discretion of private actors. Where data driven decision-making becomes indispensable part of exercising public authority and seriously affects individuals, it could or should be subjected to mechanisms that would ensure that data driven decisions serve the best interests of the people.

Concerning these 'best interests of the people', the thesis sees the 'people' as those potentially subjected to and affected by the authority of the judge. These people can be defendants (eg, where a judge deprives the accused of her liberty); they can be non-litigants (eg, by convicting one sexually exploiting minors, the judge protects children in general); or they can be non-members of the citizenry (eg, a decision of a Greek court on maintenance payments can have material impact on the beneficiary of these payments, who may be a Dutch citizen). The 'best' interests are perceived in an optimal sense as the interests served by the judge whose decision-making is justifiable, open to public scrutiny and delivered via due and fair processes.

A final clarification refers to data controllers and personal data processing. The thesis aims to conceptualise the judge as a public fiduciary bound by the duty to review reasonableness and fairness of data driven decision-making; after review, the judge can either approve or deny the use of the model –meaning the application of the outcome of the data driven decision-making to the case at hand. The suggested review follows and does not influence the determination of the purposes and means of the processing of potentially personal data. The thesis presumes that the judge dealing with a particular case is not involved in the determination of the why and how of the processing, whose purposes and means have already been (and are still being) determined by an actor other than the judge. The research addresses the judge as a potential public fiduciary, not as a data controller. Where references are made to data controllers, they are understood as private entities.

More precisely, data driven decision-making, when entailing personal data processing, makes personal data protection laws relevant. The data controller is understood under the European regime as the person defining the purposes and the means of the processing.[30] In the context of criminal justice, it can choose to gather specific data and analyse them on the basis of peculiar risk factors for the purpose of evaluating the accused. The controller can hence be a private entity (eg, directing the technology to sentencing courts), the court (eg, developing a model to evaluate defendants) or both the court and a private actor, as joint controllers.[31] For its purposes, the thesis addresses solely the first scenario, where the controller is a private entity (still, the focus remains on the judge, not the controller).

Moreover, if processing for the purpose of evaluating the accused were seen as processing for the purpose of preventing offences or executing penalties, it could fall within the scope of

---

[29] Zachary Lipton, 'The Mythos of Model Interpretability' (2018) 16(3) ACM Queue - Machine Learning <https://dl.acm.org/citation.cfm?id=3236386.3241340> accessed 5 October 2019.

[30] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC [2016] OJ L119/1 (General Data Protection Regulation), art 4(7).

[31] General Data Protection Regulation, art 26.

the Data Protection Directive for Police and Criminal Justice Authorities.[32] This Directive applies to public authorities, as well as private entities performing public functions.[33] It introduces a police and justice authorities-friendly scheme, where, in the name of flexibility, the principle of transparency seems absent,[34] the principles of data minimisation and purpose limitation become flexibly applied and, therefore, seriously affected[35] and the data subjects' rights are limited.[36]

On the other hand, if processing to evaluate the accused did not fall within the scope of the Directive, the General Data Protection Regulation could apply.[37] This is most probably the case, since the distinguishing line between the evaluation of the defendant and the prevention of offences or the execution (not imposition) of penalties seems clear. It would be fair to argue that crime prevention, though related to the use of data driven technologies in the criminal justice system, is not the purpose of personal data processing (this being the evaluation of the accused).[38] In light of the above considerations, when discussing personal data controllers and processing, the thesis refers to the provisions of the General Data Protection Regulation, which are in any case more stringent than those of the Data Protection Directive for Police and Criminal Justice Authorities.

§I.3. Methodology, Methods and Overview of Chapters

The thesis mainly follows a conceptual methodology entailing both legal and philosophical analysis, as well as research in fields of social and political sciences. An interdisciplinary approach is adopted as a necessary means to gain a well-informed view on particular issues, new forms of AI for example. While the primary sources used are books, journal articles and contributions to edited books, additional sources, such as reports, conference papers, legislation, dictionaries, encyclopaedias or working papers, were also studied. The Tilburg University Library and the library of the University of Amsterdam (physical and digital) were the main search-instruments; albeit, publicly available (online) search-tools, such as websites of institutions, were also used.

For the sake of honesty and transparency, it is noted that this thesis is part of the author's extensive research on fiduciaries, authorities and data driven decision-making. This background can explain particular choices made during the inquiry; eg, why publications on the Latin 'auctoritas' or 'fides' were deemed necessary to link fiduciary to authority. Furthermore, to respect the value of objectivity and inform readers interested in repeating steps taken, it is added that no particular database-dependent search was conducted. Rather, the author followed a

---

[32] Directive (EU) 2016/680 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHA [2016] OJ L119/89 (Data Protection Directive for Police and Criminal Justice Authorities), arts 1-2.

[33] Data Protection Directive for Police and Criminal Justice Authorities, art 3(7); European Union Agency for Fundamental Rights and Council of Europe, *Handbook on European Data Protection Law* (2018 edn, European Union Agency for Fundamental Rights and Council of Europe 2018) 282.

[34] Data Protection Directive for Police and Criminal Justice Authorities, art 4(1)(a).

[35] Data Protection Directive for Police and Criminal Justice Authorities, art 4(1)(b-c).

[36] For an analysis, see: European Union Agency for Fundamental Rights and Council of Europe, *Handbook on European Data Protection Law* (n 33) 283-286.

[37] Data Protection Directive for Police and Criminal Justice Authorities, Recital (11) and art 9; European Union Agency for Fundamental Rights and Council of Europe, *Handbook on European Data Protection Law* (n 33) 282.

[38] It is noted that the Data Protection Directive for Police and Criminal Justice Authorities seems hesitant to subject courts, when exercising judicial authority, to its provisions. For example, Article 45(2) of this Directive expressly denies competence of supervisory authorities.

general ('all databases') and keyword-based quest via the universities' instruments or publicly available tools. Where necessary, filters related to, eg, authors or publication-year were used.

To further support the core values of honesty, transparency and objectivity this research relies upon,[39] in what follows, the 'why and how' of the overall inquiry is analytically explained. For reasons of clarification, when referring to publications, texts or sources, the following part of this section means the fore-mentioned primary sources, unless otherwise specified; and, when using terms or phrases in 'quotation marks', the relevant parts of the text of this section refer to search-terms. As the discussion below demonstrates, each chapter's specific purpose justifies the methodologies and methods chosen.

Chapter II addresses the first sub-question; that is, it aims to assess the impact that data driven decision-making on the evaluation of the accused can have on individuals. This demanded two separate searches: one quest for recent sources describing technical aspects and uses of contemporary data driven technologies; and another quest for texts discussing the task of the evaluation of the defendant prior to delegation (when performed by human judges), as well as after delegation (when carried out by technologies).

The first inquiry was targeted at exploring and understanding the bigness of Big Data in terms of size of datasets and sophistication of analysis, but also at investigating potential achievements and possible risks. The searching-exercise was carried out via keywords manifesting Big Data's key functions (eg, 'predictive' or 'data driven'), their promises and their side-effects (eg, 'efficiency' versus 'unintelligibility'). To examine the extent to which unwanted risks identified can be amplified by new forms of AI, further search was conducted by combining drawbacks-related keywords with terms referring to the modus operandi of such AI (eg, 'deep'/'machine learning', 'biased dataset' or 'representativeness'). In most of the cases, results were filtered to focus on publications reflecting relatively recent (post-2007/2008) technological advancements. In addition to primary sources, conference papers were returned by this filtering; among sources returned, academic texts from fields of law, philosophy and/or technology were selected.

Furthermore, the task of evaluating the accused was studied via the perusal of publications on theoretical dimensions of sentencing and punishment, in conjunction with sources related to risk-prediction and the presence (or absence) of human reasoning. General theories of 'incapacitation', 'rehabilitation' or 'deterrence' were examined in combination with specific terms, such as 'pre-emption', 'risk', 'prevention', 'actuarial', 'evidence-based' or 'professional judgements'. Temporal (and jurisdictional) filters were avoided, since the aim was to study, in general, humanmade and data driven decision-making, as well as normative approaches to the task of evaluating the accused. Primary sources, reports and online texts mainly from the field of criminal law were chosen.

The first inquiry was imperative to assess opportunities and limitations attributed to Big Data. Although a (mainly) descriptive analysis does not make a concrete contribution to existing literature, this assessment provides for an interdisciplinary approach to data driven decision-making. This offers readers, who may be unfamiliar with Big Data environments, insights necessary for comprehending contemporary vulnerabilities. Moreover, by combining fields of

---

[39] While honesty, transparency and impartiality/objectivity are seen as the key values of this research, the thesis also complies with other important values, such as accountability (entailing adequate explanations) or fairness satisfied by acknowledging persons whose writings contributed to the author's development (see 'PREFACE' of the thesis). For research values, see in general: National Academies of Sciences, Engineering, and Medicine, *Fostering Integrity in Research* (The National Academies Press 2017) 29-38 <https://doi.org/10.17226/21896> accessed 5 October 2019.

law, philosophy and technology, the interdisciplinary approach highlights elements, such as bias, that humanmade and data driven decisions can share. These similarities, further supported by the second inquiry's criminal law-material, allowed for the demonstration that (same as technologies) judges rely on evidence/data and can, thus, make 'evidence-based' judgments –a term often associated with actuarial tools. Lastly, the second inquiry, limited neither by time-nor by jurisdiction-filters, linked pre-emption to criminal law-related strategies of the previous century.

To sum up, Chapter II's inquiries were imperative to highlight that which data driven decision-making on the evaluation of the accused introduced. This is not complete depart from humanmade decisions; it is neither absolute accuracy nor pre-emption. Rather, it is amplified opacity and unintelligibility that can seriously affect the people.

Chapter III is aimed at answering the second sub-question; that is, at addressing the treatment of data driven decision-making on the evaluation of the accused as exercise of judicial authority and the justification of the application of fiduciary laws on the basis of this treatment. The author's background on fiduciaries and authorities suggested three separate inquiries directed to the identification of the features of impact, trust, expertise, reasonableness and fairness in exercises of public authority. The logic behind the three inquiries was to apply these (fiduciary- and authority-related) features to data driven decision-making, make such decision-making qualify as exercise of public authority and justify the application of fiduciary laws on the grounds of this qualification.

The first inquiry explored the development of impact and trust in the public authority-people relation. Searching for the ancient roots of authority (ie, the Latin 'auctoritas') provided texts from classical studies establishing strong links between trust and public power. Trust-related inquiries, adapted to more recent 'legitimate' or 'coercive' exercises of power, returned primary sources and research papers from social and political sciences discussing power as the capacity to affect and authority as power legitimised. Time-, jurisdiction- and author-filters were often used to limit results to European and American literature of the mid- and late-twentieth century. These sources were absolutely necessary to offer a comprehensive view on the evolution of impact and trust in the public authority-people relation and focus on aspects of the rule of law, such as 'predictability' or 'openness', in modern contexts.

Despite the first inquiry's valuable contribution to offering clear and precise responses to issues raised by the second sub-question, it is noted that, by focusing on authority (not coercion) and trust-enhancing (not trust-diminishing) factors, selected methods and methodologies did not allow the author to investigate how the data driven decision-making in question could be at risk of entailing coercive forms of power involving, eg, suspicion or mistrust. This investigation could, perhaps, capture the impact of such decision-making on the people. This is an approach that the author aims to explore in the future.

The second inquiry investigated trust in contemporary 'expert' ('epistemic') authorities. With the objective of discussing 'transparency', 'reason-giving', 'reputation' and other trust-enhancing factors in real-life examples (ie, expert testimonies in courtrooms), the inquiry was directed to relatively recent texts from social and political sciences (mainly post-2000 journal articles), as well as online sources (eg, updated guides of the European Court of Human Rights). Even though the example of expert testimonies involves private authorities (falling outside the scope of this thesis), reference to such authorities was deemed necessary to stress or better comprehend and communicate the meaning of 'expertise' and the reason for justifying decisions in the context of exercising judicial authority –but also to support the approach of the potential culture of reason-giving in the concluding chapter V.

The third inquiry, addressing reasonableness and fairness, was aimed at drawing insights into the judge's quest for optimal rationality. Primary sources from the field of law were mainly selected. Time-filters in searches for 'due process', 'stare decisis', 'independence' or 'impartiality' were necessary to focus on recent (post-2000) and older (eg, nineteen-seventies) publications on fundamental legal principles governing judicial decision-making. Texts from social and political sciences and publications on philosophical aspects of reasoning were also advised to capture limitations of human decision-making. These sources were of utmost importance to support the judge-approach to data driven decision-making.

Despite its significance for the purposes and main argument of this research, the third inquiry was limited in the sense that it did not extensively explore all aspects of the judiciary vis-à-vis approaches to the rule of law, other than those addressed by chapter III. For instance, judges have been treated as 'instruments of law' who 'can will nothing' and have been denied (or have denied themselves) discretionary powers.[40] This view could support the argument for an executant judge and direct the research toward findings running counter to chapter III's claim on the judge, who can be given discretion to seek for fundamental principles (eg, where laws seem inapplicable). Still, it is noted that the inquiry did, to the extent possible, consider both sides of the coin. For example, particular reference is made to the judge who justifies decisions to prove compliance with the law (rather than her skills). Such and similar references can reveal the research's efforts to strike a fair balance and argue for the independent (discretionary, but not arbitrary) judge, who complies with (yet does not mechanically apply) the law.

In any event, the three inquiries of chapter III enabled the author to apply the elements of exercises of judicial authority that can affect the people, be presumed to be trusted and reach optimal reasonableness and fairness to data driven decision-making on the evaluation of the accused. They, then, allowed to justify the application of fiduciary laws on the grounds of the qualification of such data driven decision-making as exercise of judicial authority, which (exercise) already satisfies key fiduciary standards (discussed in chapter IV).

Chapter IV addresses the third sub-question; it is aimed at investigating the fiduciary concept's potential for making data driven decision-making on the evaluation of the accused at the service of the best interests of (the people, ie) those potentially subjected to and affected by the authority of the judge; that is, for making such decision-making justifiable, open to public scrutiny and delivered via due and fair processes. A two-step inquiry was conducted to, first, link public authorities to fiduciaries and, second, apply the fiduciary conceptualisation of the judge to data driven contexts.

In the first phase, the inquiry searched for the roots of the fiduciary ('fides'). Facilitated by insights from 'auctoritas', the research examined texts from religious, classical or human studies placing 'trust' and 'loyalty' at the heart of the fiduciary. On trust, its connection with 'vulnerability', 'uncertainty' or 'opacity' and its emergence in asymmetric (eg, state-citizens) relations were stressed after studying publications from, among others, economics, philosophy and political science. On loyalty, the inquiry relied upon basic fiduciary indicia ('authority', 'impact' and 'vulnerability') and combined terms, such as 'other-regarding' or 'even-handedness', to focus on one-to-many (eg, public authority-people) relations. Publications mainly from law, philosophy and political theory enabled the author to argue for 'reasonableness', 'fairness' and 'trust' as key elements shared by public authorities and fiduciaries involved in one-to-many relations. This first step was necessary to establish the

---

[40] Chief Justice Marshall as cited in: Brian Tamanaha, *On the Rule of Law: History, Politics, Theory* (Cambridge University Press 2004) 63-64.

appropriate authority-fiduciary connection. Yet it did not examine the role that other fiduciary duties (eg, the duty of care) could play in such relations (this task is left for future research).

In the second phase, the inquiry explored constitutive elements of various fiduciary relationships by combining keywords, like 'trustee/identifiability/beneficiary', 'public authority/public trust' or 'contract law/delegation'. Publications on fiduciary laws enabled the author to argue for the fiduciary conceptualisation of the judge and its significance for the authority notion. Furthermore, the perusal of legal provisions on data controllers and academic literature, mainly from fields of law, on gaps between existing laws and technologies was imperative to substantiate the necessity of the application of this fiduciary conceptualisation to data driven decisions. Here, it could be argued that the conceptual approach to the identification of fiduciaries (eg, looking for keywords in literature, rather than relationships in caselaw) disregards jurisdictional perspectives. However, it must be borne in mind that only via such an approach could the thesis support proposals that can overcome (and be applied uniformly to contemporary criminal justice systems irrespectively of) any divergencies, like those between common law and civil law regimes.

To sum up, chapter IV's two-step inquiry offered insights necessary to argue for a review that combines elements of the public authority and the fiduciary and draws inspiration from the idea of having tests (eg, to check 'rationality' or minimise 'identifiable bias') with the ultimate goal of making data driven decision-making on the evaluation of the accused contestable, open, due and fair, as well as justifiable.

Aside from the above step-by-step analysis, the overall inquiry was targeted at the fiduciary judge. Methods and methodologies resulted in or dictated a human-approach to data driven decision-making; a perspective that is, perhaps by necessity, accompanied by erring. Moreover, aimed at the judiciary, the general inquiry did not address difficulties inherent in judicial decision-making and procedures, such as legal uncertainty resulting from deciding on cases on the basis of their peculiar facts, rather than objective criteria or well-established principles.[41] However, this thesis seeks for optimal results, not perfection. It aims to let uncertainty in and, to the extent possible, minimise it, not set it aside; and the well-established, institutionalised and (to the author) fiduciary judge can minimise uncertainties, even those attributed to her (or the court's) very nature. Methods and methodologies chosen were absolutely necessary to argue for such working with uncertainty. Despite its imperfection (or because of it), this working with uncertainty can be seen as the crux of the research's originality –provided that there could be such an originality.

In light of all the foregoing analytical justifications and detailed clarifications, especially regarding each chapter's contribution and purpose, the key research question and sub-questions of the thesis could be rephrased as follows:

Key Research Question:

How could a system of checks and balances be introduced to ensure that data driven decisions on the evaluation of the accused are justifiable, open to public scrutiny and delivered via due and fair processes?

Sub-questions:

- To what extent can data driven decisions on the evaluation of the accused affect individuals?

---

[41] Bart van der Sloot, 'The Practical and Theoretical Problems with 'Balancing': *Delfi*, *Coty* and the Redundancy of the Human Rights Framework' (2016) 23(3) Maastricht Journal of European and Comparative Law 439, 448 <https://doi.org/10.1177/1023263X1602300304> accessed 5 October 2019.

- How could the treatment of data driven decision-making on the evaluation of the accused as exercise of judicial authority justify the application of fiduciary laws?

- How could the fiduciary concept make data driven decision-making on the evaluation of the accused justifiable, open to public scrutiny and delivered via due and fair processes?

Such a rephrasing can better capture the particular object of this thesis; that is, data driven decision-making on the evaluation of the accused (rather than, in general, decision-making 'sentencing courts delegate to private data driven technologies'). Importantly, it can avoid the use of vague terms ('best interests of the people') and explain the desirable outcome or goal of the potential introduction of a mechanism of checks and balances; ie, to make data driven decisions on the evaluation of the accused justifiable, open to public scrutiny and delivered through due and fair processes. Therefore, questions rephrased can reflect more accurately the subject-matter of the research; what this research mainly deals with.

However, the terms/phrases 'decision-making sentencing courts delegate to private data driven technologies' and 'best interests of the people' are used throughout the thesis for three reasons. First, the author wishes to draw attention to the element of 'delegation' that has a vital role in every step of the inquiry. Second, 'the people' must be emphasised and seen as the ultimate beneficiaries of proposals recommended by the research; those potentially subjected to or affected by the judicial authority should (as chapter IV suggests) become well-informed about the involvement of private data driven technologies in sentencing. The third reason is brevity; at least, with regard to the requirement that data driven decisions 'serve the best interests' (versus being 'justifiable, open to public scrutiny and delivered via due and fair processes'), as well as 'the people' (versus 'those potentially subjected to and affected by the authority of the judge').

Having analytically explained the inquiry and clearly specified its subject-matter, the thesis organises its chapters as follows:

Chapter I introduced the background and context of the research. It explained the problem it addresses and the research question(s) it aims to answer. It also discussed the relevant state of the art, made necessary clarifications and justified the methods and methodologies.

Chapter II aims to determine how seriously decisions sentencing courts delegate to private data driven technologies can affect individuals. Against the background of Big Data, it examines how valuable and, simultaneously, exploitative data driven decision-making can become. References to contemporary technologies used in criminal justice are made to highlight ways in which new forms of AI can magnify unwanted risks of Big Data.

Chapter III aims to examine how the treatment of data driven decision-making sentencing courts delegate to private technologies as exercise of authority could justify the application of fiduciary laws. It discusses the notion of authority and the concept of the rule of law in particular relation to the judge, the optimally rational decisionmaker. The application of the features of authority to technologies used in sentencing courts suggests that data driven decision-making can qualify as exercise of judicial authority; this qualification can justify the application of fiduciary laws.

Chapter IV aims to address how the fiduciary concept could make data driven decisions sentencing courts delegate to private technologies serve the best interests of the people. After discussing fides and its link to trust and loyalty, it analyses fiduciary duties and argues for their potential extension to public actors. Finding that, like a judge, a fiduciary involved in one-to-many relations is bound by the duty of reasonableness and fairness, the chapter investigates what the 'fiduciarisation', ie the fiduciary conception, of the judge can add to so far known requirements of the authority notion and the concept of the rule of law. It proposes a review of

reasonableness and fairness to transform theoretical aspects of the rule of law and the authority notion into actual fiduciary duties that would make data driven decisions serve the best interests of the people.

Chapter V summarises the research and discusses its findings and its limitations.

II. HOW 'BIG' HAS DATA DRIVEN DECISION-MAKING BECOME?

§II.1. Introduction

Technology can destroy humanity;[42] but it can also cure people.[43] It can determine who individuals may become or where they may be, in powerful or powerless positions.[44] Technology can, therefore, have an impact on people's lives; and this is not something new.

Back in the mid nineteen-seventies, authors became worried about prioritisation of technologies over people. Places, where children used to play, were transformed into parking lots; cars were emphasised over children.[45] Technology's impact became more apparent, when low overpasses prevented minorities from reaching particular places. After having granted the right to park, technology, as authority-exercising, offered cars the privilege of passing through low bridges and the monopoly on accessing areas beyond.[46] Poor groups, using tall buses, were deprived of entering such areas.[47]

This deprivation of rights or opportunities demands that someone should take responsibility, when technology is used to deny or mistreat. Yet, as the old story of Frankenstein suggests, technology designers or developers tend to hide and escape responsibility when their creations turn out to be unwanted, when events take a serious turn for the worse.[48] In an era when technologies are used, not just to decide on parking-lot-related issues but also, by courts to impose sentences that seriously affect the alleged infringers and their lives, there is a pressing need to address responsibility and take technology's 'seriousness seriously'.[49]

Responsibility-related issues are examined in later chapters of this thesis. This chapter focuses on technology's seriousness. It aims to examine how seriously decisions, sentencing courts delegate to private data driven models, can affect individuals.

§II.2. Big Data Driven Predictions

Over the last decades, particular attention has been drawn to semantics,[50] the meaning of data.[51] Efforts are aimed at attributing meaning to data.[52] In the new era of ever-growing data,

---

[42] Bernard Stiegler, *Technics and Time, 1: The fault of Prometheus* (Stanford University Press 1998) 87.

[43] Asle Kiran and Peter-Paul Verbeek, 'Trusting Our Selves to Technology' (2010) 23(3-4) Knowledge, Technology & Policy 409, 412ff <https://doi.org/10.1007/s12130-010-9123-7> accessed 5 October 2019.

[44] Andy Clark, *Natural-Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence* (Oxford University Press 2003) 150.

[45] Ronald Horvath, 'Machine Space' (1974) 64(2) The Geographical Review 167, 168ff, 179.

[46] Langdon Winner, 'Do Artifacts Have Politics?' (1980) 109(1) Daedalus 121, 124ff.

[47] Langdon Winner, 'Do Artifacts Have Politics?' (n 46) 124.

[48] Cees Hamelink, *The Ethics of Cyberspace* (SAGE Publications 2000) 6.

[49] Rob Sparrow, 'Can Machines Be People? Reflections on the Turing Triage Test' in Patrick Lin, Keith Abney and George Bekey (eds), *Robot Ethics: The Ethical and Social Implications of Robotics* (MIT Press 2012) 301.

[50] Tim Berners-Lee, James Hendler and Ora Lassila, 'The Semantic Web' (2001) 284(5) Scientific American 34; James Hendler, 'Agents and the Semantic Web' (2001) 16(2) IEEE Intelligent Systems 30 <https://ieeexplore.ieee.org/document/920597> accessed 5 October 2019.

[51] Giorgio Marchetti, 'Consciousness: A Unique Way of Processing Information' (2018) 19(3) Cognitive Processing 435, 441 <https://doi.org/10.1007/s10339-018-0855-8> accessed 5 October 2019.

[52] Morales del Castillo and others, 'Recommending Biomedical Resources: A Fuzzy Linguistic Approach Based on Semantic Web' (2010) 25(12) International Journal of Intelligent Systems 1143, 1145 <https://doi.org/10.1002/int.20447> accessed 5 October 2019; Bujar Raufi and others, 'Knowledgebase Harvesting for User-Adaptive Systems Through Focused Crawling and Semantic Web' (17th International Conference on Computer Systems and Technologies, Palermo, June 2016) 323, 324 <https://dl.acm.org/citation.cfm?id=2983510> accessed 5 October 2019.

this attribution of meaning may have both positive and negative outcomes. Data subjects may benefit from as well as be exploited by benevolent or malicious Big Data.[53]

Big Data can be seen as a phenomenon that involves accumulation and processing of massive amounts of data.[54] Contemporary models can analyse gargantuan datasets to detect patterns and make estimates.[55] To some, the concept of Big Data is not new. Data have always –and everywhere– been big;[56] for humans have always aimed to scrutinise anything in the physical offline world,[57] the 'techno-sphere' or the 'data-logy' of the mid-twentieth century[58] and in more recent data-centres.[59] However, it seems that, today, data have become even bigger, capable of being collected from almost everywhere, processed even faster and, importantly, analysed in new complex ways.[60] Therefore, the concept of Big Data is not only (or is not that much) about the bigness of data.[61] It is also (or it is more) about how data can be processed and analysed.[62]

---

[53] Annika Richterich, *The Big Data Agenda: Data Ethics and Critical Data Studies* (University of Westminster Press 2018) 12 <https://www.jstor.org/stable/j.ctv5vddsw.3> accessed 5 October 2019; Frank Pasquale, 'Grand Bargains for Big Data: The Emerging Law of Health Information' (2013) 72(3) Maryland Law Review 682, 684.

[54] Xuemei Tian and Libo Liu, 'Does Big Data Mean Big Knowledge? Integration of Big Data Analysis and Conceptual Model for Social Commerce Research' (2017) 17(1) Electronic Commerce Research 169, 171 <https://doi.org/10.1007/s10660-016-9242-7> accessed 5 October 2019; Wendy Arianne Günther and others, 'Debating Big Data: A Literature Review on Realizing Value from Big Data' (2017) 26(3) The Journal of Strategic Information Systems 191 <https://doi.org/10.1016/j.jsis.2017.07.003> accessed 5 October 2019; Anton Vedder and Laurens Naudts, 'Accountability for the Use of Algorithms in a Big Data Environment' (2017) 31(2) International Review of Law, Computers & Technology 206 <https://doi.org/10.1080/13600869.2017.1298547> accessed 5 October 2019.

[55] danah boyd and Kate Crawford, 'Critical Questions for Big Data: Provocations for a Cultural, Technological, and Scholarly Phenomenon' (2012) 15(5) Communication & Society 662, 663 <https://doi.org/10.1080/1369118X.2012.678878> accessed 5 October 2019; Peter Burgess and others, *Ethics Advisory Group Report 2018: Towards a Digital Ethics* (EDPS Ethics Advisory Group, European Union 2018) 7 <https://edps.europa.eu/sites/edp/files/publication/18-01-25_eag_report_en.pdf> accessed 5 October 2019.

[56] Mark Andrejevic, 'The Big Data Divide' (2014) 8 International Journal of Communication 1673, 1675 <https://ijoc.org/index.php/ijoc/article/view/2161/1163> accessed 5 October 2019.

[57] John Sinclair, 'Advertising and Media in the Age of the Algorithm' (2016) 10 International Journal of Communication 3522, 3528.

[58] Luis Bruni, 'Sustainability, Cognitive Technologies and the Digital Semiosphere' (2015) 18(1) International Journal of Cultural Studies 103, 104ff <https://doi.org/10.1177/1367877914528121> accessed 5 October 2019; Annika Richterich, *The Big Data Agenda* (n 53) 5.

[59] Cory Doctorow, 'Big Data: Welcome to the Petacentre' (2008) 455 Nature 16 <https://www.nature.com/news/2008/080903/full/455016a.html> accessed 5 October 2019.

[60] João Canito and others, 'Unfolding the Relations between Companies and Technologies under the Big Data Umbrella' (2018) 99 Computers in Industry 1, 2 <https://doi.org/10.1016/j.compind.2018.03.018> accessed 5 October 2019; Zaheer Khan and Tim Vorley, 'Big Data Text Analytics: An Enabler of Knowledge Management' (2017) 21(1) Journal of Knowledge Management 18, 20 <https://doi.org/10.1108/JKM-06-2015-0238> accessed 5 October 2019.

[61] Pam Baker, *Data Divination: Big Data Strategies* (Cengage Learning PTR 2014) 2; Adrienne Cobb and others, 'Big Data: More than Big Data Sets' (2018) 164(4) Surgery 640 <https://doi.org/10.1016/j.surg.2018.06.022> accessed 5 October 2019.

[62] Gary King, 'Preface: Big Data Is Not About the Data!' in Michael Alvarez (ed), *Computational Social Science: Discovery and Prediction* (Cambridge University Press 2016) vii.

In this new arena, the goal is to calculate probabilities and predict or forecast future scenarios.[63] This predictive function has been understood as the key feature of Big Data.[64] Forecasting what may be can generate new discoveries, which may, in turn, render decision-making more accurate.[65] In addition to this predictive feature, the data driven rationale is another vital point making Big Data tremendously efficacious. Data driven models can process and correlate huge amounts of data in ways novel, not obvious to humans. This processing can result in trends and patterns, which humans would never have thought of and which may turn out to be peculiarly important for purposes pursued.[66]

However, promising Big Data driven predictions may also have unwanted side effects.[67] Predictive models, based on probability-oriented approaches, can allow for doubtful accuracy.[68] They foretell what may be, not what will be.[69] Therefore, these models offer a potentially accurate forecast of the future. They do not ensure truthful knowledge about the future. Moreover, data driven decisions, relying solely on data analysis and rejecting intuition, can grant such models unfettered discretion in deciding how to process and correlate data to reach outcomes. Further risks are posed, for data driven analysis can be opaque; people may not be aware of how their own behaviours can be forecasted.[70] Processing may also be inexplicable; and this seems hardly surprising. Some petabytes of data may be promptly processed by technologies; albeit, it might take years for individuals to read and interpret them.[71]

Despite undesirable risks, promising Big Data have been firmly embraced as an extremely valuable tool for making data driven decisions in the course of exercising public authority.

§II.3. Valuable Data Driven Decisions and Vulnerable Data Subjects

Big Data, their desirable promises and unwanted risks, have entered the public sphere. On the one hand, unprecedented flexibilities and efficiencies have been introduced.[72] Innovative technologies can reduce workload of public authorities. Namely, police can buy

---

[63] Shoshana Zuboff, 'Big Other: Surveillance Capitalism and the Prospects of an Information Civilization' (2015) 30 Journal of Information Technology 75 <https://doi.org/10.1057/jit.2015.5> accessed 5 October 2019; Henrik Skaug Sætra, 'Science as a Vocation in the Era of Big Data: The Philosophy of Science behind Big Data and Humanity's Continued Part in Science' (2018) 52(4) Integrative Psychological and Behavioral Science 508, 510 <https://doi.org/10.1007/s12124-018-9447-5> accessed 5 October 2019.

[64] Hamid Ekbia and others, 'Big Data, Bigger Dilemmas: A Critical Review' (2015) 66(8) Journal of the Association for Information Science and Technology 1523, 1529 <https://doi.org/10.1002/asi.23294> accessed 5 October 2019.

[65] Daniel Bumblauskas and others, 'Big Data Analytics: Transforming Data to Action' (2017) 23(3) Business Process Management Journal 703, 706 <https://doi.org/10.1108/BPMJ-03-2016-0056> accessed 5 October 2019.

[66] Dennis Broeders and others, 'Big Data and Security Policies: Towards a Framework for Regulating the Phases of Analytics and Use of Big Data' (2017) 33(3) Computer Law & Security Review 309, 312 <https://doi.org/10.1016/j.clsr.2017.03.002> accessed 5 October 2019.

[67] Charles Corbett, 'How Sustainable Is Big Data?' (2018) 27(9) Production and Operations Management 1685, 1692 <https://doi.org/10.1111/poms.12837> accessed 5 October 2019.

[68] Eyal Amir, 'Reasoning and Decision Making' in Keith Frankish and William Ramsey (eds), *The Cambridge Handbook of Artificial Intelligence* (Cambridge University Press 2014) 191, 202, 209 <https://doi.org/10.1017/CBO9781139046855.013> accessed 5 October 2019.

[69] Dennis Broeders and others, 'Big Data and Security Policies' (n 66) 312.

[70] Danuta Mendelson, 'Legal Protections for Personal Health Information in the Age of Big Data – A Proposal for Regulatory Framework' (2017) 3(1) Ethics, Medicine and Public Health 37, 42-43 <https://doi.org/10.1016/j.jemep.2017.02.005> accessed 5 October 2019.

[71] Tim Kraska, 'Finding the Needle in the Big Data Systems Haystack' (2013) 17(1) IEEE Internet Computing 84, 85 <https://ieeexplore.ieee.org/document/6415919> accessed 5 October 2019.

[72] Stephanie Palmer, 'Public Functions and Private Services: A Gap in Human Rights Protection' (2008) 6(3-4) International Journal of Constitutional Law 585, 586 <https://doi.org/10.1093/icon/mon027> accessed 5 October 2019.

proprietary software to promptly detect those at high risk of committing crimes.[73] On the other hand, private technologies may jeopardise fairness and justice. For instance, the right to privacy and non-discrimination may be threatened, where facial recognition systems, offered by firms to governments, unreasonably watch anyone passing by or misidentify coloured people.[74] Hence, in the name of efficiency, fundamental rights can be seriously affected, where private data driven technologies become well-embedded within the exercise of public authority. Things get more serious, where such technologies are implemented in the system of criminal justice, in general, and in sentencing courts, in particular.

Typically, a judge studies evidence and uses that evidence to order judgment. Part of her decision-making procedure is a risk assessment. That is, an assessment whose raison d'être is recidivism prediction and, more accurately, reasonable and correct recidivism prediction.[75] Based on the peculiar facts of the case, the judge reasonably determines probabilities of reoffending. She then orders final judgment that may affect the alleged offender by depriving him of his freedom. It could be assumed that the judge is partial and that the accused is coloured. If the judge carried the bias that 'black men tend to reoffend' and if she based her decision on an inaccurate study, brought as evidence before court and suggesting that 'blacks always reoffend', the defendant could exercise his rights to examine correctness of evidence and to be heard by an impartial judge.

Yet, with the advent of data driven models, there is no guarantee that the defendant can successfully exercise such fundamental rights. Proprietary and innovative, but potentially biased, models have enabled data driven risk to be used as evidence.[76] Data driven decision-making on probabilities of reoffending necessarily becomes part of the evidence, on which the final judgment may be based; it forms part of the process that has to be due and fair; and it is integral part of the judicial decision-making. To successfully exercise the right to examine accuracy of evidence or to be heard by an impartial judge, the defendant must be allowed to assess accuracy of the data driven decision. This presupposes access to the model and its source code. However, such access is denied by the proprietary nature of the model. Even if access were granted, complexities of data processing, the model's unintelligibility, might not allow for successful examination of the decision's accuracy. It, therefore, seems that data driven decision-making is, by its nature, in contrast to due process safeguards and fair trial standards.

Individuals' fundamental rights are, thus, affected by potentially inaccurate and partial decisions, whose data driven rationale grants private technologies almost unchecked authority and discretion. People's lives and rights can be further affected, where artificially intelligent technologies magnify to the greatest extent unwanted risks of the use of Big Data, like opacity and unintelligibility.

§II.4. At the Mercy of Artificially Intelligent Models

---

[73] Hykel Hosni and Angelo Vulpiani, 'Forecasting in Light of Big Data' (2018) 31(4) Philosophy & Technology 557, 560ff <https://doi.org/10.1007/s13347-017-0265-3> accessed 5 October 2019.

[74] Big Brother Watch, *Face off: The Lawless Growth of Facial Recognition in UK Policing* (Big Brother Watch 2018) 1, 3-4, 9, 13-16, 31, 32, 37 <https://bigbrotherwatch.org.uk/wp-content/uploads/2018/05/Face-Off-final-digital-1.pdf> accessed 5 October 2019.

[75] Jennifer Skeem and Christopher Lowenkamp, 'Risk, Race, and Recidivism: Predictive Bias and Disparate Impact' (2016) 54(4) Criminology 680, 685 <https://heinonline.org/HOL/P?h=hein.journals/crim54&i=680> accessed 5 October 2019; Stephen Wormith, 'Automated Offender Risk Assessment: The Next Generation or a Black Hole?' (2017) 16(1) Criminology & Public Policy 281, 290 <https://onlinelibrary.wiley.com/doi/pdf/10.1111/1745-9133.12277> accessed 5 October 2019.

[76] Kelly Hannah-Moffat, 'Algorithmic Risk Governance: Big Data Analytics, Race and Information Activism in Criminal Justice Debates' (2018) Theoretical Criminology (forthcoming) 1, 2, 8, 12 <https://doi.org/10.1177/1362480618763582> accessed 5 October 2019.

New forms of intelligence can exacerbate unwanted risks emerging from Big Data. Artificial Intelligence (AI) has always been aimed at making technologies think like humans, at performing tasks in ways that would be thought of as intelligent, if performed by humans.[77] Today, AI, 'unlocking the value of Big Data',[78] may render technologies even smarter, even more accurate when performing their predictive role.[79] Artificially intelligent models can better understand their surroundings and more effectively achieve their goals.[80]

Such intelligence, achievements and understanding can be enhanced by Machine Learning (ML). Without the need for instructions, technologies are trained on data and learn how to address problems and deliver outputs.[81] The more the training on data, the better the models become.[82] Yet how these models perform, what happens between input and output, may be unknown and incomprehensible to human experts, the very designers.[83] Further challenges seem to be ahead, for Deep Learning (DL) is said to 'beat' ML techniques.[84] DL involves even better understanding and even higher levels of intelligence, which can be allowed and enhanced by the propensity to gather 'all the data' and use them for ever-changing purposes.[85] This may lead to further complexity of processing.[86] New forms of learning may allow for a completely

---

[77] Samir Chopra and Laurence White, *A Legal Theory for Autonomous Artificial Agents* (University of Michigan Press 2011) 5.

[78] Information Commissioner's Office, 'Big Data, Artificial Intelligence, Machine Learning and Data Protection' (Version: 2.2, ICO 2017) 8 <https://ico.org.uk/media/for-organisations/documents/2013559/big-data-ai-ml-and-data-protection.pdf> accessed 5 October 2019.

[79] UK Government Office for Science, *Artificial Intelligence: Opportunities and Implications for the Future of Decision Making* (Government Office for Science 2015) 5 <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/566075/gs-16-19-artificial-intelligence-ai-report.pdf> accessed 5 October 2019.

[80] See in general: Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (2nd edn, Pearson Education 2003) 2-5.

[81] Andrew Tutt, 'An FDA for Algorithms' (2017) 69(1) Administrative Law Review 83, 85ff <http://dx.doi.org/10.2139/ssrn.2747994> accessed 5 October 2019.

[82] Michael Jordan and Tom Mitchell, 'Machine Learning: Trends, Perspectives, and Prospects' (2015) 349(6245) Science 255 <http://science.sciencemag.org/content/349/6245/255.full> accessed 5 October 2019.

[83] Lucas Introna, 'Algorithms, Governance, and Governmentality: On Governing Academic Writing' (2016) 41(1) Science, Technology, & Human Values 17, 25 <https://doi.org/10.1177/0162243915587360> accessed 5 October 2019; Bruno Lepri and others, 'Fair, Transparent, and Accountable Algorithmic Decision-making Processes: The Premise, the Proposed Solutions, and the Open Challenges' (2018) 31(4) Philosophy & Technology 611, 619-620 <https://doi.org/10.1007/s13347-017-0279-x> accessed 5 October 2019; Balázs Bodó and others, 'Tackling the Algorithmic Control Crisis – The Technical, Legal, and Ethical Challenges of Research into Algorithmic Agents' (2017) 19 Yale Journal of Law & Technology 133, 144 <https://www.ivir.nl/publicaties/download/YJLT_2017.pdf> accessed 5 October 2019.

[84] Yann LeCun, Yoshua Bengio and Geoffrey Hinton, 'Deep learning' (2015) 521 Nature 436 <https://www.nature.com/articles/nature14539> accessed 5 October 2019.

[85] Marcus Bloice and Andreas Holzinger, 'A Tutorial on Machine Learning and Data Science Tools with Python' in Andreas Holzinger (ed), *Machine Learning for Health Informatics: State-of-the-Art and Future Challenges* (Springer 2016) 435, 478 <https://link.springer.com/book/10.1007%2F978-3-319-50478-0> accessed 5 October 2019; Michael Butterworth, 'The ICO and Artificial Intelligence: The Role of Fairness in the GDPR Framework' (2018) 34(2) Computer Law & Security Review 257, 259 <https://doi.org/10.1016/j.clsr.2018.01.004> accessed 5 October 2019.

[86] Mohammad Havaei and others, 'Deep Learning Trends for Focal Brain Pathology Segmentation in MRI' in Andreas Holzinger (ed), *Machine Learning for Health Informatics* (n 85) 125, 132.

black box effect accompanied by absolute lack of intelligibility;[87] opaque decision making can remain uninterpreted and unexplained.[88]

Therefore, transparency and interpretability, whose lack is an undesirable consequence of Big Data's structure, can become totally absent, where new models learn and predict patterns and claims. Such artificially intelligent models may thus be brought closer to AI's goals; that is, making technologies think like people, like opaque, unintelligible but also biased human minds.[89] These new forms of intelligence are not 'science fiction'; they are real and happening.[90] An example could be helpful to determine the extent to which such potentially opaque and unintelligible decision-making may affect people.

A sentencing court can deploy a private data driven model for the purposes of evaluating the accused by calculating probabilities of future offence. For the sake of simplicity, it is assumed that the model has been trained on historical criminal data about jurisdictions X and Y covering the period from 2015 to 2018 and that it uses the defendant's gender, economic status and arrest record as risk factors. It is further assumed that, according to training data, during the covered period, 2,000 crimes were committed in jurisdiction X; 1,900 of them were committed by economically weak males with a previous criminal record; the rest 100 crimes were committed by wealthy females without previous record. In jurisdiction Y, according to the input, no crime was committed during that period. Yet the reality is that 10,000 crimes were committed in Y during the covered period; all were committed by wealthy females, who had never been arrested.

In a hypothetical situation, two different cases are heard before the above sentencing court. In the first case, the accused, an unemployed male from X, has already been arrested twice. In the second case, the defendant, a female lawyer from Y, has an income well above average and no previous arrest record. Dependent upon its input, the model may recommend that the former defendant be at high risk of reoffending and the latter be at low risk. This could lead to an unfair mistreatment of all defendants resembling (or being) poor males from X with previous arrest record. Such mistreatment would rely on an unfair past, ie the belief that these males are more dangerous than wealthy females from Y with no criminal record.

Based on this existing belief, the model would forecast the unfair scenario that poor males from X with arrest record would be at higher risk. By evaluating the accused as being at high risk, the model would suggest that this unjust scenario be made real in present time. If the judge relied upon the data driven evaluation, treated all defendants (being or) resembling poor males from X with arrest record as being at high risk and convicted them, such defendants would be disadvantaged for a behaviour that they might (but also might not) express in the future; and

---

[87] See in general: Frank Pasquale, *Black Box Society: The Secret Algorithms That Control Money and Information* (Harvard University Press 2016); Gianclaudio Malgieri and Giovanni Comandé, 'Why a Right to Legibility of Automated Decision-Making Exists in the General Data Protection Regulation' (2017) 7(4) International Data Privacy Law 243 <https://doi.org/10.1093/idpl/ipx019> accessed 5 October 2019.

[88] Andrew Selbst and Julia Powles, 'Meaningful Information and the Right to Explanation' (2017) 7(4) International Data Privacy Law 233 <https://doi.org/10.1093/idpl/ipx022> accessed 5 October 2019; Sandra Wachter, Brent Mittelstadt and Luciano Floridi, 'Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation' (2017) 7(2) International Data Privacy Law 76 <https://doi.org/10.1093/idpl/ipx005> accessed 5 October 2019.

[89] Paul Katsafanas, 'Nietzsche's Account of Self-Conscious Agency' (2018) 21(1) Philosophical Explorations 122, 123-124 <https://doi.org/10.1080/13869795.2017.1421695> accessed 5 October 2019; William Samuelson and Richard Zeckhauser, 'Status Quo Bias in Decision Making' (1988) 1(1) Journal of Risk and Uncertainty 7 <https://doi.org/10.1007/BF00055564> accessed 5 October 2019.

[90] Christopher Kuner and others, 'Expanding the Artificial Intelligence-Data Protection Debate' (2018) 8(4) International Data Privacy Law 289 <https://doi.org/10.1093/idpl/ipy024> accessed 5 October 2019.

wealthy females from Y with no arrest record could be treated as innocent and escape imprisonment.

This hypothetical scenario can exemplify data driven models' potential partiality. Bias may occur in many stages; before, during or after their design.[91] Literature seems to reject the idea that new Big Data-sets can allow for impartiality. Rather, it suggests that Big Data and ML technologies are far from being neutral.[92] Data driven decision-making may discriminate against individuals;[93] it may do so, on the basis of uncertain future scenarios that can be rendered reality at present time. As O'Neil has put it, people pay 'for their treatment before that might happen'.[94] However, people, represented by numbers forecasting likelihoods, have long been paying for 'their treatment before that might happen'. Pre-emptive criminalisation, based on expectations and likelihoods, is not a phenomenon introduced by data driven technologies. It dates back to the nineteen-seventies, when criminal justice systems emphasised efficiency over fairness, public security over due process and risk-oriented perspectives over individualised rehabilitation.[95]

More precisely, statistical approaches to and numerical representations of people seem absent in theories, like rehabilitation,[96] supporting individualised sentencing with a view to treating people in a humane way and preparing reintegration into society.[97] According to such theories, judges are given full discretion in deciding the type of sentence that can best fit a case and treat an individual.[98] Namely, one may commit murder and confess. The judge can use any type of evidence to evaluate the offender's personality; from testimonies about his mental illness to scientific studies linking his illness to criminal behaviour. After using any means of evidence, the judge can assess the defendant's blameworthiness, culpability and likelihood of reoffending. The methodology and outcome of such assessments, relying on evidence that can be subjectively perceived, are dependent upon each individual case. Different cases and offenders allow for different conclusions; this can lead to diverse sentencing decisions. In the nineteen-seventies, this diversity raised the need for consistency,[99] a need data driven models could satisfy.

---

[91] Engin Bozdag, 'Bias in Algorithmic Filtering and Personalization' (2013) 15(3) Ethics and Information Technology 209, 210ff <https://doi.org/10.1007/s10676-013-9321-6> accessed 5 October 2019.

[92] Solon Barocas and Andrew Selbst, 'Big Data's Disparate Impact' (2016) 104(3) California Law Review 671 <http://dx.doi.org/10.15779/Z38BG31> accessed 5 October 2019.

[93] Seda Gürses and Bart Preneel, 'Cryptology and Privacy in the Context of Big Data' in Bart van der Sloot, Dennis Broeders and Erik Schrijvers (eds), *Exploring the Boundaries of Big Data* (WRR Amsterdam University Press 2016) 49, 52; Omer Tene and Jules Polonetsky, 'Judged by The Tin Man: Individual Rights in the Age of Big Data' (2013) 11 Journal of Telecommunications and High Technology Law 351, 355ff; Bart Schermer, 'The Limits of Privacy in Automated Profiling and Data Mining' (2011) 27(1) Computer Law & Security Review 45, 47 <https://doi.org/10.1016/j.clsr.2010.11.009> accessed 5 October 2019.

[94] James Schamus, Interview with Cathy O'Neil (Filmmaker Magazine, 14 September 2017) 066 <https://filmmakermagazine.com/103281-rise-of-the-machines/#.W8bMQmgzZEY> accessed 5 October 2019.

[95] Diana Wendy Fitzgibbon, 'Institutional Racism, Pre-Emptive Criminalisation and Risk Analysis' (2007) 46(2) The Howard Journal of Criminal Justice 128, 128-133 <https://doi.org/10.1111/j.1468-2311.2007.00461.x> accessed 5 October 2019.

[96] Polaris Koi, Susanne Uusitalo and Jarno Tuominen, 'Self-Control in Responsibility Enhancement and Criminal Rehabilitation' (2018) 12(2) Criminal Law and Philosophy 227, 237 <https://doi.org/10.1007/s11572-017-9423-z> accessed 5 October 2019.

[97] Deirdre Golash, *The Case Against Punishment: Retribution, Crime Prevention, and the Law* (New York University Press 2005) 18.

[98] Douglas Berman, 'Re-Balancing Fitness, Fairness, and Finality for Sentences' (2014) 4(1) Wake Forest Journal of Law & Policy 151, 157-158 <https://heinonline.org/HOL/P?h=hein.journals/wfjlapo4&i=155> accessed 5 October 2019.

[99] Douglas Berman, 'Re-Balancing Fitness, Fairness, and Finality for Sentences' (n 98) 157, 161.

Introduced as the successors of humanmade judgements, data driven models (or actuarial tools) initially involved static criteria (eg, gender or criminal record); yet further developments in the end of the twentieth century resulted in the use of dynamic (changeable) factors as well (eg, health condition).[100] Today, instead of relying on humanmade examination of evidence, the discretional judge of the above murder-example can, at the risk of being transformed into an executant judge, rely on data driven models, like the Level of Service Inventory-Revised (LSI-R)[101] or the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS).[102] Such models may use risk factors (eg, gender) that are not blameworthy. The fact that one is female is out of her control and can in no way contribute to committing murder. Linking gender to blameworthiness and culpability would most probably be irrational and unjustifiable. Still, gender and other factors might be good in foretelling likelihoods of future behaviours.[103]

Data driven models aim neither at examining culpability for prior crimes nor at justifying and explicating blameworthiness. They aim at predicting risk; and, in the name of correct risk forecasting, they may use any supposedly accuracy-enhancing factor, from gender to shoe size.[104] Though not blameworthy, such criteria can be considered as valid for the purposes of calculating probabilities. This can explain that what new forms of artificial intelligence have introduced is magnified opacity and unintelligibility, rather than pre-emption; data driven assessments, aimed at foretelling instead of explaining, neither reveal nor explicate how the outcome (eg, the score 'high risk') is linked to the supposedly accuracy-enhancing factors (eg, gender).

In the absence of data driven models, the evaluation of the accused would be the outcome of due process, like examination of accessible evidence. The defendant affected could be aware of and contest such evidence, as well as final judgment that could have been based on this evidence. However, where data driven models replace due process, defendants can be judged by proprietary data driven technologies, whose very existence they may ignore[105] and whose potentially unfair decision-making they may neither view nor challenge.[106]

---

[100] See, in general: Donald Arthur Andrews and James Bonta, *The Psychology of Criminal Conduct* (5th edn, Matthew Bender and Company 2010) 312-321; James Bonta and Donald Arthur Andrews, *Risk-Need-Responsivity Model for Offender Assessment and Rehabilitation* (Government of Canada 2007) 3-4 <https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/rsk-nd-rspnsvty/rsk-nd-rspnsvty-eng.pdf> accessed 5 October 2019; Donald Arthur Andrews, James Bonta and Stephen Wormith, 'The Recent Past and Near Future of Risk and/or Need Assessment' (2006) 52(1) Crime & Delinquency 7, 8 <https://doi.org/10.1177/0011128705281756> accessed 5 October 2019.

[101] Alexander Holsinger, Christopher Lowenkamp and Edward Latessa, 'Exploring the Validity of the Level of Service Inventory-Revised with Native American Offenders' (2006) 34(3) Journal of Criminal Justice 331 <https://doi.org/10.1016/j.jcrimjus.2006.03.009> accessed 5 October 2019.

[102] Tracy Fass and others, 'The LSI-R and the COMPAS: Validation Data on Two Risk-Needs Tools' (2008) 35(9) Criminal Justice and Behavior 1095 <https://heinonline.org/HOL/P?h=hein.journals/crmjusbhv35&i=1054> accessed 5 October 2019.

[103] Mark Moore, 'Purblind Justice: Normative Issues in the Use of Prediction in the Criminal Justice System' in National Research Council, *Criminal Careers and "Career Criminals"* (Vol 2, The National Academies Press 1986) 314, 317-318.

[104] Richard Berk and Justin Bleich, 'Forecasts of Violence to Inform Sentencing Decisions' (2014) 30(1) Journal of Quantitative Criminology 79, 81-82 <https://doi.org/10.1007/s10940-013-9195-0> accessed 5 October 2019.

[105] Gwen van Eijk, 'Socioeconomic Marginality in Sentencing: The Built-in Bias in Risk Assessment Tools and the Reproduction of Social Inequality' (2017) 19(4) Punishment & Society 463, 466 <https://doi.org/10.1177/1462474516666282> accessed 5 October 2019.

[106] For the failure to understand and challenge unfair decisions made by private technologies, whose controllers perform a quasi-public role, see: Oren Bracha and Frank Pasquale, 'Federal Search Commission? Access, Fairness,

Importantly, the accuracy of such decision-making may be assessed and verified neither by court nor by the private entity controlling the technology. Courts use such technologies to reduce workload. Verification attempts would negate the efficiency-related purposes for which the data driven model would have been deployed. Moreover, the private party is a for-profit entity. This profit, inextricably linked to and highly dependent upon the very deployment and use of the model, makes the private actor biased; he cannot be trusted in examining accuracy of his own model, its inputs and outputs.[107] Yet data that are not verified by court and that cannot or should not be verified by the private actor can be used as the basis upon which judicial power is exercised. Namely, inaccurate input (eg, that 'coloured from X have engaged in crime') and biased output (eg, that 'coloured from X are more likely to reoffend') can become the grounds of convicting decisions that affect the lives of those resembling (or being) coloured from X. This way, judicial authority can be exercised on the basis of unverified data, potentially incorrect information.

§II.5. Conclusion

Big Data may be beneficial, valuable and necessary. They can guarantee effectiveness and efficiency, from safety in delivering health-related services to a better understanding of climate change.[108] Big Data can predict the weather, but also people's behaviour. They may resolve numerous problems, albeit, they do not always address inaccuracy and bias in, perhaps opaque and unintelligible, data driven decision-making.[109]

Used by sentencing courts, data driven models are aimed at supporting long-established pre-emptive strategies. They are implemented to prioritise risk assessments over understanding of procedures; they are installed to work against, rather than with, the idea that the future is (supposed to be) uncertain. This way, fairness and justice can be undermined and sacrificed in the name of efficiency. Even though such undermining and sacrifice date back to the previous century, they are now promoted through data driven technologies, well-embedded within public procedures and controlled by private actors not subject to public checks and balances. Alleged infringers, perhaps ignorant of the existence of such technologies, may be convicted on the basis of unverified data driven evidence and without the chance of challenging accuracy of this evidence.

The initial goals of AI were to make technologies act and think in human-like ways. People seem to have accepted artificially intelligent models as truly smart, as capable of performing tasks in manners that, if performed by humans, would be deemed intelligent. Despite impressive levels of AI, it may not be the intellect of these technologies that should be taken into consideration when addressing their regulation; rather, it may be the way in which and the extent to which they affect people and their lives that should be borne in mind.[110] There may then be a need to accept that data driven technologies can carry some form of human-like

---

and Accountability in the Law of Search' (2008) 93(6) Cornell Law Review 1149, 1175 <https://scholarship.law.cornell.edu/clr/vol93/iss6/11> accessed 5 October 2019.

[107] Katherine Freeman, 'Algorithmic Injustice: How the Wisconsin Supreme Court Failed to Protect Due Process Rights in State v. Loomis' (2016) 18 North Carolina Journal of Law & Technology 75, 92.

[108] Kristian Kersting and Ulrich Meyer, 'From Big Data to Big Artificial Intelligence? Algorithmic Challenges and Opportunities of Big Data' (2018) 32(1) Künstliche Intelligenz 3, 4 <https://doi.org/10.1007/s13218-017-0523-7> accessed 5 October 2019; Wendy Lipworth and others, 'Ethics and Epistemology in Big Data Research' (2017) 14(4) Journal of Bioethical Inquiry 489, 490 <https://doi.org/10.1007/s11673-017-9771-3> accessed 5 October 2019.

[109] Wenhong Chen and Anabel Quan-Haase, 'Big Data Ethics and Politics: Toward New Understandings' (2018) Social Science Computer Review (forthcoming) 1, 2 <https://doi.org/10.1177/0894439318810734> accessed 5 October 2019.

[110] Samir Chopra and Laurence White, *A Legal Theory for Autonomous Artificial Agents* (n 77) 154-155.

power-exercising capacity, when they make decisions that, if made by humans, would be considered as fair or unfair, as ethical or malicious, as seriously affecting people's lives and fundamental rights.

The bigness and greatness of that effect seems to call for an understanding of decision-making, sentencing courts delegate to private data driven models, as exercise of power. Were this the case, this form of power would –or should– be a legitimate form of power; it would –or should– be an authority.

III. DATA DRIVEN DECISION-MAKING AS EXERCISE OF AUTHORITY

§III.1. Introduction

Public power can be legitimised when compliant with the law and accepted by the people. Exercising such power in the best interests of the people, public actors are bound by a general duty to abide by law and ensure predictability to let citizens know what is prohibited. When one is certain of what is forbidden, she can make her plans in life.

Namely, legislators may strictly forbid alcohol consumption by those under the age of eighteen. A parent can be confident that her ten-year-old minor will not consume alcohol before reaching this age. The parent trusts public authorities in keeping that age threshold relatively stable. Were the minimum age being lowered almost every month by two or three years, uncertainty would emerge; within less than a year, the ten-year-old child might be able to explore today's age restricted venues. In the face of such uncertainty, the parent would not be able to trust public authorities in ensuring predictability. Therefore, the parent trusts public actors in the sense that she behaves, as if today's laws would be the laws of tomorrow.[111] On the other hand, no law remains unchangeable. The above age restrictions can be susceptible to amendment, as society itself changes. The parent can then expect that a different age threshold may be applied to her future grandchildren. From this perspective, she trusts public actors in the sense that she acts, as if laws would remain relatively stable, rather than immutable.

To meet people's expectations, public actors need to comply with certain requirements. For example, were such threshold lowered to seventeen years old, legislators would have to justify the amendment to prove compliance with law. In such a scenario, a reason might rely on scientific evidence proving that people at the age of seventeen are sufficiently (physically and mentally) mature. This could prove compliance with applicable legal provisions (eg, on adulthood) and would, perhaps, persuade the people.

If legislators delegated decisions on such age thresholds to private data driven models, similar justifications would be needed. Namely, if a model decided that twelve is the best age marker for adulthood, but gave no reason for this, people would not be persuaded. Nor would they be sufficiently persuaded, were the decision based on the reason that 'processing of data about alcohol use in early ages reveals no risk of addiction'. It could then be fair to demand that, where public authorities delegate decisions to these models, data driven decision-making should meet requirements that would be complied with, if public authorities made such decisions.

This chapter analyses some important social and legal aspects of power. The goal is to examine how the treatment of decision-making, sentencing courts delegate to private data driven technologies, as exercise of authority could justify the application of fiduciary laws; a potential application that is addressed in the next chapter.

§III.2. Transforming Power into Authority

With its roots in the Latin auctoritas, authority was originally understood as coming from the inspirational auctor,[112] the one who was worthy of respect by reason of his capacity to

---

[111] Gerard Alexander, 'Institutionalized Uncertainty, the Rule of Law, and the Sources of Democratic Stability' (2002) 35(10) Comparative Political Studies 1145, 1162 <https://doi.org/10.1177/001041402237946> accessed 5 October 2019.

[112] Giovanni Filoramo, 'Foundations of Power and Conflicts of Authority in Late-Antique Monasticism: An Introduction' in Alberto Camplani and Giovanni Filoramo (eds), *Foundations of Power and Conflicts of Authority in Late-antique Monasticism* (Peeters Publishers 2007) 1, 5; John Percy Vyvian Dacre Balsdon, 'Auctoritas, Dignitas, Otium' (1960) 10(1) The Classical Quarterly 43 <https://www.jstor.org/stable/637589> accessed 5 October 2019.

develop and improve things (augere).[113] Suggesting an understanding of power in a moral sense, auctoritas involved voluntary adherence on the basis of the auctor's wisdom.[114] The auctor's past and present repute could guarantee that power of an ethical nature and of a higher quality would be exercised to bring rightness.[115] His moral standing, armed with prestige or seniority, could foster trust;[116] it could allow for peace and prosperity, leaving no space for suspicion or mistrust.[117] Therefore, authority was linked to trust, to relying on the credible auctor. Even though today the adage tends to go 'power corrupts',[118] trust can be detected in contemporary exercises of power. Such trust is not based on the auctor's wisdom or moral standing. Rather, as this section argues, trust is based on compliance with the law.

Power may refer to, among others, control, monitoring, surveillance, governance or knowledge.[119] It has been examined in several contexts and from various perspectives. From an empirical perspective, power can be seen as an impact;[120] an effect arising (mainly) in unequal relations.[121] Namely, parents can monitor children, physicians can influence patients and states can control citizens.[122] Understood in terms of how people interact, power can be related to one's capacity to peculiarly affect someone.[123] This understanding, suggesting potentiality,

---

[113] Harro Höpfl, 'Power, Authority and Legitimacy' (1999) 2(3) Human Resource Development International 217, 219ff <https://doi.org/10.1080/13678869900000024> accessed 5 October 2019; Federico Santangelo, 'Priestly *Auctoritas* in the Roman Republic' (2013) 63(2) Classical Quarterly 743, 744 <https://doi.org/10.1017/S0009838813000220> accessed 5 October 2019; Edgar Straehle, 'Thomas Hobbes and the Secularization of Authority' in Anna Tomaszewska and Hasse Hämäläinen (eds), *The Sources of Secularism: Enlightenment and Beyond* (Palgrave Macmillan 2017) 101, 102 <https://doi.org/10.1007/978-3-319-65394-5_6> accessed 5 October 2019.

[114] Ryan Szpiech, *Conversion and Narrative: Reading and Religious Authority in Medieval Polemic* (University of Pennsylvania Press 2013) 63; Harro Höpfl, 'Power, Authority and Legitimacy' (n 113) 222, 227.

[115] Gregory Rowe, 'Reconsidering the *Auctoritas* of Augustus' (2013) 103 The Journal of Roman Studies 1, 6-9 <https://www.jstor.org/stable/43286777> accessed 5 October 2019; John Percy Vyvian Dacre Balsdon, 'Auctoritas, Dignitas, Otium' (n 112) 45.

[116] Karl Galinsky, *Augustan Culture: An Interpretive Introduction* (Princeton University Press 1996) 80; Federico Santangelo, 'Priestly *Auctoritas* in the Roman Republic' (n 113) 746, 749; Edgar Straehle, 'Thomas Hobbes and the Secularization of Authority' (n 113) 102ff; Gregory Rowe, 'Reconsidering the *Auctoritas* of Augustus' (n 115) 6-7.

[117] Gregory Rowe, 'Reconsidering the *Auctoritas* of Augustus' (n 115) 8-9.

[118] Mark Snyder and Marc Kiviniemi, 'Getting What They Came For: How Power Influences the Dynamics and Outcomes of Interpersonal Interaction' in Annette Lee-Chai and John Bargh (eds), *The Use and Abuse of Power: Multiple Perspectives on the Causes of Corruption* (Psychology Press 2001) 133, 151.

[119] Michael DeValve, 'Love/Power' (2017) 25(3) Critical Criminology 375, 380, 383 <https://doi.org/10.1007/s10612-016-9347-2> accessed 5 October 2019; Bert-Jaap Koops, 'Law, Technology, and Shifting Power Relations' (2010) 25(2) Berkeley Technology Law Journal 973, 975 <https://doi.org/10.15779/Z38V11F> accessed 5 October 2019.

[120] Michel Foucault, 'The Subject and Power' (1982) 8(4) Critical Inquiry 777, 780ff <http://www.jstor.org/stable/1343197> accessed 5 October 2019.

[121] Robert Dahl, 'The Concept of Power' (1957) 2(3) Behavioral Science 201, 203 <https://doi.org/10.1002/bs.3830020303> accessed 5 October 2019; Alan Page Fiske, 'The Four Elementary Forms of Sociality: Framework for a Unified Theory of Social Relations' (1992) 99(4) Psychological Review 689, 700ff; Richard Emerson, 'Power-Dependence Relations' (1962) 27(1) American Sociological Review 31 <https://www.jstor.org/stable/2089716> accessed 5 October 2019.

[122] Michel Foucault, 'The Subject and Power' (n 120) 780; Hannah Arendt, 'Authority in the Twentieth Century' (1956) 18(4) The Review of Politics 403, 403-404 <https://www.jstor.org/stable/1404647> accessed 5 October 2019.

[123] John Turner, 'Explaining the Nature of Power: A Three-Process Theory' (2005) 35(1) European Journal of Social Psychology 1, 6 <https://doi.org/10.1002/ejsp.244> accessed 5 October 2019; Theodore Kemper, 'Predicting Emotions from Social Relations' (1991) 54(4) Social Psychology Quarterly 330, 332 <https://www.jstor.org/stable/2786845> accessed 5 October 2019; Bertram Raven, Joseph Schwarzwald and Meni Koslowsky, 'Conceptualizing and Measuring a Power/Interaction Model of Interpersonal Influence' (1998) 28(4) Journal of Applied Social Psychology 307 <https://doi.org/10.1111/j.1559-1816.1998.tb01708.x> accessed 5

broadens the scope of power. The capacity to affect, not the actual impact on, someone may suffice for power to exist.[124]

Another approach to power relates to ways of its perception.[125] In a positive sense, it has been perceived as authority;[126] that is, a concept linked to claims for adherence.[127] Namely, a state, exercising authority over citizens, can claim compliance with an order. Power becomes authority insofar as it is accepted by those subjected to it.[128] Citizens may be willing to comply with the state's authority, for such adherence would actually be in their own best interests.[129] They may perceive it as fair, as portraying their values and goals or the public good.[130] Such perceptions, legitimising power and transforming it into authority,[131] are strongly related to the rule of law, a concept requiring legitimation of power be conditional or highly dependent upon compliance with law.

The rule of law demands that those in authority (eg, government) and those subject to it (eg, citizens) abide by and conform to the law.[132] From this perspective, power becomes authority when compliant with law and where citizens obey. For example, the government, assuming authority, can apply an environment-related measure to its jurisdiction. According to this measure, a fine of EUR 50.00 should be imposed for littering by dropping cigarette butts. The government has, at minimum, a duty to govern in accordance with law. It cannot keep that measure secret, nor can it alter the fine every week from EUR 50.00 to EUR 200.00 and vice versa. Adequate access to law and relative stability are required to enable people to obey it.[133] By staying within the boundaries and limits set out in legal provisions, the state exercises authority.[134] Moreover, citizens can respect the measure. Even those who do not agree with the

October 2019; Linda Molm, 'Is Punishment Effective? Coercive Strategies in Social Exchange' (1994) 57(2) Social Psychology Quarterly 75, 77 <https://www.jstor.org/stable/2786703> accessed 5 October 2019.

[124] Meni Koslowsky and Shmuel Stashevsky, 'Organizational Values and Social Power' (2005) 26(1) International Journal of Manpower 23 <https://doi.org/10.1108/01437720510587253> accessed 5 October 2019.

[125] Dan Silverman, Joel Slemrod and Neslihan Uler, 'Distinguishing the Role of Authority "In" and Authority "To"' (2014) 113 Journal of Public Economics 32, 41 <https://doi.org/10.1016/j.jpubeco.2014.02.003> accessed 5 October 2019.

[126] Timo Airaksinen, 'Coercion, Deterrence, and Authority' (1984) 17(2) Theory and Decision 105, 115 <https://doi.org/10.1007/BF00160977> accessed 5 October 2019.

[127] Max Weber, *The Theory of Social and Economic Organization* (The Free Press 1964) 328ff.

[128] Norman Uphoff, 'Distinguishing Power, Authority & Legitimacy: Taking Max Weber at His Word by Using Resources-Exchange Analysis' (1989) 22(2) Polity 295, 303, 312 <https://www.jstor.org/stable/3234836> accessed 5 October 2019.

[129] Max Weber, *Economy and Society: An Outline of Interpretive Sociology* (University of California Press 2013) 212ff.

[130] Timothy Stanton, 'Authority and Freedom in the Interpretation of Locke's Political Theory' (2011) 39(1) Political Theory 6, 15 <https://doi.org/10.1177/0090591710386571> accessed 5 October 2019.

[131] Richard Emerson, 'Power-Dependence Relations' (n 121) 38; A J Grimes, 'Authority, Power, Influence and Social Control: A Theoretical Synthesis' (1978) 3(4) The Academy of Management Review 724, 726 <https://www.jstor.org/stable/257928> accessed 5 October 2019; Emily Nacol, 'The Risks of Political Authority: Trust, Knowledge and Political Agency in Locke's *Second Treatise*' (2011) 59(3) Political Studies 580, 582 <https://doi.org/10.1111/j.1467-9248.2010.00878.x> accessed 5 October 2019; Gary Hamilton, 'World Images, Authority, and Institutions: A Comparison of China and the West' (2010) 13(1) European Journal of Social Theory 31, 34 <https://doi.org/10.1177/1368431009355860> accessed 5 October 2019.

[132] Joseph Raz, *The Authority of Law: Essays on Law and Morality* (Clarendon Press 1979) 212-213.

[133] Joseph Raz, *The Authority of Law* (n 132) 213-214.

[134] Jeremy Waldron, 'Stare Decisis and the Rule of Law: A Layered Approach' (2012) 111 Michigan Law Review 1, 3 <https://heinonline.org/HOL/P?h=hein.journals/mlr111&i=13> accessed 5 October 2019.

amount of the fine obey the rule, for it serves the purpose of environmental protection that they identify with. People see the measure as reflecting their beliefs and deserving of obedience.[135]

Linking authority to the notion of the rule of law reveals the peculiar role that trust plays in the public authority-citizen relationship.[136] Citizens trust that the government does what it is demanded to do. They trust that it complies with the law when making, interpreting or enforcing it and that it provides for accessible systems that allow for public scrutiny.[137] In the above littering-example, if a police officer arbitrarily imposed on a coloured woman a fine of EUR 300.00, he would be held accountable; the citizen could report him and challenge the fine. Furthermore, people trust that measures taken by the government are for their benefit. Were the above fine imposed only on women or the poor, the measure would be considered as serving solely men or the rich and, therefore, as unfair.

Importantly, in the trust-like relationship between public authority and citizens, the rule of law requires predictability.[138] Where law is accessible, precise and relatively stable, citizens can be certain of what they are allowed to do.[139] Predictability also implies certainty that law made is law agreed upon.[140] However, actual consensus on each measure's application may not be possible. Citizens cannot confer trust with regard to any measure taken. This might require that states subject all measures to, eg, referendums to ensure that trust is conferred. Admittedly, states cannot undertake such everyday-referendums. What they can do is act, as if citizens actually did actively agree upon measures taken; this way, states act upon authority, rather than power. From this point of view, predictability and certainty, eg that law made is law agreed upon, are artificial. Instead of conferring trust for each and every case, there is a presumption of trust that the state exercises authority for the benefit of the people and in compliance with law. This presumption makes exercise of power by the state justifiable.[141] And rulers can enhance their trustworthiness when they opt for openness, communicate their motives and goals[142] or disclose proof of just conduct.[143]

§III.3. Relying on Experts

A variant of authority involving trust is epistemic authority. Although all humans are said to be related to homo sapiens (the wise man)[144] not all people are experts. Therefore, an authority is needed to play that role, where individuals lack expertise. Epistemic authority

---

[135] Brian Tamanaha, 'A Concise Guide to the Rule of Law' (2007) St John's Legal Studies Research Paper 82/2007, 13-14 <http://ssrn.com/abstract=1012051> accessed 5 October 2019.

[136] Evan Fox-Decent, 'Is the Rule of Law Really Indifferent to Human Rights?' (2008) 27(6) Law and Philosophy 533, 549 <https://www.jstor.org/stable/27652667> accessed 5 October 2019.

[137] Brian Tamanaha, 'A Concise Guide to the Rule of Law' (n 135) 9; Jan-Philipp Goertz, 'The Rule of Law - Meaning and Significance for Security Policy and Reform' (1998) 7(3) European Security 101, 102-103 <https://doi.org/10.1080/09662839808407375> accessed 5 October 2019.

[138] Antonin Scalia, 'The Rule of Law as a Law of Rules' (1989) 56(4) University of Chicago Law Review 1175, 1179 <https://heinonline.org/HOL/P?h=hein.journals/uclr56&i=1185> accessed 5 October 2019.

[139] Brian Tamanaha, 'A Concise Guide to the Rule of Law' (n 135) 8.

[140] Jan-Philipp Goertz, 'The Rule of Law' (n 137) 102-103.

[141] Devika Hovell, 'On Trust: The UN as Fiduciary (A Reply to Rosa Freedman)' (2018) LSE Law, Society and Economy Working Paper 13/2018, 7 <http://dx.doi.org/10.2139/ssrn.3204151> accessed 5 October 2019.

[142] Eva Hofmann and others, 'Enhancing Tax Compliance through Coercive and Legitimate Power of Tax Authorities by Concurrently Diminishing or Facilitating Trust in Tax Authorities' (2014) 36(3) Law & Policy 290, 293 <https://doi.org/10.1111/lapo.12021> accessed 5 October 2019.

[143] Tom Tyler and Allan Lind, 'A Relational Model of Authority in Groups' (1992) 25 Advances in Experimental Social Psychology 115, 155 <https://doi.org/10.1016/S0065-2601(08)60283-X> accessed 5 October 2019.

[144] Arie Kruglanski and others, 'Three Decades of Lay Epistemics: The Why, How, and Who of Knowledge Formation' (2009) 20(1) European Review of Social Psychology 146 <https://doi.org/10.1080/10463280902860037> accessed 5 October 2019.

performs its role as an agent who is believed to have expertise.[145] It is trusted as a credible, accurate and reliable source, upon which one can rely to acquire knowledge.[146] Acknowledged as an expert with superior competence and reasoning capacities, such authority is believed to be capable of analysing evidence and drawing conclusions.[147] It can address a matter, on which the one who trusts the authority is not expert.[148] Therefore, epistemic authorities are trusted to provide veracious and faithful information for the benefit of lay people.[149] People, accepting such authorities as legitimate, respect them. They also depend on them, for epistemic authorities are believed to be better in making things right.[150] In this context, an excellent example of epistemic authority could be that exercised by a parent over her six-year old minor, who would most probably perceive such power as undoubtful truth.[151]

Another example could be found in courtrooms. In criminal proceedings, a health professional may be asked to provide her opinion on the mental condition of the alleged offender.[152] In such a case, the expert has a crucial role; her conclusions can be determinative for the final judgment.[153] To better perform this substantial role, the professional must be able to justify her reasoning.[154] Detailed explanations could strengthen her trustworthiness and truthfulness.[155] She can also opt for transparency, involving full disclosure.[156] She can make the grounds of and the phases followed to reach her conclusion fully accessible. Enabling others to follow every single step of her reasoning can render her opinion verifiable and, thus, worthy

[145] Zdenko Kodelja, 'Authority, the Autonomy of The University, and Neoliberal Politics' (2013) 63(3) Educational Theory 317, 323 <https://doi.org/10.1111/edth.12026> accessed 5 October 2019.

[146] Arie Kruglanski and others, 'Says Who?: Epistemic Authority Effects in Social Judgment' (2005) 37 Advances in Experimental Social Psychology 345, 351 <https://doi.org/10.1016/S0065-2601(05)37006-7> accessed 5 October 2019; Damian Leszczyński, 'Inconsistency, Uncertainty and Epistemic Authority' (2014) 6(4) European Journal for Philosophy of Religion 145, 149 <http://search.ebscohost.com/login.aspx?direct=true&db=lsdar&AN=ATLAiG0V180731001456&site=ehost-live> accessed 5 October 2019.

[147] Jos Hornikx, 'Epistemic Authority of Professors and Researchers: Differential Perceptions by Students from Two Cultural-Educational Systems' (2011) 14(2) Social Psychology of Education 169, 170 <https://doi.org/10.1007/s11218-010-9139-6> accessed 5 October 2019.

[148] Robert Pierson, 'The Epistemic Authority of Expertise' (1994) 1 PSA 398, 399 <https://www.jstor.org/stable/193044> accessed 5 October 2019.

[149] Pamela Reed, 'Epistemic Authority in Nursing Practice vs. Doctors' Orders' (2016) 29(3) Nursing Science Quarterly 241 <https://doi.org/10.1177/0894318416647356> accessed 5 October 2019; Michel Croce, 'Epistemic Paternalism and the Service Conception of Epistemic Authority' (2018) 49(3) Metaphilosophy 305, 315 <https://doi.org/10.1111/meta.12294> accessed 5 October 2019.

[150] Adam James Roberts, 'Epistemic Authority and Genuine Ethical Controversies' (2017) 31(4) Bioethics 321 <https://doi.org/10.1111/bioe.12341> accessed 5 October 2019; Jamie Carlin Watson, 'The Shoulders of Giants: A Case for Non-Veritism about Expert Authority' (2018) 37(1) Topoi 39, 43 <https://doi.org/10.1007/s11245-016-9421-0> accessed 5 October 2019.

[151] Arie Kruglanski and others, 'Says Who?' (n 146) 353.

[152] For a discussion on experts as epistemic authorities testifying before courts, see: Tony Ward, 'Expert Testimony, Law and Epistemic Authority' (2017) 34(2) Journal of Applied Epistemology 263 <https://doi.org/10.1111/japp.12213> accessed 5 October 2019.

[153] European Court of Human Rights, 'Guide on Article 6 of the European Convention on Human Rights: Right to a Fair Trial (Criminal Limb)' (Council of Europe/European Court of Human Rights 2019) para 147 <https://www.echr.coe.int/Documents/Guide_Art_6_criminal_ENG.pdf> accessed 5 October 2019.

[154] Robert Pierson, 'The Epistemic Authority of Expertise' (n 148) 400.

[155] Thomas Simpson, 'Telepresence and Trust: A Speech-Act Theory of Mediated Communication' (2017) 30(4) Philosophy & Technology 443, 448 <https://doi.org/10.1007/s13347-016-0233-3> accessed 5 October 2019.

[156] Tal Zarsky, 'Transparency in Data Mining: From Theory to Practice' in Bart Custers and others (eds), *Discrimination and Privacy in the Information Society: Data Mining and Profiling in Large Databases* (Springer 2013) 301, 312 <https://doi.org/10.1007/978-3-642-30487-3_17> accessed 5 October 2019; Matteo Turilli and Luciano Floridi, 'The Ethics of Information Transparency' (2009) 11(2) Ethics and Information Technology 105, 106 <https://doi.org/10.1007/s10676-009-9187-9> accessed 5 October 2019.

of trust.[157] Finally, how other professionals see her may play a decisive role in appointing her to testify. If other experts believed she was reliable, she could be chosen by reason of her good reputation.[158] She could have her value measured on the basis of her past behaviour; she could then be expected to engage in good conduct and provide credible information.[159]

The above health professional can be regarded as capable of doing what all people would do, if they were better at getting knowledge. She can, thus, be seen as an advanced 'version' of lay people.[160] As such, an epistemic authority can be trusted by those seeking for expertise, reasonableness or correctness.[161] This way, trust can lead to knowledge, whereas its absence may result in ignorance.[162] This trusting for acquiring knowledge from sources beyond one's conscience allows for an understanding of epistemic authority as 'the highest court of rational appeal'[163] or, as the next section stresses, the court of optimally 'rational appeal'.

§III.4. In a Quest for Optimal Rationality

Law, reflecting authority, can refer to rules governing and made by the people.[164] It involves both reason and fiat.[165] Understood in terms of reason, law can be seen as epistemic authority that directs one's reasoning and is accepted as legitimate on the basis of its expertise.[166] From this perspective, law, seeking for fundamental principles, like justice and fairness, enables human judgement to discover such principles.[167] At the same time, law, as fiat, as made by humans, involves decisionist authority.[168] Like epistemic, decisionist authority directs one's conduct and is regarded as legitimate.[169] Yet the reason for its legitimation is not related to the belief that the expert is capable of making correct decisions; rather, it is legitimised on grounds irrelevant to the very decision (eg, on the basis of procedural fairness).[170] One may therefore respect the authority and its decisions, regardless of whether or not the outcome of

---

[157] Juan Durán and Nico Formanek, 'Grounds for Trust: Essential Epistemic Opacity and Computational Reliabilism' (2018) 28(4) Minds and Machines 645, 649ff <https://doi.org/10.1007/s11023-018-9481-6> accessed 5 October 2019.

[158] Dan Sperber and others, 'Epistemic Vigilance' (2010) 25(4) Mind and Language 359, 381 <https://doi.org/10.1111/j.1468-0017.2010.01394.x> accessed 5 October 2019.

[159] Gloria Origgi, 'A Social Epistemology of Reputation' (2012) 26(3-4) Social Epistemology 399, 401 <https://doi.org/10.1080/02691728.2012.727193> accessed 5 October 2019; Francesco Martini, 'Hearsay Viewed Through the Lens of Trust, Reputation and Coherence' (2017) 194(10) Synthese 4083, 4088 <https://doi.org/10.1007/s11229-016-1128-7> accessed 5 October 2019.

[160] Charity Anderson, 'Epistemic Authority and Conscientious Belief' (2014) 6(4) European Journal for Philosophy of Religion 91, 95 <https://philarchive.org/archive/ANDEAA-3> accessed 5 October 2019.

[161] Pascal Engel, 'Is Epistemic Agency Possible?' (2013) 23(1) Philosophical Issues 158, 160 <https://doi.org/10.1111/phis.12008> accessed 5 October 2019.

[162] Robert Pierson, 'The Epistemic Authority of Expertise' (n 148) 400.

[163] John Hardwig, 'Epistemic Dependence' (1985) 82(7) The Journal of Philosophy 335, 342 <http://www.jstor.org/stable/2026523> accessed 5 October 2019.

[164] Helen Silving, 'The Twilight Zone of Positive and Natural Law' (1955) 43(3) California Law Review 477, 489 <https://doi.org/10.15779/Z38D20X> accessed 5 October 2019; Lon Fuller, 'Reason and Fiat in Case Law' (1946) 59(3) Harvard Law Review 376, 387 <https://www.jstor.org/stable/1335588> accessed 5 October 2019.

[165] Lon Fuller, 'Reason and Fiat in Case Law' (n 164) 376ff; Jacob Weinrib, *Dimensions of Dignity: The Theory and Practice of Modern Constitutional Law* (Cambridge University Press 2016) 12.

[166] Arie Rosen, 'Two Logics of Authority in Modern Law' (2014) 64(5) University of Toronto Law Journal 669, 675ff <https://heinonline.org/HOL/P?h=hein.journals/utlj64&i=679> accessed 5 October 2019; John Finnis, *Natural Law and Natural Rights* (2nd edn, Oxford University Press 2011) 284ff.

[167] Jeremy Miller, 'The Science of Law: The Maturing of Jurisprudence into Fundamental Principles in Fairness' (1986) 13(2) Western State University Law Review 367, 375, 411 <https://heinonline.org/HOL/P?h=hein.journals/wsulr13&i=373> accessed 5 October 2019.

[168] Arie Rosen, 'Two Logics of Authority in Modern Law' (n 166) 670, 700.

[169] Arie Rosen, 'Two Logics of Authority in Modern Law' (n 166) 700.

[170] Arie Rosen, 'Two Logics of Authority in Modern Law' (n 166) 674.

due processes is right.[171] The interplay of epistemic and decisionist routes can become apparent when applying and interpreting law.

As already mentioned, the rule of law demands certainty and offers trust in predictability.[172] Namely, where law is applied by courts, there is some confidence that the judge will follow precedent and apply the appropriate laws to the particular case before her. Yet there may be a case to which existing laws and previous cases seem neither relevant nor applicable. In such a case, the judge does not decide on the basis of her morality. For she represents the judicial system and delivers the judgment as court; she is bound by the law, not by her own personal beliefs and desires.[173] Therefore, she must find how existing laws, including case law, can be best comprehended and, perhaps dynamically, interpreted and what these laws can tell about the particular case before her.[174] This can be seen as a quest for justice, a search for principles that may be neither clearly defined nor explicitly addressed by laws.[175]

In such cases, the judge is given discretion to identify and interpret these principles in the way that is, in her (ie, the court's) view, the most appropriate.[176] To do so, the judge must not exceed the limits of her discretion; rather, she has to strike a fair balance between the duty to be independent and the duty to respect precedent. On the one hand, she has to stay within the boundaries set out by judicial independence and not become arbitrary; and, on the other hand, she must follow previous decisions, but not mechanically apply them to the case before her.[177] This quest reveals that epistemic expertise, within the context of the rule of law and in particular relation to public authorities, is strongly associated with the integrity and professional qualifications of the authority who is given discretion and undertakes the reasoned quest for justice and fairness.

This quest can be successfully accomplished, for it is accompanied by fair procedures that decisionist authority suggests. For instance, procedural safeguards in various stages can support the independence of the judiciary. Regardless of how a judge is selected, eg appointed or elected, her selection is based upon her integrity and professional qualifications.[178] Such selection criteria, taken together with, among others, the guarantee of tenure or stability of salary, can ensure freedom from external factors that could prejudice independence.[179] Safeguards, provided for by the way the judiciary is institutionalised, include further independence-related guarantees that are well-embedded within procedures, from openness of the hearing process to lack of partiality or absence of inappropriate influence when adjudicating.[180]

---

[171] Arie Rosen, 'Two Logics of Authority in Modern Law' (n 166) 674.

[172] Christopher May, 'Market Exchange and the Rule of Law: Confidence in Predictability' (2018) 10(2) Hague Journal on the Rule of Law 365, 385 <https://doi.org/10.1007/s40803-017-0067-9> accessed 5 October 2019.

[173] Jeremy Waldron, 'Stare Decisis and the Rule of Law' (n 134) 3, 16.

[174] Jeremy Waldron, 'Stare Decisis and the Rule of Law' (n 134) 15.

[175] Joseph Raz, 'Legal Principles and the Limits of Law' (1972) 81(5) Yale Law Journal 823, 847 <https://heinonline.org/HOL/P?h=hein.journals/ylr81&i=841> accessed 5 October 2019.

[176] Joseph Raz, 'Legal Principles and the Limits of Law' (n 175) 848.

[177] Frank Emmert, '*Stare Decisis*: A Universally Misunderstood Idea' (2012) 6(2) Legisprudence 207, 208 <https://heinonline.org/HOL/P?h=hein.journals/legisp6&i=207> accessed 5 October 2019.

[178] Office of the High Commissioner for Human Rights, *Human Rights in the Administration of Justice: A Manual on Human Rights for Judges, Prosecutors and Lawyers* (United Nations 2003) 123.

[179] Office of the High Commissioner for Human Rights, *Human Rights in the Administration of Justice* (n 178) 127-128.

[180] Joseph Raz, *The Authority of Law* (n 132) 216-217; Brian Tamanaha, 'A Concise Guide to the Rule of Law' (n 135) 14.

This analysis provides useful insights into how decision-making is explicated. The judge must justify her quest for justice.[181] Litigants accept her authority, for they acknowledge her capacity to explain decisions. Yet the judge does not give reasons to prove her skills, as can be the case with epistemic authorities outside the public sphere (eg, the above health professional testifying before court). Rather, the judge justifies decisions to prove compliance with law; and, where no case law seems applicable to a particular case, she must explain why the peculiar facts of that case are such that make predictability fail.[182] In such a case, she must use her discretion to understand and interpret existing laws in the way that her integrity and professional qualifications consider as the most appropriate. The above epistemic aspects are aided by the decisionist role, requiring adherence to fair and open processes. This particular understanding of law in terms of how it is applied, justified and interpreted can be fruitful to examine how optimal accuracy can be met in judicial decision-making.

In general, a judge is required to be independent and unbiased.[183] Even though an impartial judge can apply the suitable rules, which she rightly interprets,[184] there could always be some space for bias. This could undermine fair process and the accuracy of its results.[185] The right to fair procedures, guaranteeing some minimum standards that could allow for correct decision-making, exists in many jurisdictions.[186] Yet there is no right to the ideal process that would in all cases guarantee the absolutely accurate decision.[187] The goal seems to be that of diminishing injustices in particular cases, rather than achieving complete justice in any scenario.[188] One might argue that such perfect decision-making could only be performed by an absolutely unbiased judge, who would be armed with complete knowledge of and expertise on everything.[189] But it seems that there is no such judge; nor is there any such person. The ideal and completely unbiased judge seems to be a mythical hero.[190]

Like all humans, judges carry biases. It would be unreasonable to demand that judges should abandon their feelings and experiences, reject social relations and have no life outside

---

[181] Jeremy Miller, 'The Science of Law' (n 167) 411.

[182] Steve Wexler, 'Discretion: The Unacknowledged Side of Law' (1975) 25 University of Toronto Law Journal 120, 152 <https://heinonline.org/HOL/P?h=hein.journals/utlj25&i=124> accessed 5 October 2019.

[183] See in general: Office of the High Commissioner for Human Rights, *Human Rights in the Administration of Justice* (n 178) 113-146; Ola Johan Settem, *Applications of the 'Fair Hearing' Norm in ECHR Article 6(1) to Civil Proceedings: With Special Emphasis on the Balance between Procedural Safeguards and Efficiency* (Springer 2016) 1-11; Diego Papayannis, 'Independence, Impartiality and Neutrality in Legal Adjudication' (2016) 28 Revus Journal for Constitutional Theory and Philosophy of Law 33 <http://journals.openedition.org/revus/3546> accessed 5 October 2019.

[184] Donald Hermann, 'The Fallacy of Legal Procedure as Predominant over Substantive Justice: A Critique of the Rule of Law in John Rawls' *A Theory of Justice*' (1974) 23(4) DePaul Law Review 1408, 1416 <https://heinonline.org/HOL/P?h=hein.journals/deplr23&i=1424> accessed 5 October 2019.

[185] Judith Meierhenry, 'The Due Process Right to an Unbiased Adjudicator in Administrative Proceedings' (1991) 36(3) South Dakota Law Review 551, 554 <https://heinonline.org/HOL/P?h=hein.journals/sdlr36&i=563> accessed 5 October 2019.

[186] Denis Galligan, *Due Process and Fair Procedures: A Study of Administrative Procedures* (Oxford University Press 1997) 68ff, 77ff <http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780198256762.001.0001/acprof-9780198256762> accessed 5 October 2019.

[187] T R S Allan, 'Procedural Fairness and the Duty of Respect' (1998) 18(3) Oxford Journal of Legal Studies 497, 514 <https://heinonline.org/HOL/P?h=hein.journals/oxfjls18&i=507> accessed 5 October 2019.

[188] Donald Hermann, 'The Fallacy of Legal Procedure as Predominant over Substantive Justice' (n 184) 1414.

[189] John Kane, 'Justice, Impartiality, and Equality: Why the Concept of Justice Does Not Presume Equality' (1996) 24(3) Political Theory 375, 377, 382 <https://www.jstor.org/stable/191918> accessed 5 October 2019.

[190] Gretchen Carpenter, 'Judiciaries in the Spotlight' (2006) 39(3) Comparative and International Law Journal of Southern Africa 361, 376 <https://heinonline.org/HOL/P?h=hein.journals/ciminsfri39&i=369> accessed 5 October 2019.

the courtroom.[191] Seeking for completely unbiased judges could result in disqualifying everyone.[192] As no human knows everything, judges need not and should not know everything to decide on cases. This concept can be captured in Čapek's tale 'The Last Judgment'.[193] A deceased criminal is heard before human judges, who are to decide on his fate. God testifies before the tribunal to support the deceased. But human judges condemn the criminal. Before serving the sentence, the deceased asks god 'why don't You Yourself do the judging?' and god replies 'Because I know everything (…) If judges knew everything (…) they couldn't judge either'.[194] This tale is often quoted to exemplify humans' inability to be perfect.[195]

Even though human perfection seems impossible and, most probably, undesirable, in case of judicial decision-making, some form of quasi-perfection or some particularly high standards of accuracy may be needed. For the judiciary is believed to be different from other public decisionmakers in the sense that peculiar impartiality is needed to decide on the basis of the particular facts of each case.[196] People, whose values and beliefs are reflected by the judicial decision, accept the judge as the authority that complies with the rule of law and applies, justifies and interprets law to serve society and the public interest.[197] The judge's decision is accepted as legitimate as long as and to the degree that it represents the people, the real basis of all judge's deeds.[198] People's expectations can be fulfilled, insofar as the judge minimises partiality and imperfection, to the extent that she becomes optimally rational. Such optimal rationality can be achieved, where judges fulfil their epistemic and decisionist duties; where they sufficiently justify the decision-making and adhere to fair procedures.[199]

The duty to justify decisions can be fulfilled where the judge, after having fully considered the peculiar facts of each case, explains the decision-making in reasoned and intelligible ways and in terms of acceptable principles.[200] Her training and experience can enable the judge to disinterestedly make decisions;[201] and her particular expertise, ie her integrity and professional qualifications allowing for compliance with law, can make her

---

[191] Theodor Meron, 'Judicial Independence and Impartiality in International Criminal Tribunals' (2005) 99(2) The American Journal of International Law 359, 365 <https://doi.org/10.2307/1562502> accessed 5 October 2019; Stephen Lee, 'Impartiality in the Judiciary' (1987) 14(2) The University of Queensland Law Journal 136, 137 <http://classic.austlii.edu.au/au/journals/UQLawJl/1987/13.pdf> accessed 5 October 2019; J M G Sweeney, 'Lord O'Brien's Doctrine of Bias' (1972) 7(1) Irish Jurist 17, 18 <https://heinonline.org/HOL/P?h=hein.journals/irishjur7&i=23> accessed 5 October 2019.

[192] Martin Redish and Lawrence Marshall, 'Adjudicatory Independence and the Values of Procedural Due Process' (1986) 95(3) The Yale Law Journal 455, 492 <https://doi.org/10.2307/796487> accessed 5 October 2019.

[193] Karel Čapek, *Tales from Two Pockets* (Catbird Press 1994) 159ff.

[194] Karel Čapek, *Tales from Two Pockets* (n 193) 163-164.

[195] Daniel Solove, *The Future of Reputation: Gossip, Rumor, and Privacy on the Internet* (Yale University Press 2007) 67.

[196] Stephan Grimmelikhuijsen and Albert Klijn, 'The Effects of Judicial Transparency on Public Trust: Evidence from a Field Experiment' (2015) 93(4) Public Administration 995, 996 <https://doi.org/10.1111/padm.12149> accessed 5 October 2019.

[197] Laverne Jacobs, 'From Rawls to Habermas: Towards A Theory of Grounded Impartiality in Canadian Administrative Law' (2014) 51(2) Osgoode Hall Law Journal 543, 573 <https://digitalcommons.osgoode.yorku.ca/ohlj/vol51/iss2/5/> accessed 5 October 2019; Kate Malleson, 'Safeguarding Judicial Impartiality' (2002) 22(1) Legal Studies 53, 70 <https://doi.org/10.1111/j.1748-121X.2002.tb00579.x> accessed 5 October 2019.

[198] Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (n 27) 721.

[199] Donald Hermann, 'The Fallacy of Legal Procedure as Predominant over Substantive Justice' (n 184) 1415.

[200] John Rawls, 'Outline of a Decision Procedure for Ethics' (1951) 60(2) The Philosophical Review 177, 186-187 <https://www.jstor.org/stable/2181696> accessed 5 October 2019.

[201] Stephen Lee, 'Impartiality in the Judiciary' (n 191) 136; Donald Hermann, 'The Fallacy of Legal Procedure as Predominant over Substantive Justice' (n 184) 1432-1433.

become aware, or aim to become aware,[202] of her biases, which she must address when performing the judicial reasoning.[203] To fight against her own partiality, the judge can practice dialoguing with non-experts;[204] or with experts whose opinions can work as epistemic audit.[205] This epistemic role of the judge is supported by the decisionist duty to adhere to fair procedures. The latter are seen as fair, where an individual is given voice and fully enjoys her right to be heard by an impartial judge, who respects her dignity by taking into full account the peculiar facts of her case.[206] Such voice and genuine possibilities to exercise the right to a fair hearing are given, where, eg, a judge carefully listens to the litigants' claims in open processes that subject decision-making to appeal and public scrutiny.[207]

Hence, the combination of epistemic and decisionist authority allows for decisions that, though not perfect, are the most likely to be accurate.[208] This way, subjectivity, partiality and imperfection can to a great extent be minimised; inequalities that would otherwise emerge in each particular case can be diminished. Competent judges with optimal reasonableness and knowledge would most probably be the ones whom all litigants would wish to decide on their cases.[209] They are the optimally rational adjudicators.

§III.5. Data Driven Exercise of Judicial Authority

So far, it has been argued that authority, as a form of power, involves the capacity to peculiarly affect someone. As legitimate power, it is accepted insofar as it complies with law and to the extent that it represents its grounds and basis, ie the people. Since trust can be hardly conferred for each and every decision taken, there is presumption of trust. People make their plans, as if public authorities were compliant with law and acted for the people's benefit. The discussion on epistemic authorities reveals that expertise –in the sense of skills and knowledge– is believed to be involved, where authority is exercised over, yet for the benefit of, the people. In the judicial context, this expertise can be understood in terms of integrity and professional qualifications on the part of the judge who exercises discretional power. Finally, by justifying decisions and adhering to fair procedures, the judge can achieve optimal rationality. The above features of authority can be applied to decision-making sentencing courts delegate to private data driven technologies.

As discussed in chapter II, such decision-making seriously affects individuals. Judicial decisions, based on data driven risk assessments, can deprive the accused of her freedom. Such impact becomes more apparent, where the alleged infringer cannot contest the validity of data driven evidence or where biased predictive models suggest high likelihoods of reoffending on

---

[202] John Rawls, 'Outline of a Decision Procedure for Ethics' (n 200) 179.

[203] Gleider Hernández, *The International Court of Justice and the Judicial Function* (Oxford University Press 2014) 154-155 <https://doi.org/10.1093/acprof:oso/9780199646630.001.0001> accessed 5 October 2019.

[204] Jens Schovsbo, Thomas Riis and Clement Salung Petersen, 'The Unified Patent Court: Pros and Cons of Specialization - Is There a Light at the End of the Tunnel (Vision)?' (2015) 46(3) International Review of Intellectual Property and Competition Law 271, 274.

[205] Susann Wagenknecht, 'Facing the Incompleteness of Epistemic Trust: Managing Dependence in Scientific Practice' (2015) 29(2) Social Epistemology 160, 170-171 <https://doi.org/10.1080/02691728.2013.794872> accessed 5 October 2019.

[206] Tom Tyler, 'Procedural Justice and the Courts' (2004) 44 Court Review 26, 30; Renée Mitchell and Kendall Zoller, 'Dynamic Presence rather than Command Presence: How Communicative Intelligence Influences Police/Citizen Interactions' in Anthony Normore, Mitch Javidi and Larry Long (eds), *Handbook of Research on Strategic Communication, Leadership, and Conflict Management in Modern Organizations* (IGI Global 2019) 255, 260ff.

[207] Office of the High Commissioner for Human Rights, *Human Rights in the Administration of Justice* (n 178) 262ff.

[208] John Rawls, 'Outline of a Decision Procedure for Ethics' (n 200) 179, 183.

[209] John Rawls, 'Outline of a Decision Procedure for Ethics' (n 200) 180.

a discriminatory basis. This tremendously affects defendants, who may be completely unaware of the very existence of the private technology or who can neither access nor contest its data driven rationale. Worse, judicial authority can be exercised on the grounds of data, whose accuracy is verified neither by the court, using the technology, nor by the private actor, controlling the data driven model.

Furthermore, data driven decision-making involves expertise equal to or better than that of intuitive thinking.[210] As this decision-making becomes necessary part of judicial procedures, its expertise resembles that of the judge exercising discretional power. For the role delegated to data driven models is that which was previously performed by the judge –who would evaluate the defendant. When making such decisions, judges are presumed to be trusted.[211] They are public authorities, whose legitimacy is based on their compliance with law and dependent upon their acceptance by the people, by those to whom decisions must be justified. That decisions were delegated to private technologies does not alter their public nature; nor does it negate the impact that such decisions have on people. Where decision-making moves away from public actors, but has exactly the same factual and legal impact on individuals, it would be fair to demand that it be bound by mechanisms to which public actors (here, judges) would be subjected, if they made these decisions.[212]

As indispensable part of the public authority exercised by the judge, data driven decision-making can and should fulfil the epistemic and decisionist functions to achieve optimal rationality and fairness. Aimed at evaluating the accused, data driven decision-making is a task previously performed by a judge, but also evidence and process with substantial role that can be decisive for the judgment and work as substitute for the judicial reasoning. As evidence, such decision-making must be subject to evaluation by the accused;[213] as part of the process and the public hearing, it must be accessible to the alleged offender and the public;[214] and as phase of, or substitute for, the judicial reasoning, it must allow for the provision of adequate reasons to ensure that, eg, the judgment was not manipulated.[215] If such requirements are not met, the right to be fairly heard by an impartial judge can be jeopardised. Therefore, there is an acute need for justifications and compliance with fair procedures, where these technologies are used in the course of exercising judicial authority.

A human approach to data driven decision-making can fulfil this need. As already discussed, the perfect judge, freed from any bias, is a myth. Yet some truth can be hidden in every myth.[216] In a quest for such truth, legal systems allowed for the interplay of epistemic and decisionist roles to reach optimal rationality. In case of data driven technologies, imperfection and partiality have been repeatedly reported in literature.[217] This seems hardly surprising;

---

[210] Zoe Hilton, Grant Harris and Marnie Rice, *Risk Assessment for Domestically Violent Men: Tools for Criminal Justice, Offender Intervention, and Victim Services* (American Psychological Association 2010) 28-31.

[211] For a discussion on presumption of trust in the state-citizen relationship, see: Evan Fox-Decent, *Sovereignty's Promise: The State as Fiduciary* (Oxford University Press 2011) 89-112.

[212] Catherine Donnelly, 'Leonard Cheshire Again and Beyond: Private Contractors, Contract and s.6(3)(b) of the Human Rights Act' (2005) 4 Public Law 785, 787.

[213] Office of the High Commissioner for Human Rights, *Human Rights in the Administration of Justice* (n 178) 257, 306.

[214] Office of the High Commissioner for Human Rights, *Human Rights in the Administration of Justice* (n 178) 262.

[215] Office of the High Commissioner for Human Rights, *Human Rights in the Administration of Justice* (n 178) 135.

[216] Umberto Galimberti, 'Man in the Age of Technology' (2009) 54(1) Journal of Analytical Psychology 3, 5 <https://doi.org/10.1111/j.1468-5922.2008.01753.x> accessed 5 October 2019.

[217] See in general: Cathy O'Neil, *Weapons of Math Destruction* (n 13).

artificially intelligent technologies, aiding and enhancing contemporary data driven rationales, have from the very beginning been aimed at thinking in the same way as humans;[218] as rarely transparent, not always intelligible and often partial humans.[219]

In both human and data driven decision-making unwanted risks can emerge. There have been cases where judges acted for their own benefit or let justice be done secretly;[220] and there have been situations where data driven models treated inaccurate data as representative.[221] Were the paradigm of the optimally rational judge applied to data driven decision-making, the latter would be (demanded to be) justified, interpreted and subjected to scrutiny and audit.[222] From a technical perspective, optimally sufficient justifications and reasons could and can be given. Namely, post-hoc interpretations or pedagogical/local explanations techniques have been suggested to explicate, to an optimal degree, opaque data driven decision-making.[223] Reverse engineering and similar investigative practices can also offer insights necessary for overcoming important obstacles to comprehending data driven rationales.[224] Such technical approaches can be further supported by open-algorithm projects that allow for scrutiny and audit.[225]

Hence, technical measures, promoting reasoned justifications, and open processes, enhancing scrutiny and audit, can allow for optimal levels of rationality and fairness. Even though such measures and processes could (or should primarily) be applied, where sentencing courts delegate decisions to private data driven technologies, they are not. For there is no mechanism to subject private technologies to public systems of checks and balances. However, as data driven decision-making becomes exercise of judicial authority, the introduction of such a mechanism can be justified. It would satisfy the need to guarantee that these models treat people as citizens, who can fully enjoy and exercise their fundamental rights; not as consumers involved in marketplace-like situations.

§III.6. Conclusion

Data driven technologies are becoming impressively intelligent. They seem to move fast from lower to higher levels of the pyramid 'data-information-knowledge-wisdom'.[226] Yet

---

[218] Diego Rasskin-Gutman, *Chess Metaphors: Artificial Intelligence and the Human Mind* (MIT Press 2009) 62; Samir Chopra and Laurence White, *A Legal Theory for Autonomous Artificial Agents* (n 77) 5.

[219] For limitations of the human mind, see: Zoltan Torey, *The Conscious Mind* (MIT Press 2014) 88ff <http://cognet.mit.edu/book/conscious-mind> accessed 5 October 2019; Katherine Puddifoot, 'A Defence of Epistemic Responsibility: Why Laziness and Ignorance Are Bad after All' (2014) 191(14) Synthese 3297, 3301 <https://doi.org/10.1007/s11229-014-0445-y> accessed 5 October 2019.

[220] David Williams, 'Bias; The Judges and the Separation of Powers' (2000) 2000(1) Public Law 45, 59; Michele Benedetto Neitz, 'Socioeconomic Bias in the Judiciary' (2013) 61(1) Cleveland State Law Review 137, 140 <https://heinonline.org/HOL/P?h=hein.journals/clevslr61&i=141> accessed 5 October 2019; J R S Forbes, 'Bias: Pressures on the Watson Test' (1989) 9(3) University of Tasmania Law Review 302, 303 <https://heinonline.org/HOL/P?h=hein.journals/utasman9&i=310> accessed 5 October 2019.

[221] Indrė Žliobaitė and Bart Custers, 'Using Sensitive Personal Data May Be Necessary for Avoiding Discrimination in Data-Driven Decision Models' (2016) 24(2) Artificial Intelligence and Law 183, 184 <https://doi.org/10.1007/s10506-016-9182-5> accessed 5 October 2019.

[222] Eyal Benvenisti, 'Toward Algorithmic Checks and Balances: A Rejoinder' (2018) 29(4) The European Journal of International Law 1087, 1088 <https://doi.org/10.1093/ejil/chy089> accessed 5 October 2019.

[223] Zachary Lipton, 'The Mythos of Model Interpretability' (n 29); Reuben Binns and others, ''It's Reducing a Human Being to a Percentage': Perceptions of Justice in Algorithmic Decisions' (CHI'18, Canada, April 2018) <https://doi.org/10.1145/3173574.3173951> accessed 5 October 2019.

[224] Nicholas Diakopoulos, 'Algorithmic Accountability: Journalistic Investigation of Computational Power Structures' (2015) 3(3) Digital Journalism 398, 403 <http://dx.doi.org/10.1080/21670811.2014.976411> accessed 5 October 2019.

[225] Bruno Lepri and others, 'Fair, Transparent, and Accountable Algorithmic Decision-Making Processes' (n 83) 622-624.

[226] Jennifer Rowley, 'The Wisdom Hierarchy: Representations of the DIKW Hierarchy' (2007) 33(2) Journal of Information Science 163, 164 <https://doi.org/10.1177/0165551506070706> accessed 5 October 2019.

whether or not they can reach the top of this pyramid may be questionable. For they are believed to not need wisdom.[227] Related to acts of benevolence aimed at serving others,[228] wisdom might be absent in data driven rationales. If this is the case, then such technologies may fail to take that which is believed to be at the heart of the notion of wisdom, ie responsibility or the 'will to responsibility'.[229]

The analysis made in this chapter suggests that decision-making, sentencing courts delegate to private data driven technologies, can be treated as exercise of authority, as integral part of the authority the judge exercises. Yet it seems that the technology itself is not the one capable of being held responsible for its decision-making. The treatment of such decision-making as exercise of authority calls for a person bound by the duty to ensure optimal reasonableness and fairness,[230] the duty to sufficiently justify the decision-making,[231] the duty to act for the benefit of others[232] and the duty to pursue other-regarding purposes.[233] That is, a fiduciary duty, a duty of a person who can be (presumed to be) trusted.[234]

Hence, the treatment of such data driven decision-making as exercise of authority can justify the application of fiduciary laws. What remains to be examined is how such laws could be applied to ensure that data driven decisions, sentencing courts delegate to private technologies, would serve the best interests of the people.

---

[227] Shannon Vallor, 'AI and the Automation of Wisdom' in Thomas Powers (ed), *Philosophy and Computing: Essays in Epistemology, Philosophy of Mind, Logic, and Ethics* (Springer 2017) 161, 168 <https://doi.org/10.1007/978-3-319-61043-6_8> accessed 5 October 2019.

[228] Richard Ernst, 'Heading towards a Better World. Part 1: Wisdom, Compassion, and Personal Responsibility' (2016) 98(9) Toxicological & Environmental Chemistry 1084, 1085-1086 <https://doi.org/10.1080/02772248.2015.1134531> accessed 5 October 2019.

[229] Shannon Vallor, 'AI and the Automation of Wisdom' (n 227) 176.

[230] Evan Criddle and Evan Fox-Decent, 'A Fiduciary Theory of Jus Cogens' (n 26) 350.

[231] Evan Fox-Decent, 'The Fiduciary Nature of State Legal Authority' (n 26) 264, 267ff.

[232] Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (n 27) 731.

[233] Paul Miller and Andrew Gold, 'Fiduciary Governance' (2015) 57(2) William & Mary Law Review 513, 540, 548-549 <https://scholarship.law.wm.edu/wmlr/vol57/iss2/4/> accessed 5 October 2019.

[234] Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (n 27) 707; Evan Fox-Decent, 'The Fiduciary Nature of State Legal Authority' (n 26) 294.

IV. THE 'FIDUCIARISATION' OF THE JUDGE

§IV.1. Introduction

The fiduciary concept is most commonly discussed in private contexts. Namely, a physician must serve the interests of her patient, who trusts her that she will recommend the right treatment. This duty to serve the interests of another is the requirement of loyalty, the crux of the fiduciary notion.[235] The physician exercises power over her patient. She can affect him; suggesting a wrong drug can be detrimental to his health. She must prescribe the drug that is the best for his treatment, not the one she receives bonuses for from the pharmaceutical company, whose products she recommends. Moreover, this type of power, exercised by the physician to heal the patient, has been accepted as legitimate since, at least, the era of Hippocrates. Thus, the physician exercises authority (legitimate power) that can affect her patient's important interests (his health); and the patient, trusting the physician, becomes peculiarly vulnerable to her authority –she could recommend the wrong drug. As this chapter analyses, fiduciaries can arise from such trust-like relationships entailing exercise of authority that affects one's interests and renders him peculiarly vulnerable.

From this perspective, a bank robber, who takes hostages and provides them with food, is not a fiduciary. Even though her conduct (providing or denying food) affects the interests of the hostages, who become vulnerable to her power, that power is not authority; it is exercised in the illegal context of robbing a bank and taking hostages. In a legitimate scenario, a parent feeding her triplet babies can be seen as a fiduciary. It can be assumed that the parent has one feeding bottle of milk. If she feeds one triplet, the interests of the other two will be prejudiced. To serve the interests of all triplets, she has to reasonably and fairly distribute milk so that all receive one third. Here, the duty of loyalty means reasonableness and fairness in serving the interests of all triplets. As this chapter argues, this can be the case with beneficiaries involved in one-to-many relations. For instance, a fiduciary, trusted by investors to manage their assets, can serve the trustors' best interests by reasonably and fairly distributing profits.

This chapter discusses the fiduciary idea in the public realm. It stresses that, even though one-to-many relations are almost always the case with a public authority that can affect many individuals, not all public actors can qualify as public fiduciaries. Furthermore, since public authorities are already bound by the duty of reasonableness and fairness, the chapter focuses on the judge to detect what the fiduciary conception, or the 'fiduciarisation', of the judge can add to the notion of the rule of law –or the idea of the epistemic and decisionist authorities. Finally, the chapter applies this 'fiduciarisation' to the data driven context, with the ultimate goal of assessing how the fiduciary concept could make data driven decisions sentencing courts delegate to private technologies serve the best interests of the people.

§IV.2. From Believing in Gods to Trusting Authorities

---

[235] Lionel Smith, 'Can We Be Obliged to Be Selfless?' in Andrew Gold and Paul Miller (eds), *Philosophical Foundations of Fiduciary Law* (Oxford University Press 2014) 141, 148, 154, 157.

The fiduciary notion is etymologically linked to 'fides', a term strongly associated with faith,[236] loyalty,[237] trust[238] and confidence.[239] Fides can be found in Latin 'fiducia' and 'fideicommissum'.[240] The former, involving confidence,[241] can be regarded as a 'fiduciary agreement';[242] and the latter, entailing trust,[243] can be seen as something entrusted to and managed by someone for the benefit of the entustor.[244] Perceived as the necessary basis of fairness, justice and well-being,[245] fides was given a divine status; the 'goddess of good faith'.[246] Carrying fruits or grains, she portrayed peace, wealth and the promise that auctoritas in control of resources would fairly and reasonably distribute goods.[247] Therefore, fides was involved in asymmetric relations where authority was trusted to bring reasonableness and fairness.[248] This can reveal a strong link between the fiduciary notion and the concepts of loyalty and trust.[249]

Trust has been discussed in numerous fields, from psychology and political sciences to economics or anthropology.[250] It can be context-dependent and various definitions have been

---

[236] Laurent Waelkens, 'Réflexions sur la Bona Fides et la Mala Fides dans la Tradition du Droit Romain' (2018) 86(1-2) Revue d'Histoire du Droit 1, 7 <https://brill.com/view/journals/lega/86/1-2/article-p1_4.xml> accessed 5 October 2019; Daniel Howard-Snyder, 'Pistis, Fides, and Propositional Belief' (2018) 54(4) Religious Studies 585, 586ff <https://doi.org/10.1017/S0034412517000452> accessed 5 October 2019.

[237] Adam Pažout, 'Roman Pietas and Herod the Great' (2015) 19(1-2) Studia Hercynia 206, 212 <http://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.desklight-3c728f34-268a-4027-b6f9-97b81e9eec39> accessed 5 October 2019; *R v Neil* [2002] SCC 70, para 16 <https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/2012/index.do> accessed 5 October 2019.

[238] Brent Nelson, 'Faith and Sheep's Guts in *Much Ado About Nothing*' (2016) 12(2) Shakespeare 161, 162 <https://doi.org/10.1080/17450918.2014.968607> accessed 5 October 2019; Eric Hamp, 'Fidēs and the Latin 5th Declension' (1997) 74(1) Glotta 54 <https://www.jstor.org/stable/40267040> accessed 5 October 2019.

[239] Remus Valsan, 'Fides, Bona Fides, and Bonus Vir: Relations of Trust and Confidence in Roman Antiquity' (2017) 5 Journal of Law, Religion and State 48, 54-55 <https://doi.org/10.1163/22124810-00501003> accessed 5 October 2019.

[240] Peter Birks, 'Equity in the Modern Law: An Exercise in Taxonomy' (1996) 26(1) Western Australian Law Review 1, 17 <https://heinonline.org/HOL/P?h=hein.journals/uwatlw26&i=21> accessed 5 October 2019.

[241] Christian Morgner, 'Trust and Confidence: History, Theory and Socio-Political Implications' (2013) 36(4) Human Studies 509, 512 <https://doi.org/10.1007/s10746-013-9281-1> accessed 5 October 2019.

[242] Dietmar Schanbacher, 'Fiducia', *Brill's New Pauly, Antiquity Volumes* (English edn, 2006) <http://dx.doi.org/10.1163/1574-9347_bnp_e411460> accessed 5 October 2019.

[243] Thomas Gallanis, 'The contribution of Fiduciary Law' in Lionel Smith (ed), *The Worlds of the Trust* (Cambridge University Press 2013) 388, 389 <https://doi.org/10.1017/CBO9781139505994> accessed 5 October 2019.

[244] David Johnston, 'Theory, Practice, and History: Rudiments' in David Johnston (ed), *The Roman Law of Trusts* (Oxford University Press 1988) 1, 1-2, 9.

[245] E M Atkins, ''Domina et Regina Virtutum': Justice and Societas in "De Officiis"' (1990) 35(3) Phronesis 258, 268, 280 <https://www.jstor.org/stable/4182365> accessed 5 October 2019.

[246] Jesse Benedict Carter, *The Religion of Numa: And Other Essays on the Religion of Ancient Rome* (MacMillan 1906) 25.

[247] Teresa Morgan, *Roman Faith and Christian Faith: Pistis and Fides in the Early Roman Empire and Early Churches* (Oxford University Press 2015) 83.

[248] Remus Valsan, 'Fides, Bona Fides, and Bonus Vir' (n 239) 56.

[249] François Barrière, 'The French Fiducie, or the Chaotic Awakening of a Sleeping Beauty' in Lionel Smith (ed), *Re-Imagining the Trust* (Cambridge University Press 2012) 222.

[250] Roy Lewicki and Barbara Benedict Bunker, 'Trust in Relationships: A Model of Trust and Development and Decline' in Barbara Benedict Bunker and Jeffrey Rubin (eds), *Conflict, Cooperation, and Justice: Essays Inspired by the Work of Morton Deutsch* (Jossey-Bass 1995) 133, 134ff; Edward Glaeser and others, 'Measuring Trust' (2000) 115(3) The Quarterly Journal of Economics 811 <https://doi.org/10.1162/003355300554926> accessed 5 October 2019; Mary Dzindolet and others, 'The Role of Trust in Automation Reliance' (2003) 58(6) International Journal of Human-Computer Studies 697 <https://doi.org/10.1016/S1071-5819(03)00038-7> accessed 5 October 2019.

attributed to it.[251] It has been seen as the core element, the 'chicken soup', of human life[252] or the crux of ideal relationships.[253] Despite its many shapes and sizes, there is some consensus on the significance of trust for human relationships.[254] It is necessary to address uncertainty and vulnerability in numerous fields.[255] As analysed in the previous chapter, citizens trusting the state act as if they knew laws of tomorrow. Trust then enables people to act as if there were no uncertainties.[256] This as-if-feature involves a fiction,[257] the 'most real fiction' where people pretend to be aware of the future, of which they are actually completely ignorant.[258]

Entailing such fiction, trust can overcome complexities and black-boxes;[259] it can address opacity and ignorance.[260] Even though some have discussed trust as a result of predictions and calculations,[261] to others, 'trust begins where prediction ends'.[262] The latter approach assumes that the entrustor is incapable of predicting.[263] Uncertainty, with which trust works,[264] allows for no modelling, no numerical predictions.[265] One relies upon another's conduct;[266] he has

---

[251] Sonja Grabner-Krauter and Ewald Kaluscha, 'Empirical Research in On-line Trust: A Review and Critical Assessment' (2003) 58(6) International Journal of Human-Computer Studies 783, 803 <https://doi.org/10.1016/S1071-5819(03)00043-0> accessed 5 October 2019.

[252] Eric Uslaner, *The Moral Foundations of Trust* (Cambridge University Press 2002) 1; Niklas Luhmann, *Trust and Power* (Wiley 1979) 4.

[253] John Rempel, John Holmes and Mark Zanna, 'Trust in Close Relationships' (1985) 49(1) Journal of Personality and Social Psychology 95, 95ff <https://pdfs.semanticscholar.org/4727/fcf320e6f8c3a8bbd9d7bac22708825f48ad.pdf> accessed 5 October 2019.

[254] Larue Tone Hosmer, 'Trust: The Connecting Link between Organizational Theory and Philosophical Ethics' (1995) 20(2) The Academy of Management Review 379 <https://www.jstor.org/stable/258851> accessed 5 October 2019.

[255] Ashley Fulmer and Michele Gelfand, 'At What Level (and in Whom) We Trust: Trust Across Multiple Organizational Levels' (2012) 38(4) Journal of Management 1167, 1172 <https://doi.org/10.1177/0149206312439327> accessed 5 October 2019; Badredine Arfi, 'Auto-Immunity of Trust Without Trust' (2010) 6(2) Journal of International Political Theory 188, 190, 205 <https://journals.sagepub.com/doi/abs/10.3366/E1755088210000534> accessed 5 October 2019; Sirkka Jarvenpaa and Dorothy Leidner, 'Communication and Trust in Global Virtual Teams' (1999) 10(6) Organization Science 791, 794 <https://doi.org/10.1287/orsc.10.6.791> accessed 5 October 2019.

[256] Badredine Arfi, 'Auto-Immunity of Trust Without Trust' (n 255) 190, 192ff.

[257] Badredine Arfi, 'Auto-Immunity of Trust Without Trust' (n 255) 198.

[258] Esther Keymolen, 'Trust on the Line: A Philosophical Exploration of Trust in the Networked Era' (Doctor Thesis, Erasmus University Rotterdam 2016) 256 <https://repub.eur.nl/pub/93210> accessed 5 October 2019.

[259] Esther Keymolen, 'Trust in the Networked Era: When Phones Become Hotel Keys' (2018) 22(1) Techné: Research in Philosophy and Technology 51 <https://www.pdcnet.org/techne/content/techne_2018_0022_0001_0051_0075> accessed 5 October 2019; Editorial, 'Towards Trustable Machine Learning' (2018) 2 Nature Biomedical Engineering 709 <https://www.nature.com/articles/s41551-018-0315-x> accessed 5 October 2019.

[260] Claus Offe, 'How can we Trust our Fellow Citizens?' in Mark Warren (ed), *Democracy and Trust* (Cambridge University Press 1999) 42, 48.

[261] Ronald Burt and Marc Knez, 'Trust and Third-Party Gossip' in Roderick Kramer and Tom Tyler (eds), *Trust in Organizations: Frontiers of Theory and Research* (SAGE Publications 1996) 68, 70.

[262] David Lewis and Andrew Weigert, 'Trust as a Social Reality' (1985) 63(4) Social Forces 967, 976 <https://www.jstor.org/stable/2578601> accessed 5 October 2019.

[263] Paul Lewis, 'Uncertainty, Power and Trust' (2008) 21 The Review of Austrian Economics 183, 186 <https://doi.org/10.1007/s11138-007-0038-9> accessed 5 October 2019.

[264] Esther Keymolen and Simone van der Hof, 'Can I Still Trust You, My Dear Doll?' (n 16) 4.

[265] Paul Lewis, 'Uncertainty, Power and Trust' (n 263) 187.

[266] Patricia Doney and Joseph Cannon, 'An Examination of the Nature of Trust in Buyer-Seller Relationships' (1997) 61(2) Journal of Marketing 35, 37 <https://www.jstor.org/stable/1251829> accessed 5 October 2019; Allen Milewski and Steven Lewis, 'Delegating to Software Agents' (1997) 46(4) International Journal of Human-Computer Studies 485, 493 <https://doi.org/10.1006/ijhc.1996.0100> accessed 5 October 2019; Shi Ying Lim, Sirkka Jarvenpaa and Holly Lanham, 'Review of Research on Knowledge Transfer in Care Transitions: Trust-Enhancing Principles for Information Systems Design' (48th Hawaii International Conference on System

confidence that her future behaviour will identify with his will.[267] He believes that she will act disinterestedly, honestly and in good faith.[268] She is expected to actually do good, rather than exploit or expose him and his interests.[269] Expected to engage in such good deeds, the entrustee and her conduct can peculiarly affect the entrustor.

Thus, trust addresses asymmetries and is in a positive sense linked to power,[270] the potential impact on someone.[271] Trust can then work with power. Where power is seen as legitimate, trust can work with authority.[272] And it can work with fiduciaries,[273] who are always about authority.[274]

§IV.3. Exploring and Transforming Fiduciary Duties

Courts have been discussing fiduciaries for the past three hundred years.[275] However, what fiduciary means is not always clear. Addressed as 'a taxonomic nightmare',[276] the fiduciary has been understood as a dynamic concept,[277] a notion in a never-ending quest for its

---

Sciences, Kauai, January 2015) 3148, 3149 <https://ieeexplore.ieee.org/document/7070195> accessed 5 October 2019.

[267] Rajiv Sabherwal, 'The Role of Trust in Outsourced IS Development Projects' (1999) 42(2) Communications of the ACM 80 <https://dl.acm.org/citation.cfm?id=293485> accessed 5 October 2019.

[268] Claus Offe, 'How can we Trust our Fellow Citizens?' (n 260) 47ff; Anil Singh and James Teng, 'Enhancing Supply Chain Outcomes through Information Technology and Trust' (2016) 54 Computers in Human Behavior 290, 291 <https://doi.org/10.1016/j.chb.2015.07.051> accessed 5 October 2019.

[269] Inge Sieben and Loek Halman, 'Morality and the Public Good in Post-Socialist European States' (2015) 7(1) Studies of Transition States and Societies 7, 11 <https://research.tilburguniversity.edu/en/publications/morality-and-the-public-good-in-post-socialist-european-states> accessed 5 October 2019; Aneil Mishra, 'Organizational Responses to Crisis: The Centrality of Trust' in Roderick Kramer and Tom Tyler (eds), *Trust in Organizations* (n 261) 261, 276; Haavi Morreim, 'The Clinical Investigator as Fiduciary: Discarding a Misguided Idea' (2005) 33(3) The Journal of Law, Medicine & Ethics 586, 589 <https://doi.org/10.1111/j.1748-720X.2005.tb00521.x> accessed 5 October 2019.

[270] Barbara Wright, 'Power, Trust, and Science of Unitary Human Beings Influence Political Leadership: A Celebration of Barrett's Power Theory' (2010) 23(1) Nursing Science Quarterly 60, 61 <https://doi.org/10.1177/0894318409353794> accessed 5 October 2019.

[271] Ari Heiskanen, Mike Newman and Merja Eklin, 'Control, Trust, Power, and the Dynamics of Information System Outsourcing Relationships: A Process Study of Contractual Software Development' (2008) 17(4) The Journal of Strategic Information Systems 268, 270 <https://doi.org/10.1016/j.jsis.2008.10.001> accessed 5 October 2019.

[272] Jeffrey Bradach and Robert Eccles, 'Price, Authority, and Trust: From Ideal Types to Plural Forms' (1989) 15 Annual Review of Sociology 97, 110ff <https://doi.org/10.1146/annurev.so.15.080189.000525> accessed 5 October 2019.

[273] Edith Brown Weiss, 'The Planetary Trust: Conservation and Intergenerational Equity' (1984) 11(4) Ecology Law Quarterly 495, 499 <http://scholarship.law.georgetown.edu/facpub/334> accessed 5 October 2019.

[274] Paul Miller and Andrew Gold, 'Fiduciary Governance' (n 233) 520.

[275] Lindsay Aagaard, 'Fiduciary Duty and Members of Parliament' (2008) 31(2) Canadian Parliamentary Review 31 <http://www.revparl.ca/31/2/31n2_08e_Aagaard.pdf> accessed 5 October 2019; Andrew Hicks, 'The Remedial Principle of *Keech v. Sandford* Reconsidered' (2010) 69(2) The Cambridge Law Journal 287, 288 <https://doi.org/10.1017/S0008197310000486> accessed 5 October 2019.

[276] Peter Birks, 'Equity in the Modern Law' (n 240) 17-18.

[277] James Hawley, Keith Johnson and Ed Waitzer, 'Reclaiming Fiduciary Duty Balance' (2011) 4(2) Rotman International Journal of Pension Management 4, 7 <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=65592665&site=ehost-live> accessed 5 October 2019.

own theory.[278] It has been linked to discretion,[279] reasonableness,[280] vulnerability[281] or dependency.[282] Established by law or emerging in situations that involve exercise of authority,[283] fiduciary relationships may vary.[284] Yet they are said to exist in trust-like situations,[285] where, at minimum, there is exercise of authority, that can peculiarly affect the interests of a person, who is, thus, particularly vulnerable to that authority.[286]

Trust-like situations, meeting the above indicia, could include the parent-child,[287] the lawyer-client, the psychiatrist-patient[288] or the human-animal relation.[289] In the absence of an exhaustive list, fiduciary laws may cover and regulate relationships, where, eg, one's actions resemble those of a fiduciary[290] or where uncertain terms and conditions can be neither predicted nor pre-agreed.[291] For instance, some have proposed the fiduciary notion to protect future generations from climate change.[292] Others have analysed the status of states or the role of international institutions as 'fiduciaries of humanity' bound by the duty to take responsible actions and make intelligible decisions.[293] Fiduciaries have also been suggested to safeguard impartiality and fairness,[294] where judging is undertaken without the consent of the judged.[295]

New fiduciary relationships can therefore arise to introduce fairness and justice, protect the vulnerable parties and impose strict duties on the powerful. From this perspective, there is some form of solemn, sacred, duty requiring that the one who betrays these trust-like relationships, be it the state betraying the people or the parent betraying her child, be regarded

---

[278] Sir Anthony Mason as cited in: Parker Hood, *Principles of Lender Liability* (Oxford University Press 2012) 234; Rosemary Teele, 'The search for the Fiduciary Principle: A Rescue Operation' (1996) 24(2) Australian Business Law Review 110 <https://search.proquest.com/docview/223522999?accountid=14338> accessed 5 October 2019.

[279] Henry Smith, 'Why Fiduciary Law Is Equitable' in Andrew Gold and Paul Miller (eds), *Philosophical Foundations of Fiduciary Law* (n 235) 261, 275.

[280] Paul Miller, 'Dimensions of Fiduciary Loyalty' in Gordon Smith and Andrew Gold (eds), *Research Handbook on Fiduciary Law* (Edward Elgar Publishing 2018) 180 <https://doi.org/10.4337/9781784714833.00018> accessed 5 October 2019.

[281] Leonard Rotman, 'Trust, Loyalty, and E-Commerce' in Daniel Palmer (ed), *Ethical Issues in E-Business: Models and Frameworks* (IGI Global 2010) 58, 59.

[282] Michelle Harner, 'The Search for an Unbiased Fiduciary in Corporate Reorganizations' (2011) 86(2) Notre Dame Law Review 469, 487 <https://scholarship.law.nd.edu/ndlr/vol86/iss2/1> accessed 5 October 2019.

[283] Joshua Getzler, 'Ascribing and Limiting Fiduciary Obligations' in Andrew Gold and Paul Miller (eds), *Philosophical Foundations of Fiduciary Law* (n 235) 39, 43.

[284] John McCamus, 'Prometheus Unbound: Fiduciary Obligation in the Supreme Court of Canada' (1997) 28(1) Canadian Business Law Journal 104, 108 <https://digitalcommons.osgoode.yorku.ca/scholarly_works/1497/> accessed 5 October 2019.

[285] David Hay, *Words and Phrases Legally Defined, Volume 1* (4th edn, LexisNexis Butterworths 2007) 930.

[286] Himmy Lui, 'A Fiduciary Perspective on the State's Duty to Protect the Environment' (n 24) 105.

[287] Elizabeth Scott and Robert Scott, 'Parents as Fiduciaries' (1995) 81(8) Virginia Law Review 2401 <https://www.jstor.org/stable/1073583> accessed 5 October 2019.

[288] Tamar Frankel, 'Fiduciary Law' (1983) 71(3) California Law Review 795, 796, 811 <https://doi.org/10.15779/Z38W45K> accessed 5 October 2019.

[289] Tamar Frankel, 'Watering down Fiduciary Duties' in Andrew Gold and Paul Miller (eds), *Philosophical Foundations of Fiduciary Law* (n 235) 242, 245.

[290] John Kilgour, 'The Department of Labor's Final Rule on Fiduciary Responsibility' (2015) 47(5-6) Compensation & Benefits Review 232 <https://doi.org/10.1177/0886368716679616> accessed 5 October 2019.

[291] Joseph Warburton, 'Do Fiduciary Duties Matter?' (2011) 11(5) Corporate Governance 541, 542 <https://doi.org/10.1108/14720701111176957> accessed 5 October 2019.

[292] Peter Brown, 'Climate Change and the Planetary Trust' (n 25) 214.

[293] Evan Criddle and Evan Fox-Decent, *Fiduciaries of Humanity* (n 25) 283, 288.

[294] James Hawley, Keith Johnson and Ed Waitzer, 'Reclaiming Fiduciary Duty Balance' (n 277) 8.

[295] For the absence of a duty of (mandatory) consent, see: Robert Flannigan, 'Presumed Undue Influence: The False Partition from Fiduciary Accountability' (2015) 34(2) University of Queensland Law Journal 171, 172 <https://heinonline.org/HOL/P?h=hein.journals/qland34&i=179> accessed 5 October 2019.

as 'the common enemy of every man, woman, and child'.[296] This sanctity suggests a moral understanding of the fiduciary notion to guarantee that the ones exercising authority over others serve the best interests of those others. It is a sanctity strongly related to or directly deriving from the duty of loyalty.

Loyalty has been regarded as one's voluntary commitment and total dedication to a purpose.[297] The loyal fiduciary must act honestly, without opportunism, for the benefit of another.[298] This entails selflessness or 'other regarding';[299] and some have argued for a fiduciary or voluntary society,[300] where trust would be understood in moral terms as inviolable or sacred.[301] Were trust betrayed, fiduciaries would be held 'to something stricter than the morals of the marketplace'.[302] Loyalty requires genuine desire on the part of the fiduciary[303] to act for the benefit of another and actively fulfil her duties intentionally, not by chance.[304] Aiming at commitment and adherence but also at avoiding conflicts of interests,[305] loyal fiduciaries must minimise temptation and act faithfully in the best interests of others.[306] This prevents a fiduciary from being the 'judex in sua causa'.[307]

---

[296] Peter Kinder, 'New Fiduciary Duties in a Changing Social Environment' (2005) 14(3) Journal of Investing 24, 24ff <https://search.proquest.com/docview/220761681?accountid=14338> accessed 5 October 2019.

[297] Josiah Royce, *The Philosophy of Loyalty* (MacMillan 1908) 16-17.

[298] For the duty of devotion, the no-profit rule and the threat of disgorgement, see: George Fletcher, *Loyalty: An Essay on the Morality of Relationships* (Oxford University Press 1993) 41ff, 61ff; Lyman Johnson, 'After *Enron*: Remembering Loyalty Discourse in Corporate Law' (2003) 28 Delaware Journal of Corporate Law 27, 37ff <http://www.djcl.org/wp-content/uploads/2014/08/After-Enron-REMEMBERING-LOYALTY-DISCOURSE-IN-CORPORATE-LAW.pdf> accessed 5 October 2019; I M Jackman, 'Restitution for Wrongs' (1989) 48(2) The Cambridge Law Journal 302 <https://www.jstor.org/stable/4507288> accessed 5 October 2019.

[299] Stephen Young, 'Fiduciary Duties as a Helpful Guide to Ethical Decision-Making in Business' (2007) 74(1) Journal of Business Ethics 1, 2 <https://www.jstor.org/stable/25075439> accessed 5 October 2019.

[300] John Bogle, *Don't Count on It!: Reflections on Investment Illusions, Capitalism, "Mutual" Funds, Indexing, Entrepreneurship, Idealism, and Heroes* (John Wiley & Sons 2011) 98.

[301] Leonard Rotman, *Fiduciary Law* (Thomson Carswell 2005) 2; Mark Blodgett, Linda Melconian and Jason Peterson, 'Social Enterprise: Reaffirming Public Purpose Governance Through Shared Value' (2016) 16(2) Journal of Business & Securities Law 305, 308 <https://digitalcommons.law.msu.edu/jbsl/vol16/iss2/1/> accessed 5 October 2019.

[302] Tamar Frankel, *Trust and Honesty: America's Business Culture at a Crossroad* (Oxford University Press 2006) 115.

[303] Ethan Leib and David Ponet, 'Fiduciary Representation and Deliberative Engagement with Children' (2012) 20(2) The Journal of Political Philosophy 178, 189-190 <https://doi.org/10.1111/j.1467-9760.2011.00398.x> accessed 5 October 2019.

[304] Stephen Galoob and Ethan Leib, 'Intentions, Compliance, and Fiduciary Obligations' (2014) 20(2) Legal Theory 106, 107 <https://doi.org/10.1017/S1352325214000032> accessed 5 October 2019.

[305] Paul Miller, 'A Theory of Fiduciary Liability' (2011) 56(2) McGill Law Journal 235, 257 <https://doi.org/10.7202/1002367ar> accessed 5 October 2019; Matthew Harding, 'Trust and Fiduciary Law' (2013) 33(1) Oxford Journal of Legal Studies 81, 92 <https://doi.org/10.1093/ojls/gqs025> accessed 5 October 2019; Mark Blodgett and Linda Melconian, 'Health-Care Nonprofits: Enhancing Governance and Public Trust' (2012) 117(2) Business and Society Review 197, 205 <https://doi.org/10.1111/j.1467-8594.2012.00405.x> accessed 5 October 2019.

[306] Mary Christina Wood, 'Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part II): Instilling a Fiduciary Obligation in Governance' (2009) 39(1) Environmental Law 91, 99 <https://heinonline.org/HOL/P?h=hein.journals/envlnw39&i=95> accessed 5 October 2019.

[307] Margaret Allars, 'Citizenship Theory and the Public Confidence Rationale for the Bias Rule Reshaping the Judiciary' (2000) 18(1) Law in Context 12, 19 <https://heinonline.org/HOL/P?h=hein.journals/lwincntx18&i=18> accessed 5 October 2019.

The duty of loyalty is at the heart of the fiduciary concept.[308] To Gold, '(f)iduciary relationships require a legal duty of loyalty, full stop'.[309] Importantly, where many beneficiaries are subjected to the same authority, this essential duty of loyalty becomes a duty of reasonableness and fairness.[310] The fiduciary must exercise authority in pursuit of the beneficiaries' goals.[311] To serve potentially competing interests, she must adequately justify her decision-making but also provide for the appropriate safeguards required by procedural fairness.[312] She must disinterestedly act as a trusted authority and make discretionary decisions for the benefit of each vulnerable individual.[313] After having realised the interests of her alter-egos,[314] she can make the fairest possible decision that serves or even furthers these interests.[315]

Another important aspect of the fiduciary notion is the presumption of trust.[316] As long as there is authority that peculiarly affects the interests of vulnerable others, fiduciary relationships can arise, regardless of whether consent was actually obtained.[317] There is no requirement of delegation, as a 'sine qua non' condition, in the fiduciary mechanism.[318] This presumption makes the machinery work, where trust cannot be easily conferred.[319] This resembles the presumption of trust that (public authorities, eg) judges make fair and reasonable decisions in the best interests of the people and that they justify decisions, which are legitimate to the extent that they represent the people, the 'actual ground and foundation' for judicial decision-making.[320]

Aside from presumption of trust, the aspects of reasonableness and fairness are also essential features of public authorities. As the analysis of chapter III demonstrated, a public authority, affecting individuals and rendering them peculiarly vulnerable, is bound by duties of reasonableness and fairness owed to the people, the many classes of beneficiaries (potentially) subjected to and affected by this authority. It could, thus, be argued that there is not just an overlap or an intersection between fiduciaries and public actors; one could claim that all public

---

[308] Lionel Smith, 'Fiduciary Relationships: Ensuring the Loyal Exercise of Judgement on Behalf of Another' (2014) 130 The Law Quarterly Review 608, 609-610 <https://www.westlaw.com/Document/I20895100342211E499A193CC737971DF/View/FullText.html?transitionType=Default&contextData=(sc.Default)&VR=3.0&RS=cblt1.0> accessed 5 October 2019; Paul Miller, 'Justifying Fiduciary Duties' (2013) 58(4) McGill Law Journal 969, 972 <https://www.erudit.org/fr/revues/mlj/2013-v58-n4-mlj0866/1019051ar/> accessed 5 October 2019; 'Justifying Fiduciary Remedies' (2013) 63(4) University of Toronto Law Journal 570 <https://heinonline.org/HOL/P?h=hein.journals/utlj63&i=584> accessed 5 October 2019.

[309] Andrew Gold, 'The Loyalties of Fiduciary Law' in Andrew Gold and Paul Miller (eds), *Philosophical Foundations of Fiduciary Law* (n 235) 176, 190.

[310] Evan Criddle and Evan Fox-Decent, 'A Fiduciary Theory of Jus Cogens' (n 26) 350.

[311] Evan Criddle and Evan Fox-Decent, 'A Fiduciary Theory of Jus Cogens' (n 26) 350.

[312] Evan Fox-Decent, 'The Fiduciary Nature of State Legal Authority' (n 26) 264, 267ff.

[313] Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (n 27) 731; Paul Miller and Andrew Gold, 'Fiduciary Governance' (n 233) 548-549.

[314] Arthur Laby, 'The Fiduciary Obligation as the Adoption of Ends' (2008) 56(1) Buffalo Law Review 99, 103, 135 <https://heinonline.org/HOL/P?h=hein.journals/buflr56&i=107> accessed 5 October 2019.

[315] Deborah DeMott, 'Beyond Metaphor: An Analysis of Fiduciary Obligation' (1988) 1988(37) Duke Law Journal 879, 882 <https://scholarship.law.duke.edu/faculty_scholarship/332/> accessed 5 October 2019.

[316] Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (n 27) 707.

[317] Evan Fox-Decent, 'The Fiduciary Nature of State Legal Authority' (n 26) 294.

[318] Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (n 27) 707.

[319] Ethan Leib and David Ponet, 'Fiduciary Representation and Deliberative Engagement with Children' (n 303) 184-185.

[320] Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (n 27) 721.

authorities are fiduciaries of the people.[321] Yet some clarifications are needed to make the argument for potential public fiduciaries.

§IV.4. Public Fiduciaries and the Fiduciary Judge

The fiduciary concept is derived from private law and, in particular, private trust-like relationships involving exercise of authority that can render the beneficiary particularly vulnerable to the fiduciary. The peculiarities of these indicia, ie authority and vulnerability involved in trust-like relationships, must be taken into due account, if fiduciary duties are to be imposed on public actors.

In private relationships, same fiduciary duties can lead to dissimilar requirements.[322] Namely, in the lawyer-client relation, the duty of loyalty means that, eg, the lawyer must handle a particular case for the benefit of her client by, eg, representing him before court, making her best efforts to support his claims, appointing appropriate witnesses or offering the best possible advice to meet his best interests. In the context of the parent-child relation, the duty of loyalty implies that, among others, the fiduciary parent must undertake all actions that are in the interests of the minor and that the child is incapable of undertaking, from registration at school and regular visits to paediatricians to providing food or clothing. Therefore, the same duty of loyalty comes in many shapes and sizes;[323] it is the particular relationship that defines the content of the fiduciary duty.[324]

This relationship-dependence becomes more apparent when shifting from one-to-one to one-to-many relations. Contrary to the above parent-child and lawyer-client scenarios, in the manager-investors relation, the duty of loyalty requires that the fiduciary, managing investors' assets, reasonably and fairly distribute profits among the many investors.[325] Such one-to-many relations seem to be the case in the public sphere, where a single authority is exercised over many individuals. Here, public authority is held for the benefit of the people, whose interests must be served with reasonableness and evenhandedness.[326] This could allow for the treatment of all public authorities as quasi-private fiduciaries, exercising discretionary power over many individuals, or as sui generis fiduciaries, whose very statehood, resembling fiduciary's legal status, is capable of triggering fiduciary duties.[327]

In any (quasi-private or sui generis) scenario, for public actors to be treated as fiduciaries, they should, first of all, meet the indicia involved in trust-like relationships entailing authority that affects the interests of others and renders them peculiarly vulnerable. Authors, arguing for the fiduciary status of public actors, have specified and delimited these conditions; this seems to narrow down the range of potential public fiduciaries. For example, to Fox-Decent, not all types of authorities, interests and vulnerabilities can meet the fiduciary conditions. Authority must be discretionary and administrative, affect the important interests of the beneficiary and

---

[321] Evan Fox-Decent, 'New Frontiers in Public Fiduciary Law' in Evan Criddle, Paul Miller and Robert Sitkoff (eds), *The Oxford Handbook of Fiduciary Law* (Oxford University Press 2019) 909, 913.

[322] Gordon Smith, 'The Critical Resource Theory of Fiduciary Duty' (2002) 55(5) Vanderbilt Law Review 1399, 1409, 1452ff <https://heinonline.org/HOL/P?h=hein.journals/vanlr55&i=1413> accessed 5 October 2019.

[323] Evan Criddle, 'Liberty in Loyalty: A Republican Theory of Fiduciary Law' (2017) 95(5) Texas Law Review 993, 1042 <https://heinonline.org/HOL/P?h=hein.journals/tlr95&i=1039> accessed 5 October 2019.

[324] Ethan Leib, David Ponet and Michael Serota, 'Translating Fiduciary Principles into Public Law' (2012-2013) 126 Harvard Law Review Forum 91, 93 <https://heinonline.org/HOL/P?h=hein.journals/forharoc126&i=86> accessed 5 October 2019.

[325] Evan Criddle, 'Liberty in Loyalty' (n 323) 1047.

[326] Paul Finn, 'Public Trusts, Public Fiduciaries' (2010) 38(3) Federal Law Review 335, 337, 339, 348, 350 <https://heinonline.org/HOL/P?h=hein.journals/fedlr38&i=343> accessed 5 October 2019.

[327] Paul Miller, 'The Fiduciary Relationship' in Andrew Gold and Paul Miller (eds), *Philosophical Foundations of Fiduciary Law* (n 235) 63, 87-89.

be exercised for the particular purposes that the beneficiary cannot herself achieve.[328] Fox-Decent explicitly adds that such authority must be 'other-regarding, purposive, and institutional'.[329]

These remarks can exclude, among others: self-regarding exercises of power, like one's authority over her own assets; accidental exercises of power not targeted at meeting particular (other-regarding) purposes; or unlawful exercises of power that cannot be institutional.[330] Yet these clarifications hardly affect fiduciary considerations regarding public actors. In general, public authorities do not exercise power for their own benefit. Namely, public power exercised over public land is other-regarding in the sense that it is power exercised over land that belongs to the public, the people. Moreover, public authorities serve particular other-regarding purposes and no public power can be inherently unlawful. In contrast, it seems that public power is by nature institutional and always targeted at serving other-regarding purposes.

What seems to really narrow down the range of emergent public fiduciaries is the requirement that solely the important interests of others constitute the subject of the fiduciary duty.[331] This demand excludes all exercises of public power that do not affect such crucial interests and focuses only on authorities that enjoy a higher degree of public trust.[332] The range of potential public fiduciaries could be further limited to situations, where authority directly, rather than indirectly, affects such crucial interests.[333] From this perspective, the state can be the fiduciary of aboriginals, when it directly affects their important interests, like control over their land. This was the case with the state-Indian relation, where, interestingly, the court acknowledged the fiduciary relationship on the basis of the case's peculiar vulnerabilities and the judge's 'moral judgement', rather than the law.[334] In this example, the state owes fiduciary duties to the Indians, ie those whose forests it controls. However, in public contexts, it may not always be clear to whom fiduciary duties are owed; public power is held for the benefit of the people, who may not be easily identifiable.

The paradigm of the judge can exemplify this issue of identifiability. The judge, holding discretionary power over the crucial interests of others, exercises institutional authority to achieve particular other-regarding goals. Her authority can render individuals peculiarly vulnerable. Namely, after striking a fair balance between individual interests and the public interest, the judge can order a sentencing decision that deprives the accused of his liberty. Here, the vulnerable party seems to be the defendant, whose important interests (eg, liberty) are affected. Yet, at the same time, this sentencing decision serves the interests of society as a whole. For example, by convicting a person engaging in sex offences against minors, the judge keeps all children safe and, by convicting a murderer, she keeps society as a whole safe. If the judge fails to strike a fair balance between the liberty of the sexual exploiter or the murderer (individual interests) and public safety (the public interest), the people (the children or society

---

[328] Evan Fox-Decent, *Sovereignty's Promise* (n 211) 29-30, 93-94.

[329] Evan Fox-Decent, *Sovereignty's Promise* (n 211) 30, 99.

[330] Evan Fox-Decent, *Sovereignty's Promise* (n 211) 96-101.

[331] Evan Fox-Decent, *Sovereignty's Promise* (n 211) 93-94.

[332] Lorne Sossin, 'An Intimate Approach to Fairness, Impartiality and Reasonableness in Administrative Law' (2002) 27(2) Queen's Law Journal 809, 853 <https://heinonline.org/HOL/P?h=hein.journals/queen27&i=821> accessed 5 October 2019.

[333] Paul Miller, 'The Fiduciary Relationship' (n 327) 88.

[334] Gerald Lanning, 'The Crown-Maori Relationship: The Spectre of a Fiduciary Relationship' (1999) 8 Auckland University Law Review 445, 450; Harvard Law Review, 'Rethinking the Trust Doctrine in Federal Indian Law' (1984) 98(2) Harvard Law Review 422, 424-425 <https://www.jstor.org/stable/1340843> accessed 5 October 2019.

as a whole) are those who become vulnerable and whose important interests are affected by the decision.

Hence, in the paradigm of the judge, the people, including and going beyond the litigants of the particular case, can be the beneficiaries whose crucial interests are at stake.[335] These people can also include individuals who are not members of the citizenry. For instance, a Greek citizen, who commits a crime in the Netherlands, may be deprived of her liberty by a Dutch court; and a Dutch court's decision denying maintenance payments by a Dutch parent can affect the important interests of her children, who may be Greek citizens. Therefore, the judge can be deemed as the fiduciary of the people (not just litigants, not just citizens) who are potentially subjected to and affected by her authority. From this point of view, the judge is the fiduciary of the 'citizens of the world'.[336]

Admittedly, this approach makes the beneficiaries a broad group of persons, who would not be easily identified or identifiable. Yet identifying beneficiaries in fiduciary contexts (eg, administration of firms by directors) can be a complex task.[337] Importantly, identifiability of beneficiaries is not needed in some fiduciary relationships. Namely, charitable trusts are aimed at serving the public interest or the interests of an indefinite group of individuals and often lack particular identifiable beneficiaries.[338] Besides, where the public interest is the subject-matter of the fiduciary duty, courts have treated future generations as beneficiaries of today's exercises of public authority.[339]

The above perspectives recommend that identifiability be not a constitutive element of fiduciary relationships. In line with these approaches, it has been suggested that judges can be the fiduciaries (not only of the people, but also) of the law. According to this suggestion, judges exercise authority for particular abstract purposes that meet the requirements of the fiduciary notion.[340] Namely, when applying and interpreting law, judges exercise authority that affects the important interests of the people for the abstract and other-regarding purpose of serving the body of law.[341] Treating judges as fiduciaries of the law can transform the hard task of identifying beneficiaries into a quest for the purposes judicial authority must serve.[342]

As discussed in chapter III, this is a quest the rule of law can address. Features of the rule of law, such as predictability or certainty, require that the judge be compliant with the law and fulfil her duties of reasonableness and fairness. The judge must, at minimum, justify the

---

[335] For an analysis, see: Ethan Leib, David Ponet and Michael Serota, 'A Fiduciary Theory of Judging' (n 27) 719-723; 'Translating Fiduciary Principles into Public Law' (n 324) 95-96.

[336] For the argument that public fiduciary relationships can include non-citizens, see: Evan Criddle and Evan Fox-Decent, 'A Fiduciary Theory of Jus Cogens' (n 26) 380-382; Evan Fox-Decent and Evan Criddle, 'The Fiduciary Constitution of Human Rights' (2009) 15(4) Legal Theory 301, 310 <https://doi.org/10.1017/S1352325210000017> accessed 5 October 2019; Himmy Lui, 'A Fiduciary Perspective on the State's Duty to Protect the Environment' (n 24) 109-110.

[337] See, for example: Paul Miller and Andrew Gold, 'Fiduciary Governance' (n 233) 518.

[338] Browne Lewis, *The Law of Trusts* (eLangdell Press 2013) 201, 237 <https://www.cali.org/sites/default/files/Trusts_Lewis_Dec2014.pdf> accessed 5 October 2019; Luis Kutner and Henry Koven, 'Charitable Trust Legislation in the Several States' (1966) 61(3) Northwestern University Law Review 411 <https://heinonline.org/HOL/P?h=hein.journals/illlr61&i=423> accessed 5 October 2019.

[339] Deborah Musiker, Tom France and Lisa Hallenbeck, 'The Public Trust and *Parens Patriae* Doctrines: Protecting Wildlife in Uncertain Political Times' (1995) 16 Public Land Law Review 87, 96 <https://scholarship.law.umt.edu/cgi/viewcontent.cgi?article=1198&context=plrlr> accessed 5 October 2019.

[340] Paul Miller and Andrew Gold, 'Fiduciary Governance' (n 233) 549, 567-570.

[341] Sarah Cravens, 'Judges as Trustees: A Duty to Account and an Opportunity for Virtue' (2005) 62 Washington and Lee Law Review 1637, 1639-1640 <https://scholarlycommons.law.wlu.edu/wlulr/vol62/iss4/8/> accessed 5 October 2019.

[342] Paul Miller and Andrew Gold, 'Fiduciary Governance' (n 233) 570.

decision-making (as epistemic authority) and adhere to procedural fairness (as decisionist authority). These demands identify with the particular version of the duty of loyalty in the context of one-to-many relations. Hence, the question seems to be what the treatment of the judge as a fiduciary –whether as a fiduciary of the people or as a fiduciary of the law who would in both scenarios affect the people's important interests– can add to the notion of the rule of law.

From a theoretical perspective, the fiduciary conceptualisation of the judge can attach a moral aspect to her legal duty to respect the interests and the dignity of those potentially subjected to and affected by her authority.[343] It can highlight the importance of loyalty in the sense of fidelity to other-regarding purposes.[344] Linking such morality to the judge's legal duties can allow for a better understanding of the people as the justification for and the basis of the judicial power. Moreover, fiduciary laws can introduce sensitivity toward the interests affected by the judicial authority.[345] Being relationship-dependent, fiduciary duties can underpin and remind public trust, which is not always apparent, since it is most often presumed rather than conferred.[346] Having said this, the fiduciary conception can allow to focus on the vulnerable people, who are often incapable or hardly capable of achieving the goals the judge is given discretion to pursue for the benefit of the people.[347] All the above theoretical perspectives allow for a normative approach to standard principles of public law[348] that can result in a better understanding of the legitimacy of the judicial authority.[349]

Moving on to more practical implications, fiduciary laws can better specify cases where –or conditions upon which– delegation of public power can be allowed. In the fiduciary context, delegating discretion is, in principle, prohibited;[350] and, in the public (and judicial) context, delegating discretion, eg, to private actors can result in unchecked exercises of power.[351] The fiduciary conception can add a reminder that, where delegation is lawfully permitted and the judge is assisted in decision-making, it is still the fiduciary judge who must make the final judgment independently.[352]

Importantly, the fiduciary notion can transform theoretical demands into actual duties. The rule of law entails normative requirements, such as reasonableness, fairness or the presumption of trust. Fiduciary relationships are real and happening and fiduciary duties are actually imposed on those in authority.[353] Instead of having those in power determining the terms and conditions of relationships where consent is absent, legal duties are imposed on them as the fairest way possible to regulate such relationships.[354] These duties, holding the powerful

---

[343] Evan Fox-Decent, *Sovereignty's Promise* (n 211) 237.

[344] Evan Fox-Decent, *Sovereignty's Promise* (n 211) 37.

[345] Ethan Leib, David Ponet and Michael Serota, 'Translating Fiduciary Principles into Public Law' (n 324) 92.

[346] Lorne Sossin, 'An Intimate Approach to Fairness, Impartiality and Reasonableness in Administrative Law' (n 332) 851.

[347] Evan Criddle, 'Liberty in Loyalty' (n 323) 1028.

[348] Paul Miller, 'The Fiduciary Relationship' (n 327) 87.

[349] Paul Finn, 'Public Trusts, Public Fiduciaries' (n 326) 350.

[350] Gerald Lanning, 'The Crown-Maori Relationship' (n 334) 459, 462.

[351] Jody Freeman, 'Private Parties, Public Functions and the New Administrative Law' (2000) 52(3) Administrative Law Review 813, 818 <https://heinonline.org/HOL/P?h=hein.journals/admin52&i=825> accessed 5 October 2019.

[352] Elizabeth Baringhaus, 'Trustee's Power to Delegate: A Comparative View' (1974) 50(2) Notre Dame Law Review 273, 277, 282 <https://scholarship.law.nd.edu/ndlr/vol50/iss2/5> accessed 5 October 2019.

[353] Evan Fox-Decent and Evan Criddle, 'The Fiduciary Constitution of Human Rights' (n 337) 314.

[354] Evan Fox-Decent and Evan Criddle, 'The Fiduciary Constitution of Human Rights' (n 337) 315.

accountable,[355] actually protect the vulnerable, who, in the judicial context and like a minor in the parent-child relation, can become subjected to and affected by authority exercised, even though she did not consent to such subjection.[356]

In addition to the above theoretical and practical implications for the rule of law and the notion of the judge, the fiduciary approach to the judge can be beneficial for the very fiduciary concept and its potential extension to certain public actors. It can result in a better understanding of the concept of the private fiduciary, as well as satisfy the need to use long-institutionalised authorities as the reference point to assess the underlying ideas of the public fiduciary.[357] The well-established authority of the judge can be the particular reference point to examine and highlight the convergence and intertwining of true willingness –usually involved in the idea of the private fiduciary– and obligingness –that is often the case with public actors.

More precisely, the fiduciary notion implies authentic desire to serve the interests of others. One choosing to become a physician may not be fully aware of fiduciary laws, albeit she knows that medical life and practice are accompanied by legal obligations. She is both willing and obliged to fulfil these legal duties to benefit patients. Namely, she is bound by the duty of loyalty precluding self-interested behaviour[358] or the no-profit rule prohibiting her from extracting profits from the physician-patient relationship.[359] Such fiduciary duties and rules, introducing obligingness into the private sphere, can be mandatory and non-waivable to address asymmetries and vulnerabilities[360] and to highlight that a fiduciary relationship can be a status not subject to contractual negotiations.[361] Thus, private fiduciaries willingly adopt the idea 'my acting for you' but are, simultaneously, obliged to adopt it.[362] Still, one chooses to become a physician because of her good and sound motives of benevolence;[363] no law requires her to become a physician.

---

[355] Lindsay Breach, '*Fiducia* in Public Law' (2017) 48(3) Victoria University of Wellington Law Review 413, 422 <https://heinonline.org/HOL/P?h=hein.journals/vuwlr48&i=417> accessed 5 October 2019.

[356] Gertrude Elizabeth Margaret Anscombe, 'On the Source of the Authority of the State' in Joseph Raz (ed), *Authority* (New York University Press 1990) 142, 148.

[357] Evan Criddle and Evan Fox-Decent, 'Keeping the Promise of Public Fiduciary Theory: A Reply to Leib and Galoob' (2016) 126 The Yale Law Journal Forum 192, 215 <https://www.yalelawjournal.org/pdf/CriddleFoxDecentFinalPDF_4umqajnf.pdf> accessed 5 October 2019.

[358] Evan Criddle, 'Protecting Human Rights During Emergencies: Delegation, Derogation, and Deference' in Mónika Ambrus and Ramses Wessel (eds), *Netherlands Yearbook of International Law 2014: Between Pragmatism and Predictability: Temporariness in International Law* (Asser Press 2015) 197, 207-208 <https://scholarship.law.wm.edu/facpubs/1840/> accessed 5 October 2019.

[359] Sung Hui Kim, 'Fiduciary Law and Corruption' in Evan Criddle, Paul Miller and Robert Sitkoff (eds), *The Oxford Handbook of Fiduciary Law* (n 321) 813, 820.

[360] Dennis Hynes, 'Freedom of Contract, Fiduciary Duties, and Partnerships: The Bargain Principle and the Law of Agency' (1997) 54(2) Washington and Lee Law Review 439, 450-452 <https://heinonline.org/HOL/P?h=hein.journals/waslee54&i=451> accessed 5 October 2019; Melanie Leslie, 'Trusting Trustees: Fiduciary Duties and the Limits of Default Rules' (2005) 94(1) Georgetown Law Journal 67, 111 <https://heinonline.org/HOL/P?h=hein.journals/glj94&i=79> accessed 5 October 2019.

[361] Tamar Frankel, 'Fiduciary Duties as Default Rules' (1995) 74(4) Oregon Law Review 1209, 1211, 1214, 1242-1243 <https://heinonline.org/HOL/P?h=hein.journals/orglr74&i=1219> accessed 5 October 2019; Dennis Hynes, 'Fiduciary Duties and RUPA: An Inquiry into Freedom of Contract' (1995) 58(2) Law and Contemporary Problems 29, 34, 37, 39 <https://scholarship.law.duke.edu/lcp/vol58/iss2/3/> accessed 5 October 2019. But see Allan Vestal, 'Advancing the Search for Compromise: A Response to Professor Hynes' (1995) 58(2) Law and Contemporary Problems 55 <https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=4273&context=lcp> accessed 5 October 2019.

[362] Charlie Webb, 'The Philosophy of Fiduciary Law' in Evan Criddle, Paul Miller and Robert Sitkoff (eds), *The Oxford Handbook of Fiduciary Law* (n 321) 687, 693-694, 697, 701.

[363] For the role of motives in the fiduciary relationship, see: Charlie Webb, 'The Philosophy of Fiduciary Law' (n 362) 703; Paul Miller and Andrew Gold, 'Fiduciary Governance' (n 233) 557.

The same is true for the parent or the judge. No one is obliged by law to become a judge. One becomes a judge, because she wishes to serve the people, the law and other-regarding purposes. She knows and willingly accepts that, once she becomes a judge, she will be bound by duties of public nature and subjected to mandatory mechanisms of checks and balances. This voluntary undertaking to serve the public good comes with something stricter than legal duties imposed on physicians or parents. Such undertaking can reveal with great clarity how one, motivated to do good, can voluntarily enter a relationship, where meeting loyalty-like requirements is mandatory. These considerations allow for a better understanding of voluntariness in the fiduciary context. And the judge, reflecting the triumph of impartiality and required by law to reach the impossible and become freed from bias, can best demonstrate how the fiduciary's genuine desire to disinterestedly serve others can still exist as authentic willingness intertwined with, but not manipulated by, mandatory mechanisms.

The fiduciary conception of the judge can go beyond discussions on theoretical and practical implications for both the judge and the fiduciary notions. It can be a necessity triggered by data driven decision-making, sentencing courts delegate to private technologies, to make such decision-making serve the best interests of the people. To develop this argument, the concept of the data controller is briefly analysed.

§IV.5. To Infringe or to Comply with the Law?

Data driven models can be trained on personal data to make decisions judges delegate to them. Such training, involving processing of personal data, can trigger obligations imposed on the (private) 'data controller';[364] that is, a concept introduced to guarantee accountability.[365] Determining the purposes and means of the processing, controllers must comply with general principles of data processing.[366] Under the European regime, these principles are: 'lawfulness, fairness and transparency', 'purpose limitation', 'data minimisation', 'accuracy', 'storage limitation', 'integrity and confidentiality' and 'accountability'.[367] Several duties are imposed to safeguard these principles; albeit, unwanted risks of Big Data, from opacity and unintelligibility to the tendency to collect the biggest possible data, may challenge the principles, with which controllers must comply.

Namely, to adhere to the principle of fairness and transparency, controllers must provide intelligible information about the data driven rationale.[368] However, complex data driven procedures may not be susceptible to comprehensive explications, where the very controllers can neither know nor understand how their models make decisions.[369] The principles of fairness and transparency can be further challenged, where huge amounts of data are collected in the

---

[364] The Law Society Commission on the Use of Algorithms in the Justice System, *Algorithms in the Criminal Justice System* (The Law Society of England and Wales 2019) 25 <https://www.lawsociety.org.uk/support-services/research-trends/algorithm-use-in-the-criminal-justice-system-report/> accessed 5 October 2019. To some, the very model might be considered as personal data; Michael Veale, Reuben Binns and Lilian Edwards, 'Algorithms that Remember: Model Inversion Attacks and Data Protection Law' (2018) 376(2133) Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences 1 <http://doi.org/10.1098/rsta.2018.0083> accessed 5 October 2019.
[365] Simone Fischer-Hübner and others, 'Online Privacy – Towards Informational Self-Determination on the Internet' (n 21) 134.
[366] General Data Protection Regulation, arts 4(7), 5.
[367] General Data Protection Regulation, art 5.
[368] General Data Protection Regulation, arts 13(2)(f), 14(2)(g).
[369] Ugo Pagallo, 'Algo-Rhythms and the Beat of the Legal Drum' (2018) 31(4) Philosophy & Technology 507, 515ff <https://doi.org/10.1007/s13347-017-0277-z> accessed 5 October 2019.

absence of people's awareness.[370] Furthermore, data controllers are required to implement technical mechanisms to comply by-design with the processing principles.[371] Yet how the overall structure of processing could adhere to such principles is not always clear. For instance, failure to specify the processing purposes could jeopardise the principle of purpose limitation;[372] and, where processing is repurposed, uncertainties may occur as to which data must be erased to comply with the principle of accuracy –in relation to the processing purposes.[373]

Even though legal requirements can be disrupted by unwanted consequences of the use of Big Data, such as opacity or unintelligibility, the processing principles can also be intentionally jeopardised. This can be the case, because compliance with data processing-related laws is left to the discretion of controllers. Literature suggests that data processing is profitable.[374] Instead of investing in implementing mechanisms to comply with the law, controllers may choose to process all data for ever-changing purposes without the consent of the data subjects.[375] After having made profits of billions, they may be held liable for infringement and might be ordered to pay compensation[376] or, perhaps, face criminal charges.[377] In the context of criminal justice, the dilemma of abiding by or breaching legal provisions can mean that for-profit controllers, not subject to public restrictions, may build models that guarantee efficiency, secure bigger profits, but prejudice fairness; thus, data driven technologies informing sentencing decisions can be biased against minorities or fail to give rational justifications for their decision-making.

The above dilemma controllers face (efficiency versus fairness or breach of law versus compliance with law) and their response to this dilemma are crucially important in the judicial context, where voluntary adherence to law cannot suffice to prevent abuses of public power due to absence of rational reasons. Obligingness of public law is necessary to guarantee fair and reasonable decision-making that serves the people's best interests. To the extent that data driven decision-making constitutes exercise of public authority, it must meet the demands of reasonableness and fairness.[378] As already argued, the judge, who orders a decision based on data driven risk assessment, exercises public authority, which necessarily involves that assessment. Were there no data driven model, the judge would have to evaluate the accused and justify that evaluation as part of the process and the court's reasoning. Now that the judge delegates this same task to private technologies, same safeguards must be provided, for same authority is exercised, same fundamental rights are affected and same vulnerability occurs on the part of the alleged infringer –and the society as a whole.

---

[370] European Union Agency for Fundamental Rights and Council of Europe, *Handbook on European Data Protection Law* (n 33) 118-122.

[371] General Data Protection Regulation, arts 24, 25, 32.

[372] Sandra Wachter, 'The GDPR and the Internet of Things: A Three-Step Transparency Model' (2018) 10(2) Law, Innovation and Technology 266, 272-273 <https://doi.org/10.1080/17579961.2018.1527479> accessed 5 October 2019.

[373] General Data Protection Regulation, art 5(1)(d).

[374] Gianclaudio Malgieri and Bart Custers, 'Pricing Privacy – The Right to Know the Value of Your Personal Data' (2018) 34(2) Computer Law & Security Review 289 <https://doi.org/10.1016/j.clsr.2017.08.006> accessed 5 October 2019.

[375] George Hurlburt and Jeffrey Voas, 'Big Data, Networked Worlds' (2014) 47(4) Computer 84 <https://ieeexplore.ieee.org/document/6798583> accessed 5 October 2019.

[376] General Data Protection Regulation, art 82.

[377] General Data Protection Regulation, recital 149.

[378] Evan Fox-Decent, *Sovereignty's Promise* (n 211) 25 (mentioning that 'exercises of public power that fail to respect the demands of fairness and reasonableness are unlawful').

Data driven decision-making in the judicial context calls for the 'fiduciarisation' of the judge. As the next sections argue, theoretical perspectives can bring rationales to underlie the use of data driven technologies in sentencing that has, since the nineteen-seventies, relied mainly upon the need for consistency in decisions –or the idea of pre-emption. Fiduciary requirements, reminding judges that they must make the final decision independently, can avoid having data driven models transforming discretionary judges into executant actors. Furthermore, the fiduciary concept, making theoretical demands of the rule of law tangible reality, can render judges fully-fledged and armed with all necessary skills, when dealing with such models. As it will be argued, all the above in conjunction with the intertwining of mandatory measures (inspired by obligingness of public law) and authentic willingness (derived from autonomy aspects of private law) can make data driven decisions serve the people's best interests.

§IV.6. A Review of Reasonableness and Fairness

The judge can be bound by a fiduciary duty to subject data driven decision-making to a mandatory review of reasonableness and fairness.[379] The theoretical demands of reasonableness and fairness, derived from the rule of law (and the authority notion), can be transformed into actual duties via the one-to-many aspects of the fiduciary duty of loyalty. The mandatory nature of the review, inspired by obligingness of public law, complies with the binding nature or no-waiver rule of certain fiduciary duties –and, as it will be argued, it does not manipulate authentic willingness, also apparent in the fiduciary concept.

The proposed review consists of three reasonableness tests: examination of objections against data driven decision-making (objection-test); checks for rational links between input and output (rationality-test); and due consideration of alternatives (alternatives-test). It is suggested to be mandatory to ensure that solely models passing tests are used to inform sentencing decisions. The mandatory nature can also allow for a dynamic competition among data controllers, who target their models at the criminal justice system –and who would choose the appropriate means of processing to pass tests.[380] However, and despite any implications for controllers, the review is directed to the judge, not the data controller.[381] It is for the judge to assess reasonableness and fairness of data driven decision-making and either accept or reject the use of the technology –meaning, either approve or deny the application of the outcome of the data driven decision-making to the case at hand.

As this section stresses, to pass review, the model must meet demands of procedural fairness, of flexible processes that can guarantee decisions serve the people's best interests.[382]

---

[379] For checks aimed at offering comprehensive reasons, see: Etienne Mureinik, 'Reconsidering Review: Participation and Accountability' (1993) 1993 Acta Juridica 35, 40 <https://heinonline.org/HOL/P?h=hein.journals/actj1993&i=41> accessed 5 October 2019; Kevin Vallier, 'In Defence of Intelligible Reasons in Public Justification' (2016) 66(264) The Philosophical Quarterly 596 <https://doi.org/10.1093/pq/pqv117> accessed 5 October 2019.

[380] Etienne Mureinik, 'Reconsidering Review' (n 379) 42 (suggesting that 'a decision-maker which knows that its decisions are likely to be reviewed (…) will invest effort (…) to pass review').

[381] As mentioned in the introductory chapter (section §I.2.), the judge deals with data processing, whose purposes and means have already been and are still being chosen by a private actor. The suggested review addresses the judge as a potential public fiduciary, not as a potential data controller.

[382] Bruce Dyer, 'Determining the Content of Procedural Fairness' (1993) 19(1) Monash University Law Review 165, 178ff, 199ff <https://heinonline.org/HOL/P?h=hein.journals/monash19&i=171> accessed 5 October 2019; Thomas Poole, 'Procedural Fairness in Dismissals: Towards a 'Due Process' Approach?' (1998) 27(3) Industrial Law Journal 233, 234 <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=80104947&site=ehost-live> accessed 5 October 2019; Michael Tsele, 'Coercing Virtue in the Constitutional Court: Neutral Principles,

As argued in chapter III, processes can be perceived as fair, where people are given voice, impartiality is guaranteed and dignity is respected in the sense that facts of each particular case are fully considered.[383] In what follows, the objection-, rationality- and alternatives-tests are analytically discussed and matched to the procedural fairness demands of voice-giving, impartiality and due consideration of individual cases.

As chapter III stressed, the judge is required to justify decisions and respect the right to a fair hearing entailing transparency and public scrutiny of the decision-making. The fiduciary conceptualisation of the judge can (via the objection-test) transform these theoretical requirements into a real duty to give people voice and make data driven decision-making open and contestable. More precisely, the fiduciary judge can be required to examine whether data driven decision-making fully considers all crucial objections, as well as whether the denial of these objections can be reasonably justified (objection-test).[384] Namely, a model may have been trained on data that represent only situations where women sexually assaulted wore skirt. This could establish a connection between clothing and sexual assault. The model could then find all rapists innocent on the grounds of the myth that 'women deserve to be raped if they are not conservatively dressed'.[385] In such a case, a number of serious objections could be raised and it seems that their rejection could not be reasonably justified.

Voice-giving can address the objection-test. The fiduciary judge can be required to use only those technologies, whose inputs and outputs are made publicly available, eg, on open platforms, like the controllers' websites. This requirement can create a public record that will, in turn, render data driven decisions contestable. For instance, the model may consider a defendant as being at high risk of reoffending on the basis of historical criminal data about jurisdiction X, the defendant's gender, his socioeconomic status, his previous arrests and his responses to a questionnaire designed for the risk assessment. These grounds can be made publicly available, as can be the case with evidence brought before court. Knowing the input, the defendant will be given the chance to challenge the data driven decision, as evidence before court, on the grounds that, eg, inclusion of information over which he has no control, like previous arrests or gender, is discriminative. He will also be given the opportunity to contest the decision's validity on the basis that unquantifiable (eg, socioeconomic) factors are too vague a criterion to be considered.

Here, it could be argued that demanding defendants to actively challenge decisions may run counter to the fiduciary notion that would aim to exempt people from any obligation to check the decision-making and from 'looking over the fiduciary's shoulder'.[386] Yet it must be borne in mind that it is the judge who is demanded to use solely open technologies and render decision-making contestable. People are given the genuine chance and opportunity –a right, not

---

Rationality and the Nkandla Problem' (2016) 8 Constitutional Court Review 193, 218 <https://heinonline.org/HOL/P?h=hein.journals/conrev8&i=203> accessed 5 October 2019.

[383] Tom Tyler, 'Procedural Justice and the Courts' (n 206) 30.

[384] For justification tests, see: Etienne Mureinik, 'A Bridge to Where? Introducing the Interim Bill of Rights' (1994) 10(1) South African Journal on Human Rights 31, 41 <https://heinonline.org/HOL/P?h=hein.journals/soafjhr10&i=39> accessed 5 October 2019; Federico Fabbrini, 'Reasonableness as a Test for Judicial Review of Legislation in the Jurisprudence of the French Constitutional Council' (2009) 4(1) Journal of Comparative Law 39, 43 <https://pure.uvt.nl/ws/portalfiles/portal/1458799/Fabbrini_JCL_Reasonableness_as_a_test_for_judicial_review _in_France.pdf> accessed 5 October 2019.

[385] Claire L'Heureux-Dubé, 'Beyond the Myths: Equality, Impartiality, and Justice' (2001) 10(1) Journal of Social Distress and the Homeless 87, 90 <https://doi.org/10.1023/A:1009433703175> accessed 5 October 2019.

[386] Ethan Leib, 'Friends as Fiduciaries' (2009) 86(3) Washington University Law Review 665, 692 <https://heinonline.org/HOL/P?h=hein.journals/walq86&i=671> accessed 5 October 2019.

a duty– to contest decisions on the grounds of known inputs or risk criteria. This complies with both the (beneficiaries') right to access information and the fiduciary duty of loyalty entailing full transparency.[387] Besides, the capacity to oppose a decision, in conjunction with actual oppositions, can enable the fiduciary judge to act ex officio and/or on request and dutifully examine both potential and actual objections.

Furthermore, disclosure of the output, the risk assessment's result for each case, can be equally important. Information about both input and output, taken together with further details about cases, such as the grounds of actual objections, can create a particularly useful record. After having decided on a number of cases, the model can, necessarily due to that record, become open to public scrutiny. For instance, a model's long history of objections of the same nature, like its failure to accurately represent population of jurisdiction X, could mean that the model is unreliable by reason of its input. In such a case, were input data not updated to meet representativeness, all crucial objections would not have been taken into due account and the model would most probably fail the objection-test.

Moreover, as discussed in chapter III, the judge, required by law to be impartial, can address her own biases by engaging in dialogue and audit. The 'fiduciarised' judge can (via the rationality-test) be bound by an actual duty to seek for expert assistance and detect identifiable bias in data driven decision-making. More precisely, the judge can be demanded to examine whether such decision-making establishes optimally rational links between input and output (rationality-test).[388] For instance, in the example of women wearing skirt and being sexually assaulted, it would be hard to establish a rational link between clothing, suggesting 'deservedness' (with regard to being raped), and innocence (on part of the rapist). In similar cases, the model may be trained on inaccurate data representing situations where only coloured people would have been involved in crimes. This could establish a connection between dangerousness and race. If the model recommended high likelihood of future offence on the basis of the myth that blacks are 'mad (…) bad and dangerous',[389] the rational link between input and output would most probably not be established.

To create optimally rational links, impartiality standards must be met. Namely, in the example of the model using gender, socioeconomic status and arrest record as risk criteria to evaluate the accused, a rational link must be established between these factors and the scoring result. The fiduciary judge can be demanded to seek for expert assistance and consult with various professionals to determine whether factors, like gender, should be allowed (and whether they have rightly been included by the controller) as accuracy-enhancing or whether they should be rejected (and whether they have rightly been excluded by the controller) as accuracy-diminishing. She can be required to engage in dialogue to let diversity of opinions 'enlarge her mind' and make her aware of partiality involved in data driven decision-making.[390] The judge

---

[387] Amir Licht, 'Lord Eldon Redux: Information Asymmetry, Accountability and Fiduciary Loyalty' (2017) 37(4) Oxford Journal of Legal Studies 770, 793-794 <https://doi.org/10.1093/ojls/gqx003> accessed 5 October 2019.

[388] For rationality tests, see: Thomas Nachbar, 'The Rationality of Rational Basis Review' (2016) 102(7) Virginia Law Review 1627, 1650 <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=119438154&site=ehost-live> accessed 5 October 2019.

[389] Frank Keating and David Robertson, 'Fear, Black People and Mental Illness: A Vicious Circle?' (2004) 12(5) Health and Social Care in the Community 439, 445 <https://doi.org/10.1111/j.1365-2524.2004.00506.x> accessed 5 October 2019.

[390] For the 'enlargement of mind' and how it can address bias, see: Hannah Arendt, *Lectures on Kant's Political Philosophy* (The University of Chicago Press 1982) 42ff; Jennifer Nedelsky, 'Embodied Diversity and the Challenges to Law' (1997) 42 McGill Law Journal 91, 107, 113 <http://www.lawjournal.mcgill.ca/userfiles/other/5576315-42.Nedelsky.pdf> accessed 5 October 2019.

can be further demanded to subject the model to regular audit, overview and scrutiny by expert technicians to detect risk of potentially identifiable bias.[391] This is a promising way to establish optimally rational links, a prerequisite to pass the rationality-test.

Finally, as analysed in chapter III, the judge must perform a reasoned quest for fairness and prove compliance with the law –or explain how a peculiar case makes case law inapplicable. This requirement can (via the alternatives-test) be transformed into an actual duty to opt for individual treatment of cases, a challenging task in the data driven context. Here, the judge can be required to assess whether data driven decision-making takes into due account all options available (alternatives-test). Thereafter, she can be demanded to use solely optimal technologies that are designed exclusively for or best fit sentencing-related purposes.

In the example of sexually assaulted women, the biased dataset may have been chosen for marketing-related reasons. That is, the same model could have been brought on market and targeted at providers of private security services. Such services could, in turn, be tailored to conservative parents, who would seek for proof that their young daughters' provocative clothing raises the risk of them being assaulted. In this case, an alternative to the use of the biased input could be either the choice of another model (eg, particularly designed for informing sentencing decisions) or the choice of the former model, if it were adjusted to sentencing-related purposes (eg, if the data controller, wishing to have her model used in court, limited by its own deliberate action the scope of the processing purposes to the evaluation of the accused and, thus, chose appropriate inputs). In both scenarios, if the choice to use the peculiar input were deemed necessary and the least harmful way to reach the objective of aiding sentencing decisions and if no less biased inputs were available and capable of being used without undue burden, the alternatives-test could be passed.

To best fit sentencing-related purposes, the model must take into full consideration one's particular case. This is a great challenge, since the very input consists of group data, such as information about jurisdiction X. The model would score the defendant as high-risk, after having classified him as part of a group labelled as high-risk. From this perspective, treating a person as an individual, rather than a classified entity, may be a complex task. Yet the judge faces such challenges when applying (case) law to the facts of a case; it is training that enhances her skills in identifying the peculiar facts.[392] In the same vein, the judge can improve her skills in finding what the individual facts, already identified, mean in the data driven context. Experts, from ethicists to psychologists, can assist her in, eg, tailoring the questionnaire, designed for the risk assessment, to a particular case.[393] After examining inputs best fit for each case, it could be proved that all options available were taken into due account and that the most appropriate and promising inputs were finally chosen. This way, the alternatives-test could be passed.

---

[391] For tests to identify bias, see: Saima Hanif, 'The Use of the Bystander Test for Apparent Bias' (2005) 10 Judicial Review 78 <https://heinonline.org/HOL/P?h=hein.journals/judire10&i=78> accessed 5 October 2019; for factors that may manipulate judgments, see: Christopher Hsee, 'Elastic Justification: How Unjustifiable Factors Influence Judgments' (1996) 66(1) Organizational Behavior and Human Decision Processes 122 <https://doi.org/10.1006/obhd.1996.0043> accessed 5 October 2019; for intentional subjection of systems to external monitoring, see: Eric Ip, 'The Judicial Review of Legislation in the United Kingdom: A Public Choice Analysis' (2014) 37(2) European Journal of Law and Economics 221, 243 <https://doi.org/10.1007/s10657-011-9281-4> accessed 5 October 2019.

[392] Frank Emmert, '*Stare Decisis*' (n 177) 209.

[393] It is assumed that the questionnaire does not involve personal data and that, if it involves personal data, it does not constitute means of processing. In the absence of such assumptions, 'tailoring the questionnaire' could make the judge define the means of processing and render her a data controller.

To sum up, the objection-test and the procedural requirement of voice-giving can make the fiduciary judge bound by a duty to use solely technologies allowing for full disclosure and to assess potential and actual objections to data driven decision-making, as well as justifiability of the rejection of such objections. The rationality-test, in conjunction with impartiality standards, can impose on the fiduciary judge a duty to create optimally rational links between inputs and outputs via dialogue, audit and scrutiny that can result in detecting identifiable biases. Finally, the alternatives-test can demand the fiduciary judge to assess whether data driven decision-making fully considers all options available, but also to use solely technologies designed exclusively or best fit for sentencing-related purposes –and, eg, to exclude models pursuing objectives irrelevant to judiciary aspects of data processing. This latter test, taken together with the due consideration of individual cases, can further create a fiduciary duty to seek for expert assistance and tailor data driven performance to individual facts, already identified.

As the examples of each test suggest, the data driven model would fail the objection-test, if, eg, it did not update input data to meet representativeness of population of jurisdiction X; it would fail the rationality-test, if, eg, it used risk factors deemed discriminatory or accuracy-diminishing; and it would fail the alternatives-test, if, eg, its design, performance or input were targeted at goals irrelevant to the evaluation of the accused. Each of these failures can trigger a fiduciary duty to deny the use of the technology –that is, the application of the outcome of the data driven decision-making to the case at hand. To justify both approvals and denials of uses, the fiduciary judge must become 'fully-fledged' and skilled; that is, well aware of how data driven models operate, their capabilities and limitations. This way, the 'fiduciarised' judge can fairly and rightly enjoy discretion in making independent and not inappropriately influenced judgments. Despite delegation, she can always be the final decisionmaker and escape the risk of becoming an executant adjudicator, who mechanically enforces data driven recommendations.

§IV.7. Conclusion

Fides, the goddess of good faith, expected the auctoritas to fulfil their duties of reasonableness and fairness when exercising public power. The fulfilment of the same duties is expected today, not by the gods but by the people. The 'fiduciarisation' of the judge can transform reasonableness and fairness, the 'sine qua non' conditions for any exercise of public authority to be lawful,[394] from theoretical constructions into actual duties regulating data driven decision-making. Justifying judicial reasoning and respecting the right to a fair hearing can be translated into open inputs and outputs and contestable data driven decisions; the requirement of bias rationalisation can become a duty to establish rational links between inputs and outputs, engage in dialogue and search for expert audit and scrutiny; and the reasoned quest for justice can be transformed into due consideration of individual cases. These transformations can render the (rule of law's mythical hero, ie the) absolutely independent and impartial judge a fully-fledged and skilled fiduciary; the final and optimally accurate decisionmaker.

Such transformations can bring rationales or, more accurately, the rationale to underlie data driven decision-making informing sentencing decisions; the rationale of serving the best interests of the people. As evidence upon which the judge bases her final judgment, data driven decisions can become contestable; as part of the judicial process, they can become open, optimally due and fair; and, as part of the judge's reasoning, they can become justifiable. Same as humanmade, data driven decisions can be justified by scrutinising inputs and outputs. So

---

[394] Evan Fox-Decent, *Sovereignty's Promise* (n 211) 25, 36-37.

long as judicial decisions are explicable after perusing evidence and final ordering and insofar as the judge is not expected to reveal what happens inside her mind, imposing actual fiduciary duties to examine inputs and outputs, rather than the very processing, can be the ideal way to guarantee reasonableness and fairness. The successful fulfilment of these duties can ensure the most promising inputs. Such inputs can, in turn, lead to the most promising outputs. This way, decisions sentencing courts delegate to private data driven technologies can serve the best interests of the people.

Lastly, the mandatory nature of the proposed review is also for the benefit of the people. No law demands an individual to know the modus operandi of data driven models; and no legal duty requires a person to distinguish between correlations and causations or to rationally link one's shoe size to the likelihood of her engaging in future offence. Yet the one wishing to become a judge and serve society and the law is willing to make people truly aware of and meaningfully informed about the decision-making involved. Prior to becoming a judge, that person may be aware of neither fiduciary laws nor data driven technologies; albeit, she knows that judicial practice comes with legal obligations she is willing and will be obliged to undertake. Her genuine desire to serve the people's interests and, eg, render the ignorant well-informed is in no way prejudiced by the mandatory nature of the suggested review. Rather, her true willingness (demonstrating benevolent motives required by the duty of loyalty) demands obligingness (required by binding fiduciary duties) to address the peculiar vulnerabilities involved in the judge-people relation.

The intertwining of one's free desire and the binding effect is necessary to place the judge-people relationship well above contracts. It is imperative to highlight this relationship as a status offering the final decisionmaker the opportunity, as well as imposing on her the duty, to let people know what data driven decision-making is really all about. This intertwining can serve the best interests of the people. This is particularly true where neither the public nor the defendant know that data driven decision-making informs sentencing decisions.[395] Obliged (and willing) to review reasonableness and fairness, the 'fiduciarised' judge will leave no 'citizen of the world' unaware of the involvement of data driven technologies in sentencing, as well as of their capabilities and limitations.

---

[395] Gwen van Eijk, 'Socioeconomic Marginality in Sentencing' (n 105) 466.

V. CONCLUSION

§V.1. Summary of the Research

In its introductory chapter, the thesis stressed that, despite safeguards provided for by existing legal regimes, mandatory mechanisms of checks and balances, similar to those of public nature, are inapplicable to private technologies used in sentencing courts. In the absence of adequate guarantees that the data driven decisions in question serve the people's best interests, the thesis posed the key research question of 'how could a system of checks and balances be introduced to ensure that decisions sentencing courts delegate to private data driven technologies serve the best interests of the people?' –meaning to ensure that data driven decisions on the evaluation of the accused are justifiable, open to public scrutiny and delivered via due and fair processes.

Chapter II found that such decisions can seriously affect the people and their important interests. Namely, both alleged offenders and the public may be ignorant of the use of data driven technologies in sentencing; and defendants may be denied the opportunity to contest data driven evidence, whose accuracy neither the court nor the private controller may verify. The analysis made in chapter III suggested that such data driven decision-making can qualify as exercise of judicial authority. This qualification requires that someone be bound by the duty of reasonableness and fairness; that is, a duty imposed on any public authority as well as any fiduciary involved in one-to-many relations.

Addressing the initial problem and key research question, chapter IV proposed the 'fiduciarisation' of the judge and, in particular, a mandatory review of reasonableness and fairness as a system of checks and balances to guarantee decisions sentencing courts delegate to private data driven models serve the best interests of the people. The review, drawing inspiration from the demands the judge must satisfy as a public authority bound by the rule of law, consists of three reasonableness tests that can be best addressed through adherence to procedural fairness. As analysed in chapter IV, the fiduciary conceptualisation of the judge can to a great extent transform opaque and unintelligible data driven decision-making into contestable evidence, open and optimally due and fair process and justifiable judicial reasoning.

If the best interests of the people, ie those potentially subjected to and affected by the authority of the judge, are understood (as the thesis suggested) in an optimal sense as the interests served by the judge whose decision-making is justifiable, open to public scrutiny and delivered through optimally due and fair processes, then this transformation can make data driven decision-making at the service of the people's best interests. Therefore, as the thesis demonstrated, it can be via the 'fiduciarisation' of the judge that a mandatory review of reasonableness and fairness could be introduced as a system of checks and balances to ensure that decisions sentencing courts delegate to private data driven technologies serve the best interests of the people.

§V.2. Limitations and Discussion

Contrary to so far literature addressing data controllers as private fiduciaries, this research focused on the judge (rather than the controller) and public fiduciaries (rather than private). This approach has, at least, two limitations. First, fiduciaries and their compliance with their duties are typically checked by courts. Were judges seen as fiduciaries, the question of 'who would review the judge?' would be raised. However, there seems to be nothing illegal, abnormal or worrisome in having judges reviewed, checked or judged by other judges. Besides, this can be and is the case in other situations. For instance, a judge failing to meet impartiality and deciding on cases to fulfil her own interests can be subjected to review by other judges. Second, the data controller-approach to data driven decision-making was not given due

consideration. However, and even though the thesis intentionally limited its scope to the perspective of the judge, the proposed review could have some positive implications for private data controllers.

Responsibly bringing private technologies into sentencing courts, the mandatory review could introduce a culture of reason-giving. It could take place not only regularly and during the real evaluation of the accused, but also before it. Most of the review's considerations are related to inputs and outputs, which would be absent, if no previous data driven decision-making were made. Therefore, there could be a pre-review, a trial stage to test the model before the judge deals with its decision-making in a real case. Such a pre-review could take place in the context of moot court competitions, where many competing models would be tested and the optimal would be chosen. This could incentivise controllers with a genuine desire to have their models used in sentencing courts; they would make their best efforts to be the one who would pass the pre-review at the trial stage.

Such best efforts could accompany the process suggested by the 'fiduciarisation' of the judge. Namely, controllers could perform their role as private epistemic authorities. As discussed in chapter III, the health professional, testifying before court, justifies her reasoning to prove her skills; and she is trusted on the basis of her good reputation. In the same vein, controllers could seek for ways to explain their models' decisions by referring to, eg, the expertise of their designers. They could implement ranking mechanisms and enable expert third parties to evaluate their models and measure their performance. Such best efforts, initiated by the very controllers and revealing authentic willingness to give reasons, could be taken into consideration at the trial stage. Since many controllers would compete for a single post, the reason-giving rationale could become the norm for both the controller passing the trial stage and those failing it.

This way, the proposed review could be a step towards making decisions sentencing courts delegate to private data driven technologies optimally reasonable and fair and at the service of the people's best interests, as well as towards bringing a culture of justifications and reason-giving that could engulf both public and private arenas.

BIBLIOGRAPHY

Books

Andrews DA and Bonta J, *The Psychology of Criminal Conduct* (5th edn, Matthew Bender and Company 2010)

Arendt H, *Lectures on Kant's Political Philosophy* (The University of Chicago Press 1982)

Baker P, *Data Divination: Big Data Strategies* (Cengage Learning PTR 2014)

Bogle J, *Don't Count on It!: Reflections on Investment Illusions, Capitalism, "Mutual" Funds, Indexing, Entrepreneurship, Idealism, and Heroes* (John Wiley & Sons 2011)

Čapek K, *Tales from Two Pockets* (Catbird Press 1994)

Carter JB, *The Religion of Numa: And Other Essays on the Religion of Ancient Rome* (MacMillan 1906)

Chopra S and White L, *A Legal Theory for Autonomous Artificial Agents* (University of Michigan Press 2011)

Clark A, *Natural-Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence* (Oxford University Press 2003)

Criddle E and Fox-Decent E, *Fiduciaries of Humanity: How International Law Constitutes Authority* (Oxford University Press 2016) <http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199397921.001.0001/acprof-9780199397921> accessed 5 October 2019

European Union Agency for Fundamental Rights and Council of Europe, *Handbook on European Data Protection Law* (2018 edn, European Union Agency for Fundamental Rights and Council of Europe 2018)

Finnis J, *Natural Law and Natural Rights* (2nd edn, Oxford University Press 2011)

Fletcher G, *Loyalty: An Essay on the Morality of Relationships* (Oxford University Press 1993)

Fox-Decent E, *Sovereignty's Promise: The State as Fiduciary* (Oxford University Press 2011)

Frankel T, *Trust and Honesty: America's Business Culture at a Crossroad* (Oxford University Press 2006)

Galinsky K, *Augustan Culture: An Interpretive Introduction* (Princeton University Press 1996)

Galligan D, *Due Process and Fair Procedures: A Study of Administrative Procedures* (Oxford University Press 1997) <http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780198256762.001.0001/acprof-9780198256762> accessed 5 October 2019

Golash D, *The Case Against Punishment: Retribution, Crime Prevention, and the Law* (New York University Press 2005)

Hamelink C, *The Ethics of Cyberspace* (SAGE Publications 2000)

Hernández G, *The International Court of Justice and the Judicial Function* (Oxford University Press 2014) <https://doi.org/10.1093/acprof:oso/9780199646630.001.0001> accessed 5 October 2019

Hilton Z, Harris G and Rice M, *Risk Assessment for Domestically Violent Men: Tools for Criminal Justice, Offender Intervention, and Victim Services* (American Psychological Association 2010)

Hood P, *Principles of Lender Liability* (Oxford University Press 2012)

Lewis B, *The Law of Trusts* (eLangdell Press 2013) <https://www.cali.org/sites/default/files/Trusts_Lewis_Dec2014.pdf> accessed 5 October 2019

Luhmann N, *Trust and Power* (Wiley 1979)

Morgan T, *Roman Faith and Christian Faith: Pistis and Fides in the Early Roman Empire and Early Churches* (Oxford University Press 2015)

Mshelia A, *Cognition, Culture and Field Dependence – Independence* (AuthorHouse 2008)

O'Neil C, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (Crown Publishing Group 2016)

Office of the High Commissioner for Human Rights, *Human Rights in the Administration of Justice: A Manual on Human Rights for Judges, Prosecutors and Lawyers* (United Nations 2003)

Pasquale F, *Black Box Society: The Secret Algorithms That Control Money and Information* (Harvard University Press 2016)

Rasskin-Gutman D, *Chess Metaphors: Artificial Intelligence and the Human Mind* (MIT Press 2009)

Raz J, *The Authority of Law: Essays on Law and Morality* (Clarendon Press 1979)

Richterich A, *The Big Data Agenda: Data Ethics and Critical Data Studies* (University of Westminster Press 2018) <https://www.jstor.org/stable/j.ctv5vddsw.3> accessed 5 October 2019

Rotman L, *Fiduciary Law* (Thomson Carswell 2005)

Royce J, *The Philosophy of Loyalty* (MacMillan 1908)

Russell S and Norvig P, *Artificial Intelligence: A Modern Approach* (2nd edn, Pearson Education 2003)

Settem OJ, *Applications of the 'Fair Hearing' Norm in ECHR Article 6(1) to Civil Proceedings: With Special Emphasis on the Balance between Procedural Safeguards and Efficiency* (Springer 2016)

Siegel E, *Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die* (2nd edn, John Wiley & Sons 2016)

Solove D, *The Future of Reputation: Gossip, Rumor, and Privacy on the Internet* (Yale University Press 2007)

Stiegler B, *Technics and Time, 1: The fault of Prometheus* (Stanford University Press 1998)

Szpiech R, *Conversion and Narrative: Reading and Religious Authority in Medieval Polemic* (University of Pennsylvania Press 2013)

Tamanaha B, *On the Rule of Law: History, Politics, Theory* (Cambridge University Press 2004)

Torey Z, *The Conscious Mind* (MIT Press 2014) <http://cognet.mit.edu/book/conscious-mind> accessed 5 October 2019

Uslaner E, *The Moral Foundations of Trust* (Cambridge University Press 2002)

Weber M, *The Theory of Social and Economic Organization* (The Free Press 1964)

— — *Economy and Society: An Outline of Interpretive Sociology* (University of California Press 2013)

Weinrib J, *Dimensions of Dignity: The Theory and Practice of Modern Constitutional Law* (Cambridge University Press 2016)

Journal Articles

Aagaard L, 'Fiduciary Duty and Members of Parliament' (2008) 31(2) Canadian Parliamentary Review 31 <http://www.revparl.ca/31/2/31n2_08e_Aagaard.pdf> accessed 5 October 2019

Airaksinen T, 'Coercion, Deterrence, and Authority' (1984) 17(2) Theory and Decision 105 <https://doi.org/10.1007/BF00160977> accessed 5 October 2019

Alexander G, 'Institutionalized Uncertainty, the Rule of Law, and the Sources of Democratic Stability' (2002) 35(10) Comparative Political Studies 1145 <https://doi.org/10.1177/001041402237946> accessed 5 October 2019

Allan TRS, 'Procedural Fairness and the Duty of Respect' (1998) 18(3) Oxford Journal of Legal Studies 497 <https://heinonline.org/HOL/P?h=hein.journals/oxfjls18&i=507> accessed 5 October 2019

Allars M, 'Citizenship Theory and the Public Confidence Rationale for the Bias Rule Reshaping the Judiciary' (2000) 18(1) Law in Context 12 <https://heinonline.org/HOL/P?h=hein.journals/lwincntx18&i=18> accessed 5 October 2019

Anderson C, 'Epistemic Authority and Conscientious Belief' (2014) 6(4) European Journal for Philosophy of Religion 91 <https://philarchive.org/archive/ANDEAA-3> accessed 5 October 2019

Andrejevic M, 'The Big Data Divide' (2014) 8 International Journal of Communication 1673 <https://ijoc.org/index.php/ijoc/article/view/2161/1163> accessed 5 October 2019

Andrews DA, Bonta J and Wormith S, 'The Recent Past and Near Future of Risk and/or Need Assessment' (2006) 52(1) Crime & Delinquency 7 <https://doi.org/10.1177/0011128705281756> accessed 5 October 2019

Arendt H, 'Authority in the Twentieth Century' (1956) 18(4) The Review of Politics 403 <https://www.jstor.org/stable/1404647> accessed 5 October 2019

Arfi B, 'Auto-Immunity of Trust Without Trust' (2010) 6(2) Journal of International Political Theory 188 <https://journals.sagepub.com/doi/abs/10.3366/E1755088210000534> accessed 5 October 2019

Atkins EM, ''Domina et Regina Virtutum': Justice and Societas in "De Officiis"' (1990) 35(3) Phronesis 258 <https://www.jstor.org/stable/4182365> accessed 5 October 2019

Balkin J, 'Information Fiduciaries and the First Amendment' (2016) 49(4) UC Davis Law Review 1183 <https://lawreview.law.ucdavis.edu/issues/49/4/Lecture/49-4_Balkin.pdf> accessed 5 October 2019

Balsdon JPVD, 'Auctoritas, Dignitas, Otium' (1960) 10(1) The Classical Quarterly 43 <https://www.jstor.org/stable/637589> accessed 5 October 2019

Banfield A and Knopff R, 'Legislative versus Judicial Checks and Balances: Comparing Rights Policies Across Regimes' (2009) 44(1) Australian Journal of Political Science 13 <https://doi.org/10.1080/10361140802654968> accessed 5 October 2019

Baringhaus E, 'Trustee's Power to Delegate: A Comparative View' (1974) 50(2) Notre Dame Law Review 273 <https://scholarship.law.nd.edu/ndlr/vol50/iss2/5> accessed 5 October 2019

Barocas S and Selbst A, 'Big Data's Disparate Impact' (2016) 104(3) California Law Review 671 <http://dx.doi.org/10.15779/Z38BG31> accessed 5 October 2019

Benvenisti E, 'Toward Algorithmic Checks and Balances: A Rejoinder' (2018) 29(4) The European Journal of International Law 1087 <https://doi.org/10.1093/ejil/chy089> accessed 5 October 2019

— — and Downs G, 'Toward Global Checks and Balances' (2009) 20(3-4) Constitutional Political Economy 366 <https://doi.org/10.1007/s10602-008-9071-3> accessed 5 October 2019

Berk R, 'Accuracy and Fairness for Juvenile Justice Risk Assessments' (2019) 16(1) Journal of Empirical Legal Studies 175 <https://doi.org/10.1111/jels.12206> accessed 5 October 2019

— — and Bleich J, 'Forecasts of Violence to Inform Sentencing Decisions' (2014) 30(1) Journal of Quantitative Criminology 79 <https://doi.org/10.1007/s10940-013-9195-0> accessed 5 October 2019

Berman D, 'Re-Balancing Fitness, Fairness, and Finality for Sentences' (2014) 4(1) Wake Forest Journal of Law & Policy 151 <https://heinonline.org/HOL/P?h=hein.journals/wfjlapo4&i=155> accessed 5 October 2019

Berners-Lee T, Hendler J and Lassila O, 'The Semantic Web' (2001) 284(5) Scientific American 34

Birks P, 'Equity in the Modern Law: An Exercise in Taxonomy' (1996) 26(1) Western Australian Law Review 1 <https://heinonline.org/HOL/P?h=hein.journals/uwatlw26&i=21> accessed 5 October 2019

Blodgett M and Melconian L, 'Health-Care Nonprofits: Enhancing Governance and Public Trust' (2012) 117(2) Business and Society Review 197 <https://doi.org/10.1111/j.1467-8594.2012.00405.x> accessed 5 October 2019

Blodgett M, Melconian L and Peterson J, 'Social Enterprise: Reaffirming Public Purpose Governance Through Shared Value' (2016) 16(2) Journal of Business & Securities Law 305 <https://digitalcommons.law.msu.edu/jbsl/vol16/iss2/1/> accessed 5 October 2019

Bodó B and others, 'Tackling the Algorithmic Control Crisis – The Technical, Legal, and Ethical Challenges of Research into Algorithmic Agents' (2017) 19 Yale Journal of Law & Technology 133 <https://www.ivir.nl/publicaties/download/YJLT_2017.pdf> accessed 5 October 2019

boyd d and Crawford K, 'Critical Questions for Big Data: Provocations for a Cultural, Technological, and Scholarly Phenomenon' (2012) 15(5) Communication & Society 662 <https://doi.org/10.1080/1369118X.2012.678878> accessed 5 October 2019

Bozdag E, 'Bias in Algorithmic Filtering and Personalization' (2013) 15(3) Ethics and Information Technology 209 <https://doi.org/10.1007/s10676-013-9321-6> accessed 5 October 2019

Bracha O and Pasquale F, 'Federal Search Commission? Access, Fairness, and Accountability in the Law of Search' (2008) 93(6) Cornell Law Review 1149 <https://scholarship.law.cornell.edu/clr/vol93/iss6/11> accessed 5 October 2019

Bradach J and Eccles R, 'Price, Authority, and Trust: From Ideal Types to Plural Forms' (1989) 15 Annual Review of Sociology 97 <https://doi.org/10.1146/annurev.so.15.080189.000525> accessed 5 October 2019

Breach L, '*Fiducia* in Public Law' (2017) 48(3) Victoria University of Wellington Law Review 413 <https://heinonline.org/HOL/P?h=hein.journals/vuwlr48&i=417> accessed 5 October 2019

Broeders D and others, 'Big Data and Security Policies: Towards a Framework for Regulating the Phases of Analytics and Use of Big Data' (2017) 33(3) Computer Law & Security Review 309 <https://doi.org/10.1016/j.clsr.2017.03.002> accessed 5 October 2019

Brown P, 'Climate Change and the Planetary Trust' (1992) 20(3) Energy Policy 208 <https://doi.org/10.1016/0301-4215(92)90079-H> accessed 5 October 2019

Bruni L, 'Sustainability, Cognitive Technologies and the Digital Semiosphere' (2015) 18(1) International Journal of Cultural Studies 103 <https://doi.org/10.1177/1367877914528121> accessed 5 October 2019

Bumblauskas D and others, 'Big Data Analytics: Transforming Data to Action' (2017) 23(3) Business Process Management Journal 703 <https://doi.org/10.1108/BPMJ-03-2016-0056> accessed 5 October 2019

Butterworth M, 'The ICO and Artificial Intelligence: The Role of Fairness in the GDPR Framework' (2018) 34(2) Computer Law & Security Review 257 <https://doi.org/10.1016/j.clsr.2018.01.004> accessed 5 October 2019

Canito J and others, 'Unfolding the Relations between Companies and Technologies under the Big Data Umbrella' (2018) 99 Computers in Industry 1 <https://doi.org/10.1016/j.compind.2018.03.018> accessed 5 October 2019

Carpenter G, 'Judiciaries in the Spotlight' (2006) 39(3) Comparative and International Law Journal of Southern Africa 361 <https://heinonline.org/HOL/P?h=hein.journals/ciminsfri39&i=369> accessed 5 October 2019

Castillo M and others, 'Recommending Biomedical Resources: A Fuzzy Linguistic Approach Based on Semantic Web' (2010) 25(12) International Journal of Intelligent Systems 1143 <https://doi.org/10.1002/int.20447> accessed 5 October 2019

Chen W and Quan-Haase A, 'Big Data Ethics and Politics: Toward New Understandings' (2018) Social Science Computer Review (forthcoming) 1 <https://doi.org/10.1177/0894439318810734> accessed 5 October 2019

Citron DK and Pasquale F, 'The Scored Society: Due Process for Automated Predictions' (2014) 89(1) Washington Law Review 1

Cobb A and others, 'Big Data: More than Big Data Sets' (2018) 164(4) Surgery 640 <https://doi.org/10.1016/j.surg.2018.06.022> accessed 5 October 2019

Corbett C, 'How Sustainable Is Big Data?' (2018) 27(9) Production and Operations Management 1685 <https://doi.org/10.1111/poms.12837> accessed 5 October 2019

Cravens S, 'Judges as Trustees: A Duty to Account and an Opportunity for Virtue' (2005) 62 Washington and Lee Law Review 1637 <https://scholarlycommons.law.wlu.edu/wlulr/vol62/iss4/8/> accessed 5 October 2019

Criddle E, 'Liberty in Loyalty: A Republican Theory of Fiduciary Law' (2017) 95(5) Texas Law Review 993 <https://heinonline.org/HOL/P?h=hein.journals/tlr95&i=1039> accessed 5 October 2019

—— and Fox-Decent E, 'A Fiduciary Theory of Jus Cogens' (2009) 34(2) Yale Journal of International Law 331 <http://digitalcommons.law.yale.edu/yjil/vol34/iss2/3> accessed 5 October 2019

—— and Fox-Decent E, 'Keeping the Promise of Public Fiduciary Theory: A Reply to Leib and Galoob' (2016) 126 The Yale Law Journal Forum 192 <https://www.yalelawjournal.org/pdf/CriddleFoxDecentFinalPDF_4umqajnf.pdf> accessed 5 October 2019

Croce M, 'Epistemic Paternalism and the Service Conception of Epistemic Authority' (2018) 49(3) Metaphilosophy 305 <https://doi.org/10.1111/meta.12294> accessed 5 October 2019

Dahl R, 'The Concept of Power' (1957) 2(3) Behavioral Science 201 <https://doi.org/10.1002/bs.3830020303> accessed 5 October 2019

DeMott D, 'Beyond Metaphor: An Analysis of Fiduciary Obligation' (1988) 1988(37) Duke Law Journal 879 <https://scholarship.law.duke.edu/faculty_scholarship/332/> accessed 5 October 2019

DeValve M, 'Love/Power' (2017) 25(3) Critical Criminology 375 <https://doi.org/10.1007/s10612-016-9347-2> accessed 5 October 2019

Diakopoulos N, 'Algorithmic Accountability: Journalistic Investigation of Computational Power Structures' (2015) 3(3) Digital Journalism 398 <http://dx.doi.org/10.1080/21670811.2014.976411> accessed 5 October 2019

Doctorow C, 'Big Data: Welcome to the Petacentre' (2008) 455 Nature 16 <https://www.nature.com/news/2008/080903/full/455016a.html> accessed 5 October 2019

Doney P and Cannon J, 'An Examination of the Nature of Trust in Buyer-Seller Relationships' (1997) 61(2) Journal of Marketing 35 <https://www.jstor.org/stable/1251829> accessed 5 October 2019

Donnelly C, 'Leonard Cheshire Again and Beyond: Private Contractors, Contract and s.6(3)(b) of the Human Rights Act' (2005) 4 Public Law 785

Durán J and Formanek N, 'Grounds for Trust: Essential Epistemic Opacity and Computational Reliabilism' (2018) 28(4) Minds and Machines 645 <https://doi.org/10.1007/s11023-018-9481-6> accessed 5 October 2019

Dyer B, 'Determining the Content of Procedural Fairness' (1993) 19(1) Monash University Law Review 165 <https://heinonline.org/HOL/P?h=hein.journals/monash19&i=171> accessed 5 October 2019

Dzindolet M and others, 'The Role of Trust in Automation Reliance' (2003) 58(6) International Journal of Human-Computer Studies 697 <https://doi.org/10.1016/S1071-5819(03)00038-7> accessed 5 October 2019

Editorial, 'Towards Trustable Machine Learning' (2018) 2 Nature Biomedical Engineering 709 <https://www.nature.com/articles/s41551-018-0315-x> accessed 5 October 2019

Eijk G, 'Socioeconomic Marginality in Sentencing: The Built-in Bias in Risk Assessment Tools and the Reproduction of Social Inequality' (2017) 19(4) Punishment & Society 463 <https://doi.org/10.1177/1462474516666282> accessed 5 October 2019

Eijk N, Hoofnagle CJ and Kannekens E, 'Unfair Commercial Practices: A Complementary Approach to Privacy Protection' (2017) 3 European Data Protection Law Review 325

Ekbia H and others, 'Big Data, Bigger Dilemmas: A Critical Review' (2015) 66(8) Journal of the Association for Information Science and Technology 1523 <https://doi.org/10.1002/asi.23294> accessed 5 October 2019

Emerson R, 'Power-Dependence Relations' (1962) 27(1) American Sociological Review 31 <https://www.jstor.org/stable/2089716> accessed 5 October 2019

Emmert F, '*Stare Decisis*: A Universally Misunderstood Idea' (2012) 6(2) Legisprudence 207 <https://heinonline.org/HOL/P?h=hein.journals/legisp6&i=207> accessed 5 October 2019

Engel P, 'Is Epistemic Agency Possible?' (2013) 23(1) Philosophical Issues 158 <https://doi.org/10.1111/phis.12008> accessed 5 October 2019

Ernst R, 'Heading towards a Better World. Part 1: Wisdom, Compassion, and Personal Responsibility' (2016) 98(9) Toxicological & Environmental Chemistry 1084 <https://doi.org/10.1080/02772248.2015.1134531> accessed 5 October 2019

Fabbrini F, 'Reasonableness as a Test for Judicial Review of Legislation in the Jurisprudence of the French Constitutional Council' (2009) 4(1) Journal of Comparative Law

39
<https://pure.uvt.nl/ws/portalfiles/portal/1458799/Fabbrini_JCL_Reasonableness_as_a_test_for_judicial_review_in_France.pdf> accessed 5 October 2019

Fass T and others, 'The LSI-R and the COMPAS: Validation Data on Two Risk-Needs Tools' (2008) 35(9) Criminal Justice and Behavior 1095 <https://heinonline.org/HOL/P?h=hein.journals/crmjusbhv35&i=1054> accessed 5 October 2019

Finn P, 'Public Trusts, Public Fiduciaries' (2010) 38(3) Federal Law Review 335 <https://heinonline.org/HOL/P?h=hein.journals/fedlr38&i=343> accessed 5 October 2019

Fiske AP, 'The Four Elementary Forms of Sociality: Framework for a Unified Theory of Social Relations' (1992) 99(4) Psychological Review 689

Fitzgibbon DW, 'Institutional Racism, Pre-Emptive Criminalisation and Risk Analysis' (2007) 46(2) The Howard Journal of Criminal Justice 128 <https://doi.org/10.1111/j.1468-2311.2007.00461.x> accessed 5 October 2019

Flannigan R, 'Presumed Undue Influence: The False Partition from Fiduciary Accountability' (2015) 34(2) University of Queensland Law Journal 171 <https://heinonline.org/HOL/P?h=hein.journals/qland34&i=179> accessed 5 October 2019

Forbes JRS, 'Bias: Pressures on the Watson Test' (1989) 9(3) University of Tasmania Law Review 302 <https://heinonline.org/HOL/P?h=hein.journals/utasman9&i=310> accessed 5 October 2019

Foucault M, 'The Subject and Power' (1982) 8(4) Critical Inquiry 777 <http://www.jstor.org/stable/1343197> accessed 5 October 2019

Fox-Decent E, 'The Fiduciary Nature of State Legal Authority' (2005) 31(1) Queen's Law Journal 259 <https://heinonline.org/HOL/P?h=hein.journals/queen31&i=271> accessed 5 October 2019

— — 'Is the Rule of Law Really Indifferent to Human Rights?' (2008) 27(6) Law and Philosophy 533 <https://www.jstor.org/stable/27652667> accessed 5 October 2019

— — and Criddle E, 'The Fiduciary Constitution of Human Rights' (2009) 15(4) Legal Theory 301 <https://doi.org/10.1017/S1352325210000017> accessed 5 October 2019

Frankel T, 'Fiduciary Law' (1983) 71(3) California Law Review 795 <https://doi.org/10.15779/Z38W45K> accessed 5 October 2019

— — 'Fiduciary Duties as Default Rules' (1995) 74(4) Oregon Law Review 1209 <https://heinonline.org/HOL/P?h=hein.journals/orglr74&i=1219> accessed 5 October 2019

Freeman J, 'Private Parties, Public Functions and the New Administrative Law' (2000) 52(3) Administrative Law Review 813 <https://heinonline.org/HOL/P?h=hein.journals/admin52&i=825> accessed 5 October 2019

Freeman K, 'Algorithmic Injustice: How the Wisconsin Supreme Court Failed to Protect Due Process Rights in State v. Loomis' (2016) 18 North Carolina Journal of Law & Technology 75

Fuller L, 'Reason and Fiat in Case Law' (1946) 59(3) Harvard Law Review 376 <https://www.jstor.org/stable/1335588> accessed 5 October 2019

Fulmer A and Gelfand M, 'At What Level (and in Whom) We Trust: Trust Across Multiple Organizational Levels' (2012) 38(4) Journal of Management 1167 <https://doi.org/10.1177/0149206312439327> accessed 5 October 2019

Galimberti U, 'Man in the Age of Technology' (2009) 54(1) Journal of Analytical Psychology 3 <https://doi.org/10.1111/j.1468-5922.2008.01753.x> accessed 5 October 2019

Galoob S and Leib E, 'Intentions, Compliance, and Fiduciary Obligations' (2014) 20(2) Legal Theory 106 <https://doi.org/10.1017/S1352325214000032> accessed 5 October 2019

Glaeser E and others, 'Measuring Trust' (2000) 115(3) The Quarterly Journal of Economics 811 <https://doi.org/10.1162/003355300554926> accessed 5 October 2019

Goertz JP, 'The Rule of Law - Meaning and Significance for Security Policy and Reform' (1998) 7(3) European Security 101 <https://doi.org/10.1080/09662839808407375> accessed 5 October 2019

Grabner-Krauter S and Kaluscha E, 'Empirical Research in On-line Trust: A Review and Critical Assessment' (2003) 58(6) International Journal of Human-Computer Studies 783 <https://doi.org/10.1016/S1071-5819(03)00043-0> accessed 5 October 2019

Grimes AJ, 'Authority, Power, Influence and Social Control: A Theoretical Synthesis' (1978) 3(4) The Academy of Management Review 724 <https://www.jstor.org/stable/257928> accessed 5 October 2019

Grimmelikhuijsen S and Klijn A, 'The Effects of Judicial Transparency on Public Trust: Evidence from a Field Experiment' (2015) 93(4) Public Administration 995 <https://doi.org/10.1111/padm.12149> accessed 5 October 2019

Günther WA and others, 'Debating Big Data: A Literature Review on Realizing Value from Big Data' (2017) 26(3) The Journal of Strategic Information Systems 191 <https://doi.org/10.1016/j.jsis.2017.07.003> accessed 5 October 2019

Haas MC and Fischer SC, 'The Evolution of Targeted Killing Practices: Autonomous Weapons, Future Conflict, and the International Order' (2017) 38(2) Contemporary Security Policy 281 <https://doi.org/10.1080/13523260.2017.1336407> accessed 5 October 2019

Hamilton G, 'World Images, Authority, and Institutions: A Comparison of China and the West' (2010) 13(1) European Journal of Social Theory 31 <https://doi.org/10.1177/1368431009355860> accessed 5 October 2019

Hamp E, 'Fidēs and the Latin 5th Declension' (1997) 74(1) Glotta 54 <https://www.jstor.org/stable/40267040> accessed 5 October 2019

Hanif S, 'The Use of the Bystander Test for Apparent Bias' (2005) 10 Judicial Review 78 <https://heinonline.org/HOL/P?h=hein.journals/judire10&i=78> accessed 5 October 2019

Hannah-Moffat K, 'Algorithmic Risk Governance: Big Data Analytics, Race and Information Activism in Criminal Justice Debates' (2018) Theoretical Criminology (forthcoming) 1 <https://doi.org/10.1177/1362480618763582> accessed 5 October 2019

Harding M, 'Trust and Fiduciary Law' (2013) 33(1) Oxford Journal of Legal Studies 81 <https://doi.org/10.1093/ojls/gqs025> accessed 5 October 2019

Hardwig J, 'Epistemic Dependence' (1985) 82(7) The Journal of Philosophy 335 <http://www.jstor.org/stable/2026523> accessed 5 October 2019

Harner M, 'The Search for an Unbiased Fiduciary in Corporate Reorganizations' (2011) 86(2) Notre Dame Law Review 469 <https://scholarship.law.nd.edu/ndlr/vol86/iss2/1> accessed 5 October 2019

Harvard Law Review, 'Rethinking the Trust Doctrine in Federal Indian Law' (1984) 98(2) Harvard Law Review 422 <https://www.jstor.org/stable/1340843> accessed 5 October 2019

— — 'State v. Loomis: Wisconsin Supreme Court Requires Warning Before Use of Algorithmic Risk Assessments in Sentencing' (2017) 130(5) Harvard Law Review 1530 <https://harvardlawreview.org/2017/03/state-v-loomis/> accessed 5 October 2019

Hawley J, Johnson K and Waitzer E, 'Reclaiming Fiduciary Duty Balance' (2011) 4(2) Rotman International Journal of Pension Management 4

<http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=65592665&site=ehost-live> accessed 5 October 2019

Heiskanen A, Newman M and Eklin M, 'Control, Trust, Power, and the Dynamics of Information System Outsourcing Relationships: A Process Study of Contractual Software Development' (2008) 17(4) The Journal of Strategic Information Systems 268 <https://doi.org/10.1016/j.jsis.2008.10.001> accessed 5 October 2019

Hendler J, 'Agents and the Semantic Web' (2001) 16(2) IEEE Intelligent Systems 30 <https://ieeexplore.ieee.org/document/920597> accessed 5 October 2019.

Hermann D, 'The Fallacy of Legal Procedure as Predominant over Substantive Justice: A Critique of the Rule of Law in John Rawls' *A Theory of Justice*' (1974) 23(4) DePaul Law Review 1408 <https://heinonline.org/HOL/P?h=hein.journals/deplr23&i=1424> accessed 5 October 2019

Hicks A, 'The Remedial Principle of *Keech v. Sandford* Reconsidered' (2010) 69(2) The Cambridge Law Journal 287 <https://doi.org/10.1017/S0008197310000486> accessed 5 October 2019

Hirsch D, 'That's Unfair! Or Is It? Big Data, Discrimination and the FTC's Unfairness Authority' (2014) 103 Kentucky Law Journal 345 <http://www.kentuckylawjournal.org/wp-content/uploads/2015/02/103KyLJ345.pdf> accessed 5 October 2019

Hofmann E and others, 'Enhancing Tax Compliance through Coercive and Legitimate Power of Tax Authorities by Concurrently Diminishing or Facilitating Trust in Tax Authorities' (2014) 36(3) Law & Policy 290 <https://doi.org/10.1111/lapo.12021> accessed 5 October 2019

Holsinger A, Lowenkamp C and Latessa E, 'Exploring the Validity of the Level of Service Inventory-Revised with Native American Offenders' (2006) 34(3) Journal of Criminal Justice 331 <https://doi.org/10.1016/j.jcrimjus.2006.03.009> accessed 5 October 2019

Hope A, 'Governmentality and the 'Selling' of School Surveillance Devices' (2015) 63(4) The Sociological Review 840 <https://doi.org/10.1111/1467-954X.12279> accessed 5 October 2019

Höpfl H, 'Power, Authority and Legitimacy' (1999) 2(3) Human Resource Development International 217 <https://doi.org/10.1080/13678869900000024> accessed 5 October 2019

Hornikx J, 'Epistemic Authority of Professors and Researchers: Differential Perceptions by Students from Two Cultural-Educational Systems' (2011) 14(2) Social Psychology of Education 169 <https://doi.org/10.1007/s11218-010-9139-6> accessed 5 October 2019

Horvath R, 'Machine Space' (1974) 64(2) The Geographical Review 167

Hosmer LT, 'Trust: The Connecting Link between Organizational Theory and Philosophical Ethics' (1995) 20(2) The Academy of Management Review 379 <https://www.jstor.org/stable/258851> accessed 5 October 2019

Hosni H and Vulpiani A, 'Forecasting in Light of Big Data' (2018) 31(4) Philosophy & Technology 557 <https://doi.org/10.1007/s13347-017-0265-3> accessed 5 October 2019

Howard-Snyder D, 'Pistis, Fides, and Propositional Belief' (2018) 54(4) Religious Studies 585 <https://doi.org/10.1017/S0034412517000452> accessed 5 October 2019

Hsee C, 'Elastic Justification: How Unjustifiable Factors Influence Judgments' (1996) 66(1) Organizational Behavior and Human Decision Processes 122 <https://doi.org/10.1006/obhd.1996.0043> accessed 5 October 2019

Hurlburt G and Voas J, 'Big Data, Networked Worlds' (2014) 47(4) Computer 84 <https://ieeexplore.ieee.org/document/6798583> accessed 5 October 2019

Hynes D, 'Fiduciary Duties and RUPA: An Inquiry into Freedom of Contract' (1995) 58(2) Law and Contemporary Problems 29 <https://scholarship.law.duke.edu/lcp/vol58/iss2/3/> accessed 5 October 2019

— — 'Freedom of Contract, Fiduciary Duties, and Partnerships: The Bargain Principle and the Law of Agency' (1997) 54(2) Washington and Lee Law Review 439 <https://heinonline.org/HOL/P?h=hein.journals/waslee54&i=451> accessed 5 October 2019

Introna L, 'Algorithms, Governance, and Governmentality: On Governing Academic Writing' (2016) 41(1) Science, Technology, & Human Values 17 <https://doi.org/10.1177/0162243915587360> accessed 5 October 2019

Ip E, 'The Judicial Review of Legislation in the United Kingdom: A Public Choice Analysis' (2014) 37(2) European Journal of Law and Economics 221 <https://doi.org/10.1007/s10657-011-9281-4> accessed 5 October 2019

Jackman IM, 'Restitution for Wrongs' (1989) 48(2) The Cambridge Law Journal 302 <https://www.jstor.org/stable/4507288> accessed 5 October 2019

Jacobs L, 'From Rawls to Habermas: Towards A Theory of Grounded Impartiality in Canadian Administrative Law' (2014) 51(2) Osgoode Hall Law Journal 543 <https://digitalcommons.osgoode.yorku.ca/ohlj/vol51/iss2/5/> accessed 5 October 2019

Jarvenpaa S and Leidner D, 'Communication and Trust in Global Virtual Teams' (1999) 10(6) Organization Science 791 <https://doi.org/10.1287/orsc.10.6.791> accessed 5 October 2019

Johnson L, 'After *Enron*: Remembering Loyalty Discourse in Corporate Law' (2003) 28 Delaware Journal of Corporate Law 27 <http://www.djcl.org/wp-content/uploads/2014/08/After-Enron-REMEMBERING-LOYALTY-DISCOURSE-IN-CORPORATE-LAW.pdf> accessed 5 October 2019

Jordan M and Mitchell T, 'Machine Learning: Trends, Perspectives, and Prospects' (2015) 349(6245) Science 255 <http://science.sciencemag.org/content/349/6245/255.full> accessed 5 October 2019

Kane J, 'Justice, Impartiality, and Equality: Why the Concept of Justice Does Not Presume Equality' (1996) 24(3) Political Theory 375 <https://www.jstor.org/stable/191918> accessed 5 October 2019

Katsafanas P, 'Nietzsche's Account of Self-Conscious Agency' (2018) 21(1) Philosophical Explorations 122 <https://doi.org/10.1080/13869795.2017.1421695> accessed 5 October 2019

Keating F and Robertson D, 'Fear, Black People and Mental Illness: A Vicious Circle?' (2004) 12(5) Health and Social Care in the Community 439 <https://doi.org/10.1111/j.1365-2524.2004.00506.x> accessed 5 October 2019

Kemper T, 'Predicting Emotions from Social Relations' (1991) 54(4) Social Psychology Quarterly 330 <https://www.jstor.org/stable/2786845> accessed 5 October 2019

Kersting K and Meyer U, 'From Big Data to Big Artificial Intelligence? Algorithmic Challenges and Opportunities of Big Data' (2018) 32(1) Künstliche Intelligenz 3 <https://doi.org/10.1007/s13218-017-0523-7> accessed 5 October 2019

Keymolen E and Hof (van der) S, 'Can I Still Trust You, My Dear Doll? A Philosophical and Legal Exploration of Smart Toys and Trust' (2019) Journal of Cyber Policy 1 <https://doi.org/10.1080/23738871.2019.1586970> accessed 5 October 2019

— — 'Trust in the Networked Era: When Phones Become Hotel Keys' (2018) 22(1) Techné: Research in Philosophy and Technology 51

<https://www.pdcnet.org/techne/content/techne_2018_0022_0001_0051_0075> accessed 5 October 2019

Khan Z and Vorley T, 'Big Data Text Analytics: An Enabler of Knowledge Management' (2017) 21(1) Journal of Knowledge Management 18 <https://doi.org/10.1108/JKM-06-2015-0238> accessed 5 October 2019

Kilgour J, 'The Department of Labor's Final Rule on Fiduciary Responsibility' (2015) 47(5-6) Compensation & Benefits Review 232 <https://doi.org/10.1177/0886368716679616> accessed 5 October 2019

Kinder P, 'New Fiduciary Duties in a Changing Social Environment' (2005) 14(3) Journal of Investing 24 <https://search.proquest.com/docview/220761681?accountid=14338> accessed 5 October 2019

Kiran A and Verbeek PP, 'Trusting Our Selves to Technology' (2010) 23(3-4) Knowledge, Technology & Policy 409 <https://doi.org/10.1007/s12130-010-9123-7> accessed 5 October 2019

Kodelja Z, 'Authority, the Autonomy of The University, and Neoliberal Politics' (2013) 63(3) Educational Theory 317 <https://doi.org/10.1111/edth.12026> accessed 5 October 2019

Koi P, Uusitalo S and Tuominen J, 'Self-Control in Responsibility Enhancement and Criminal Rehabilitation' (2018) 12(2) Criminal Law and Philosophy 227 <https://doi.org/10.1007/s11572-017-9423-z> accessed 5 October 2019

Koops BJ, 'Law, Technology, and Shifting Power Relations' (2010) 25(2) Berkeley Technology Law Journal 973 <https://doi.org/10.15779/Z38V11F> accessed 5 October 2019

Koslowsky M and Stashevsky S, 'Organizational Values and Social Power' (2005) 26(1) International Journal of Manpower 23 <https://doi.org/10.1108/01437720510587253> accessed 5 October 2019

Kraska T, 'Finding the Needle in the Big Data Systems Haystack' (2013) 17(1) IEEE Internet Computing 84 <https://ieeexplore.ieee.org/document/6415919> accessed 5 October 2019

Kroll J and others, 'Accountable Algorithms' (2017) 165 University of Pennsylvania Law Review 633 <https://scholarship.law.upenn.edu/penn_law_review/vol165/iss3/3/> accessed 5 October 2019

Kruglanski A and others, 'Says Who?: Epistemic Authority Effects in Social Judgment' (2005) 37 Advances in Experimental Social Psychology 345 <https://doi.org/10.1016/S0065-2601(05)37006-7> accessed 5 October 2019

Kruglanski A and others, 'Three Decades of Lay Epistemics: The Why, How, and Who of Knowledge Formation' (2009) 20(1) European Review of Social Psychology 146 <https://doi.org/10.1080/10463280902860037> accessed 5 October 2019

Kuner C and others, 'Expanding the Artificial Intelligence-Data Protection Debate' (2018) 8(4) International Data Privacy Law 289 <https://doi.org/10.1093/idpl/ipy024> accessed 5 October 2019

Kutner L and Koven H, 'Charitable Trust Legislation in the Several States' (1966) 61(3) Northwestern University Law Review 411 <https://heinonline.org/HOL/P?h=hein.journals/illlr61&i=423> accessed 5 October 2019

L'Heureux-Dubé C, 'Beyond the Myths: Equality, Impartiality, and Justice' (2001) 10(1) Journal of Social Distress and the Homeless 87 <https://doi.org/10.1023/A:1009433703175> accessed 5 October 2019

Laby A, 'The Fiduciary Obligation as the Adoption of Ends' (2008) 56(1) Buffalo Law Review 99 <https://heinonline.org/HOL/P?h=hein.journals/buflr56&i=107> accessed 5 October 2019

Lanning G, 'The Crown-Maori Relationship: The Spectre of a Fiduciary Relationship' (1999) 8 Auckland University Law Review 445

LeCun Y, Bengio Y and Hinton G, 'Deep learning' (2015) 521 Nature 436 <https://www.nature.com/articles/nature14539> accessed 5 October 2019

Lee S, 'Impartiality in the Judiciary' (1987) 14(2) The University of Queensland Law Journal 136 <http://classic.austlii.edu.au/au/journals/UQLawJl/1987/13.pdf> accessed 5 October 2019

Leib E, 'Friends as Fiduciaries' (2009) 86(3) Washington University Law Review 665 <https://heinonline.org/HOL/P?h=hein.journals/walq86&i=671> accessed 5 October 2019

— — and Ponet D, 'Fiduciary Representation and Deliberative Engagement with Children' (2012) 20(2) The Journal of Political Philosophy 178 <https://doi.org/10.1111/j.1467-9760.2011.00398.x> accessed 5 October 2019

— — Ponet D and Serota M, 'Translating Fiduciary Principles into Public Law' (2012-2013) 126 Harvard Law Review Forum 91 <https://heinonline.org/HOL/P?h=hein.journals/forharoc126&i=86> accessed 5 October 2019

— — Ponet D and Serota M, 'A Fiduciary Theory of Judging' (2013) 101(3) California Law Review 699 <https://doi.org/10.15779/Z38N529> accessed 5 October 2019

Lepri B and others, 'Fair, Transparent, and Accountable Algorithmic Decision-making Processes: The Premise, the Proposed Solutions, and the Open Challenges' (2018) 31(4) Philosophy & Technology 611 <https://doi.org/10.1007/s13347-017-0279-x> accessed 5 October 2019

Leslie M, 'Trusting Trustees: Fiduciary Duties and the Limits of Default Rules' (2005) 94(1) Georgetown Law Journal 67 <https://heinonline.org/HOL/P?h=hein.journals/glj94&i=79> accessed 5 October 2019

Leszczyński D, 'Inconsistency, Uncertainty and Epistemic Authority' (2014) 6(4) European Journal for Philosophy of Religion 145 <http://search.ebscohost.com/login.aspx?direct=true&db=lsdar&AN=ATLAiG0V180731001456&site=ehost-live> accessed 5 October 2019

Lewis D and Weigert A, 'Trust as a Social Reality' (1985) 63(4) Social Forces 967 <https://www.jstor.org/stable/2578601> accessed 5 October 2019

Lewis P, 'Uncertainty, Power and Trust' (2008) 21 The Review of Austrian Economics 183 <https://doi.org/10.1007/s11138-007-0038-9> accessed 5 October 2019

Liang F and others, 'Constructing a Data-Driven Society: China's Social Credit System as a State Surveillance Infrastructure' (2018) 10(4) Policy and Internet 415 <https://doi.org/10.1002/poi3.183> accessed 5 October 2019

Licht A, 'Lord Eldon Redux: Information Asymmetry, Accountability and Fiduciary Loyalty' (2017) 37(4) Oxford Journal of Legal Studies 770 <https://doi.org/10.1093/ojls/gqx003> accessed 5 October 2019

Lipton Z, 'The Mythos of Model Interpretability' (2018) 16(3) ACM Queue - Machine Learning <https://dl.acm.org/citation.cfm?id=3236386.3241340> accessed 5 October 2019.

Lipworth W and others, 'Ethics and Epistemology in Big Data Research' (2017) 14(4) Journal of Bioethical Inquiry 489 <https://doi.org/10.1007/s11673-017-9771-3> accessed 5 October 2019

Lui H, 'A Fiduciary Perspective on the State's Duty to Protect the Environment' (2014) 20 Auckland University Law Review 101 <https://heinonline.org/HOL/P?h=hein.journals/auck20&i=99> accessed 5 October 2019

Malgieri G and Comandé G, 'Why a Right to Legibility of Automated Decision-Making Exists in the General Data Protection Regulation' (2017) 7(4) International Data Privacy Law 243 <https://doi.org/10.1093/idpl/ipx019> accessed 5 October 2019

Malgieri G and Custers B, 'Pricing Privacy – The Right to Know the Value of Your Personal Data' (2018) 34(2) Computer Law & Security Review 289 <https://doi.org/10.1016/j.clsr.2017.08.006> accessed 5 October 2019

Malleson K, 'Safeguarding Judicial Impartiality' (2002) 22(1) Legal Studies 53 <https://doi.org/10.1111/j.1748-121X.2002.tb00579.x> accessed 5 October 2019

Marchetti G, 'Consciousness: A Unique Way of Processing Information' (2018) 19(3) Cognitive Processing 435 <https://doi.org/10.1007/s10339-018-0855-8> accessed 5 October 2019

Martini F, 'Hearsay Viewed Through the Lens of Trust, Reputation and Coherence' (2017) 194(10) Synthese 4083 <https://doi.org/10.1007/s11229-016-1128-7> accessed 5 October 2019

May C, 'Market Exchange and the Rule of Law: Confidence in Predictability' (2018) 10(2) Hague Journal on the Rule of Law 365 <https://doi.org/10.1007/s40803-017-0067-9> accessed 5 October 2019

Mayer M, 'The New Killer Drones: Understanding the Strategic Implications of Next-Generation Unmanned Combat Aerial Vehicles' (2015) 91(4) International Affairs 765 <https://doi.org/10.1111/1468-2346.12342> accessed 5 October 2019

McCamus J, 'Prometheus Unbound: Fiduciary Obligation in the Supreme Court of Canada' (1997) 28(1) Canadian Business Law Journal 104 <https://digitalcommons.osgoode.yorku.ca/scholarly_works/1497/> accessed 5 October 2019

Meierhenry J, 'The Due Process Right to an Unbiased Adjudicator in Administrative Proceedings' (1991) 36(3) South Dakota Law Review 551 <https://heinonline.org/HOL/P?h=hein.journals/sdlr36&i=563> accessed 5 October 2019

Mendelson D, 'Legal Protections for Personal Health Information in the Age of Big Data – A Proposal for Regulatory Framework' (2017) 3(1) Ethics, Medicine and Public Health 37 <https://doi.org/10.1016/j.jemep.2017.02.005> accessed 5 October 2019

Meron T, 'Judicial Independence and Impartiality in International Criminal Tribunals' (2005) 99(2) The American Journal of International Law 359 <https://doi.org/10.2307/1562502> accessed 5 October 2019

Milewski A and Lewis S, 'Delegating to Software Agents' (1997) 46(4) International Journal of Human-Computer Studies 485 <https://doi.org/10.1006/ijhc.1996.0100> accessed 5 October 2019

Miller J, 'The Science of Law: The Maturing of Jurisprudence into Fundamental Principles in Fairness' (1986) 13(2) Western State University Law Review 367 <https://heinonline.org/HOL/P?h=hein.journals/wsulr13&i=373> accessed 5 October 2019

Miller P, 'A Theory of Fiduciary Liability' (2011) 56(2) McGill Law Journal 235 <https://doi.org/10.7202/1002367ar> accessed 5 October 2019

—— 'Justifying Fiduciary Duties' (2013) 58(4) McGill Law Journal 969 <https://www.erudit.org/fr/revues/mlj/2013-v58-n4-mlj0866/1019051ar/> accessed 5 October 2019

— — 'Justifying Fiduciary Remedies' (2013) 63(4) University of Toronto Law Journal 570 <https://heinonline.org/HOL/P?h=hein.journals/utlj63&i=584> accessed 5 October 2019

— — and Gold A, 'Fiduciary Governance' (2015) 57(2) William & Mary Law Review 513 <https://scholarship.law.wm.edu/wmlr/vol57/iss2/4/> accessed 5 October 2019

Molm L, 'Is Punishment Effective? Coercive Strategies in Social Exchange' (1994) 57(2) Social Psychology Quarterly 75 <https://www.jstor.org/stable/2786703> accessed 5 October 2019

Morgner C, 'Trust and Confidence: History, Theory and Socio-Political Implications' (2013) 36(4) Human Studies 509 <https://doi.org/10.1007/s10746-013-9281-1> accessed 5 October 2019

Morreim H, 'The Clinical Investigator as Fiduciary: Discarding a Misguided Idea' (2005) 33(3) The Journal of Law, Medicine & Ethics 586 <https://doi.org/10.1111/j.1748-720X.2005.tb00521.x> accessed 5 October 2019

Mureinik E, 'Reconsidering Review: Participation and Accountability' (1993) 1993 Acta Juridica 35 <https://heinonline.org/HOL/P?h=hein.journals/actj1993&i=41> accessed 5 October 2019

— — 'A Bridge to Where? Introducing the Interim Bill of Rights' (1994) 10(1) South African Journal on Human Rights 31 <https://heinonline.org/HOL/P?h=hein.journals/soafjhr10&i=39> accessed 5 October 2019

Musiker D, France T and Hallenbeck L, 'The Public Trust and *Parens Patriae* Doctrines: Protecting Wildlife in Uncertain Political Times' (1995) 16 Public Land Law Review 87 <https://scholarship.law.umt.edu/cgi/viewcontent.cgi?article=1198&context=plrlr> accessed 5 October 2019

Nachbar T, 'The Rationality of Rational Basis Review' (2016) 102(7) Virginia Law Review 1627 <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=119438154&site=ehost-live> accessed 5 October 2019

Nacol E, 'The Risks of Political Authority: Trust, Knowledge and Political Agency in Locke's *Second Treatise*' (2011) 59(3) Political Studies 580 <https://doi.org/10.1111/j.1467-9248.2010.00878.x> accessed 5 October 2019

Nedelsky J, 'Embodied Diversity and the Challenges to Law' (1997) 42 McGill Law Journal 91 <http://www.lawjournal.mcgill.ca/userfiles/other/5576315-42.Nedelsky.pdf> accessed 5 October 2019

Neitz MB, 'Socioeconomic Bias in the Judiciary' (2013) 61(1) Cleveland State Law Review 137 <https://heinonline.org/HOL/P?h=hein.journals/clevslr61&i=141> accessed 5 October 2019

Nelson B, 'Faith and Sheep's Guts in *Much Ado About Nothing*' (2016) 12(2) Shakespeare 161 <https://doi.org/10.1080/17450918.2014.968607> accessed 5 October 2019

Newell S and Marabelli M, 'Strategic Opportunities (and Challenges) of Algorithmic Decision-Making: A Call for Action on the Long-Term Societal Effects of 'Datafication'' (2015) 24(1) The Journal of Strategic Information Systems 3 <https://doi.org/10.1016/j.jsis.2015.02.001> accessed 5 October 2019

Njuguna C and McSharry P, 'Constructing Spatiotemporal Poverty Indices from Big Data' (2017) 70 Journal of Business Research 318 <https://doi.org/10.1016/j.jbusres.2016.08.005> accessed 5 October 2019

O'Hara K, 'Data, Legibility, Creativity … and Power' (2015) 19(2) IEEE Internet Computing 88 <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7061804> accessed 5 October 2019

Origgi G, 'A Social Epistemology of Reputation' (2012) 26(3-4) Social Epistemology 399 <https://doi.org/10.1080/02691728.2012.727193> accessed 5 October 2019

Padovano F, Sgarra G and Fiorino N, 'Judicial Branch, Checks and Balances and Political Accountability' (2003) 14(1) Constitutional Political Economy 47 <https://doi.org/10.1023/A:1022347908667> accessed 5 October 2019

Pagallo U, 'Algo-Rhythms and the Beat of the Legal Drum' (2018) 31(4) Philosophy & Technology 507 <https://doi.org/10.1007/s13347-017-0277-z> accessed 5 October 2019

Palmer S, 'Public Functions and Private Services: A Gap in Human Rights Protection' (2008) 6(3-4) International Journal of Constitutional Law 585 <https://doi.org/10.1093/icon/mon027> accessed 5 October 2019

Papayannis D, 'Independence, Impartiality and Neutrality in Legal Adjudication' (2016) 28 Revus Journal for Constitutional Theory and Philosophy of Law 33 <http://journals.openedition.org/revus/3546> accessed 5 October 2019

Pasquale F, 'Grand Bargains for Big Data: The Emerging Law of Health Information' (2013) 72(3) Maryland Law Review 682

Pavel AP, Fruth A and Neacsu MN, 'ICT and E-Learning – Catalysts for Innovation and Quality in Higher Education' (2015) 23 Procedia Economics and Finance 704 <https://doi.org/10.1016/S2212-5671(15)00409-8> accessed 5 October 2019

Pažout A, 'Roman Pietas and Herod the Great' (2015) 19(1-2) Studia Hercynia 206 <http://cejsh.icm.edu.pl/cejsh/element/bwmeta1.element.desklight-3c728f34-268a-4027-b6f9-97b81e9eec39> accessed 5 October 2019

Pierson R, 'The Epistemic Authority of Expertise' (1994) 1 PSA 398 <https://www.jstor.org/stable/193044> accessed 5 October 2019

Polonetsky J and Tene O, 'Privacy and Big Data: Making Ends Meet' (2013) 66 Stanford Law Review Online 25 <https://cyberlaw.stanford.edu/files/publication/files/PolonetskyTene.pdf> accessed 5 October 2019

Poole T, 'Procedural Fairness in Dismissals: Towards a 'Due Process' Approach?' (1998) 27(3) Industrial Law Journal 233 <http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=80104947&site=ehost-live> accessed 5 October 2019

Porat A and Strahilevitz LJ, 'Personalizing Default Rules and Disclosure with Big Data' (2014) 112(8) Michigan Law Review 1417 <http://repository.law.umich.edu/mlr/vol112/iss8/2> accessed 5 October 2019

Provost F and Fawcett T, 'Data Science and its Relationship to Big Data and Data-Driven Decision Making' (2013) 1(1) Big Data 51 <https://doi.org/10.1089/big.2013.1508> accessed 5 October 2019

Puddifoot K, 'A Defence of Epistemic Responsibility: Why Laziness and Ignorance Are Bad after All' (2014) 191(14) Synthese 3297 <https://doi.org/10.1007/s11229-014-0445-y> accessed 5 October 2019

Pustovit S and Williams E, 'Philosophical Aspects of Dual Use Technologies' (2010) 16(1) Science and Engineering Ethics 17 <https://doi.org/10.1007/s11948-008-9086-1> accessed 5 October 2019

Raven B, Schwarzwald J and Koslowsky M, 'Conceptualizing and Measuring a Power/Interaction Model of Interpersonal Influence' (1998) 28(4) Journal of Applied Social Psychology 307 <https://doi.org/10.1111/j.1559-1816.1998.tb01708.x> accessed 5 October 2019

Rawls J, 'Outline of a Decision Procedure for Ethics' (1951) 60(2) The Philosophical Review 177 <https://www.jstor.org/stable/2181696> accessed 5 October 2019

Raz J, 'Legal Principles and the Limits of Law' (1972) 81(5) Yale Law Journal 823 <https://heinonline.org/HOL/P?h=hein.journals/ylr81&i=841> accessed 5 October 2019

Redish M and Marshall L, 'Adjudicatory Independence and the Values of Procedural Due Process' (1986) 95(3) The Yale Law Journal 455 <https://doi.org/10.2307/796487> accessed 5 October 2019

Reed P, 'Epistemic Authority in Nursing Practice vs. Doctors' Orders' (2016) 29(3) Nursing Science Quarterly 241 <https://doi.org/10.1177/0894318416647356> accessed 5 October 2019

Rempel J, Holmes J and Zanna M, 'Trust in Close Relationships' (1985) 49(1) Journal of Personality and Social Psychology 95 <https://pdfs.semanticscholar.org/4727/fcf320e6f8c3a8bbd9d7bac22708825f48ad.pdf> accessed 5 October 2019

Richards N and Hartzog W, 'Taking Trust Seriously in Privacy Law' (2016) 19 Stanford Technology Law Review 431 <http://dx.doi.org/10.2139/ssrn.2655719> accessed 5 October 2019

Roberts AJ, 'Epistemic Authority and Genuine Ethical Controversies' (2017) 31(4) Bioethics 321 <https://doi.org/10.1111/bioe.12341> accessed 5 October 2019

Rosen A, 'Two Logics of Authority in Modern Law' (2014) 64(5) University of Toronto Law Journal 669 <https://heinonline.org/HOL/P?h=hein.journals/utlj64&i=679> accessed 5 October 2019

Rowe G, 'Reconsidering the *Auctoritas* of Augustus' (2013) 103 The Journal of Roman Studies 1 <https://www.jstor.org/stable/43286777> accessed 5 October 2019

Rowley J, 'The Wisdom Hierarchy: Representations of the DIKW Hierarchy' (2007) 33(2) Journal of Information Science 163 <https://doi.org/10.1177/0165551506070706> accessed 5 October 2019

Sabherwal R, 'The Role of Trust in Outsourced IS Development Projects' (1999) 42(2) Communications of the ACM 80 <https://dl.acm.org/citation.cfm?id=293485> accessed 5 October 2019

Sætra HS, 'Science as a Vocation in the Era of Big Data: The Philosophy of Science behind Big Data and Humanity's Continued Part in Science' (2018) 52(4) Integrative Psychological and Behavioral Science 508 <https://doi.org/10.1007/s12124-018-9447-5> accessed 5 October 2019

Samtani A and Sharmaine WKL, 'Can and Should Culture Be Copyrighted?' (2018) 40(9) European Intellectual Property Review 553

Samuelson W and Zeckhauser R, 'Status Quo Bias in Decision Making' (1988) 1(1) Journal of Risk and Uncertainty 7 <https://doi.org/10.1007/BF00055564> accessed 5 October 2019

Santangelo F, 'Priestly *Auctoritas* in the Roman Republic' (2013) 63(2) Classical Quarterly 743 <https://doi.org/10.1017/S0009838813000220> accessed 5 October 2019

Scalia A, 'The Rule of Law as a Law of Rules' (1989) 56(4) University of Chicago Law Review 1175 <https://heinonline.org/HOL/P?h=hein.journals/uclr56&i=1185> accessed 5 October 2019

Schermer B, 'The Limits of Privacy in Automated Profiling and Data Mining' (2011) 27(1) Computer Law & Security Review 45 <https://doi.org/10.1016/j.clsr.2010.11.009> accessed 5 October 2019

Schovsbo J, Riis T and Petersen CS, 'The Unified Patent Court: Pros and Cons of Specialization - Is There a Light at the End of the Tunnel (Vision)?' (2015) 46(3) International Review of Intellectual Property and Competition Law 271

Scott E and Scott R, 'Parents as Fiduciaries' (1995) 81(8) Virginia Law Review 2401 <https://www.jstor.org/stable/1073583> accessed 5 October 2019

Selbst A and Powles J, 'Meaningful Information and the Right to Explanation' (2017) 7(4) International Data Privacy Law 233 <https://doi.org/10.1093/idpl/ipx022> accessed 5 October 2019

Shankaracharya and others, 'Computational Intelligence in Early Diabetes Diagnosis: A Review' (2010) 7(4) The Review of Diabetic Studies 252 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3143540/> accessed 5 October 2019

Sieben I and Halman L, 'Morality and the Public Good in Post-Socialist European States' (2015) 7(1) Studies of Transition States and Societies 7 <https://research.tilburguniversity.edu/en/publications/morality-and-the-public-good-in-post-socialist-european-states> accessed 5 October 2019

Silverman D, Slemrod J and Uler N, 'Distinguishing the Role of Authority "In" and Authority "To"' (2014) 113 Journal of Public Economics 32 <https://doi.org/10.1016/j.jpubeco.2014.02.003> accessed 5 October 2019

Silving H, 'The Twilight Zone of Positive and Natural Law' (1955) 43(3) California Law Review 477 <https://doi.org/10.15779/Z38D20X> accessed 5 October 2019

Simpson T, 'Telepresence and Trust: A Speech-Act Theory of Mediated Communication' (2017) 30(4) Philosophy & Technology 443 <https://doi.org/10.1007/s13347-016-0233-3> accessed 5 October 2019

Sinclair J, 'Advertising and Media in the Age of the Algorithm' (2016) 10 International Journal of Communication 3522

Singh A and Teng J, 'Enhancing Supply Chain Outcomes through Information Technology and Trust' (2016) 54 Computers in Human Behavior 290 <https://doi.org/10.1016/j.chb.2015.07.051> accessed 5 October 2019

Skeem J and Lowenkamp C, 'Risk, Race, and Recidivism: Predictive Bias and Disparate Impact' (2016) 54(4) Criminology 680 <https://heinonline.org/HOL/P?h=hein.journals/crim54&i=680> accessed 5 October 2019

Sloot (van der) B, 'The Practical and Theoretical Problems with 'Balancing': *Delfi*, *Coty* and the Redundancy of the Human Rights Framework' (2016) 23(3) Maastricht Journal of European and Comparative Law 439 <https://doi.org/10.1177/1023263X1602300304> accessed 5 October 2019

Smith G, 'The Critical Resource Theory of Fiduciary Duty' (2002) 55(5) Vanderbilt Law Review 1399 <https://heinonline.org/HOL/P?h=hein.journals/vanlr55&i=1413> accessed 5 October 2019

Smith L, 'Fiduciary Relationships: Ensuring the Loyal Exercise of Judgement on Behalf of Another' (2014) 130 The Law Quarterly Review 608 <https://www.westlaw.com/Document/I20895100342211E499A193CC737971DF/View/Full

Text.html?transitionType=Default&contextData=(sc.Default)&VR=3.0&RS=cblt1.0>
accessed 5 October 2019

Sossin L, 'An Intimate Approach to Fairness, Impartiality and Reasonableness in Administrative Law' (2002) 27(2) Queen's Law Journal 809 <https://heinonline.org/HOL/P?h=hein.journals/queen27&i=821> accessed 5 October 2019

Sperber D and others, 'Epistemic Vigilance' (2010) 25(4) Mind and Language 359 <https://doi.org/10.1111/j.1468-0017.2010.01394.x> accessed 5 October 2019

Stanton T, 'Authority and Freedom in the Interpretation of Locke's Political Theory' (2011) 39(1) Political Theory 6 <https://doi.org/10.1177/0090591710386571> accessed 5 October 2019

Sweeney JMG, 'Lord O'Brien's Doctrine of Bias' (1972) 7(1) Irish Jurist 17 <https://heinonline.org/HOL/P?h=hein.journals/irishjur7&i=23> accessed 5 October 2019

Teele R, 'The search for the Fiduciary Principle: A Rescue Operation' (1996) 24(2) Australian Business Law Review 110 <https://search.proquest.com/docview/223522999?accountid=14338> accessed 5 October 2019

Tene O and Polonetsky J, 'Judged by The Tin Man: Individual Rights in the Age of Big Data' (2013) 11 Journal of Telecommunications and High Technology Law 351

Tian X and Liu L, 'Does Big Data Mean Big Knowledge? Integration of Big Data Analysis and Conceptual Model for Social Commerce Research' (2017) 17(1) Electronic Commerce Research 169 <https://doi.org/10.1007/s10660-016-9242-7> accessed 5 October 2019

Tsele M, 'Coercing Virtue in the Constitutional Court: Neutral Principles, Rationality and the Nkandla Problem' (2016) 8 Constitutional Court Review 193 <https://heinonline.org/HOL/P?h=hein.journals/conrev8&i=203> accessed 5 October 2019

Turilli M and Floridi L, 'The Ethics of Information Transparency' (2009) 11(2) Ethics and Information Technology 105 <https://doi.org/10.1007/s10676-009-9187-9> accessed 5 October 2019

Turner J, 'Explaining the Nature of Power: A Three-Process Theory' (2005) 35(1) European Journal of Social Psychology 1 <https://doi.org/10.1002/ejsp.244> accessed 5 October 2019

Tutt A, 'An FDA for Algorithms' (2017) 69(1) Administrative Law Review 83 <http://dx.doi.org/10.2139/ssrn.2747994> accessed 5 October 2019

Tyler T, 'Procedural Justice and the Courts' (2004) 44 Court Review 26

—— and Lind A, 'A Relational Model of Authority in Groups' (1992) 25 Advances in Experimental Social Psychology 115 <https://doi.org/10.1016/S0065-2601(08)60283-X> accessed 5 October 2019

Uphoff N, 'Distinguishing Power, Authority & Legitimacy: Taking Max Weber at His Word by Using Resources-Exchange Analysis' (1989) 22(2) Polity 295 <https://www.jstor.org/stable/3234836> accessed 5 October 2019

Vallier K, 'In Defence of Intelligible Reasons in Public Justification' (2016) 66(264) The Philosophical Quarterly 596 <https://doi.org/10.1093/pq/pqv117> accessed 5 October 2019

Valsan R, 'Fides, Bona Fides, and Bonus Vir: Relations of Trust and Confidence in Roman Antiquity' (2017) 5 Journal of Law, Religion and State 48 <https://doi.org/10.1163/22124810-00501003> accessed 5 October 2019

Veale M, Binns R and Edwards L, 'Algorithms that Remember: Model Inversion Attacks and Data Protection Law' (2018) 376(2133) Philosophical Transactions of the Royal Society

A: Mathematical, Physical and Engineering Sciences 1 <http://doi.org/10.1098/rsta.2018.0083> accessed 5 October 2019

Vedder A and Naudts L, 'Accountability for the Use of Algorithms in a Big Data Environment' (2017) 31(2) International Review of Law, Computers & Technology 206 <https://doi.org/10.1080/13600869.2017.1298547> accessed 5 October 2019

Vestal A, 'Advancing the Search for Compromise: A Response to Professor Hynes' (1995) 58(2) Law and Contemporary Problems 55 <https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=4273&context=lcp> accessed 5 October 2019

Wachter S, 'The GDPR and the Internet of Things: A Three-Step Transparency Model' (2018) 10(2) Law, Innovation and Technology 266 <https://doi.org/10.1080/17579961.2018.1527479> accessed 5 October 2019

— — Mittelstadt B and Floridi L, 'Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation' (2017) 7(2) International Data Privacy Law 76 <https://doi.org/10.1093/idpl/ipx005> accessed 5 October 2019

Waelkens L, 'Réflexions sur la Bona Fides et la Mala Fides dans la Tradition du Droit Romain' (2018) 86(1-2) Revue d'Histoire du Droit 1 <https://brill.com/view/journals/lega/86/1-2/article-p1_4.xml> accessed 5 October 2019

Wagenknecht S, 'Facing the Incompleteness of Epistemic Trust: Managing Dependence in Scientific Practice' (2015) 29(2) Social Epistemology 160 <https://doi.org/10.1080/02691728.2013.794872> accessed 5 October 2019

Walsh D, Parisi J and Passerini K, 'Privacy as a Right or as a Commodity in the Online World: The Limits of Regulatory Reform and Self-Regulation' (2017) 17(2) Electronic Commerce Research 185 <https://doi.org/10.1007/s10660-015-9187-2> accessed 5 October 2019

Waldron J, 'Stare Decisis and the Rule of Law: A Layered Approach' (2012) 111 Michigan Law Review 1 <https://heinonline.org/HOL/P?h=hein.journals/mlr111&i=13> accessed 5 October 2019

Warburton J, 'Do Fiduciary Duties Matter?' (2011) 11(5) Corporate Governance 541 <https://doi.org/10.1108/14720701111176957> accessed 5 October 2019

Ward T, 'Expert Testimony, Law and Epistemic Authority' (2017) 34(2) Journal of Applied Epistemology 263 <https://doi.org/10.1111/japp.12213> accessed 5 October 2019

Watson JC, 'The Shoulders of Giants: A Case for Non-Veritism about Expert Authority' (2018) 37(1) Topoi 39 <https://doi.org/10.1007/s11245-016-9421-0> accessed 5 October 2019

Weiss EB, 'The Planetary Trust: Conservation and Intergenerational Equity' (1984) 11(4) Ecology Law Quarterly 495 <http://scholarship.law.georgetown.edu/facpub/334> accessed 5 October 2019

Wexler S, 'Discretion: The Unacknowledged Side of Law' (1975) 25 University of Toronto Law Journal 120 <https://heinonline.org/HOL/P?h=hein.journals/utlj25&i=124> accessed 5 October 2019

Wilcox L, 'Embodying Algorithmic War: Gender, Race, and the Posthuman in Drone Warfare' (2017) 48(1) Security Dialogue 11 <https://doi.org/10.1177/0967010616657947> accessed 5 October 2019

Williams D, 'Bias; The Judges and the Separation of Powers' (2000) 2000(1) Public Law 45

Winner L, 'Do Artifacts Have Politics?' (1980) 109(1) Daedalus 121

Wood MC, 'Advancing the Sovereign Trust of Government to Safeguard the Environment for Present and Future Generations (Part II): Instilling a Fiduciary Obligation in Governance' (2009) 39(1) Environmental Law 91 <https://heinonline.org/HOL/P?h=hein.journals/envlnw39&i=95> accessed 5 October 2019

Wormith S, 'Automated Offender Risk Assessment: The Next Generation or a Black Hole?' (2017) 16(1) Criminology & Public Policy 281 <https://onlinelibrary.wiley.com/doi/pdf/10.1111/1745-9133.12277> accessed 5 October 2019

Wright B, 'Power, Trust, and Science of Unitary Human Beings Influence Political Leadership: A Celebration of Barrett's Power Theory' (2010) 23(1) Nursing Science Quarterly 60 <https://doi.org/10.1177/0894318409353794> accessed 5 October 2019

Young S, 'Fiduciary Duties as a Helpful Guide to Ethical Decision-Making in Business' (2007) 74(1) Journal of Business Ethics 1 <https://www.jstor.org/stable/25075439> accessed 5 October 2019

Zedner L, 'Pre-Crime and Post-Criminology?' (2007) 11(2) Theoretical Criminology 261 <https://doi.org/10.1177/1362480607075851> accessed 5 October 2019

Žliobaitė I and Custers B, 'Using Sensitive Personal Data May Be Necessary for Avoiding Discrimination in Data-Driven Decision Models' (2016) 24(2) Artificial Intelligence and Law 183 <https://doi.org/10.1007/s10506-016-9182-5> accessed 5 October 2019

Zuboff S, 'Big Other: Surveillance Capitalism and the Prospects of an Information Civilization' (2015) 30 Journal of Information Technology 75 <https://doi.org/10.1057/jit.2015.5> accessed 5 October 2019

Contributions to Edited Books

Amir E, 'Reasoning and Decision Making' in K Frankish and W Ramsey (eds), *The Cambridge Handbook of Artificial Intelligence* (Cambridge University Press 2014) 191 <https://doi.org/10.1017/CBO9781139046855.013> accessed 5 October 2019

Anscombe GEM, 'On the Source of the Authority of the State' in J Raz (ed), *Authority* (New York University Press 1990) 142

Barrière F, 'The French Fiducie, or the Chaotic Awakening of a Sleeping Beauty' in L Smith (ed), *Re-Imagining the Trust* (Cambridge University Press 2012) 222

Bloice M and Holzinger A, 'A Tutorial on Machine Learning and Data Science Tools with Python' in A Holzinger (ed), *Machine Learning for Health Informatics: State-of-the-Art and Future Challenges* (Springer 2016) 435 <https://link.springer.com/book/10.1007%2F978-3-319-50478-0> accessed 5 October 2019

Bostrom N and Yudkowsky E, 'The Ethics of Artificial Intelligence' in K Frankish and W Ramsey (eds), *The Cambridge Handbook of Artificial Intelligence* (Cambridge University Press 2014) 316 <https://doi.org/10.1017/CBO9781139046855.020> accessed 5 October 2019

Burt R and Knez M, 'Trust and Third-Party Gossip' in R Kramer and T Tyler (eds), *Trust in Organizations: Frontiers of Theory and Research* (SAGE Publications 1996) 68

Criddle E, 'Protecting Human Rights During Emergencies: Delegation, Derogation, and Deference' in M Ambrus and R Wessel (eds), *Netherlands Yearbook of International Law 2014: Between Pragmatism and Predictability: Temporariness in International Law* (Asser Press 2015) 197 <https://scholarship.law.wm.edu/facpubs/1840/> accessed 5 October 2019

Filoramo G, 'Foundations of Power and Conflicts of Authority in Late-Antique Monasticism: An Introduction' in A Camplani and G Filoramo (eds), *Foundations of Power and Conflicts of Authority in Late-antique Monasticism* (Peeters Publishers 2007) 1

Fischer-Hübner S and others, 'Online Privacy – Towards Informational Self-Determination on the Internet' in M Hildebrandt, K O'Hara and M Waidner (eds), *Digital Enlightenment Yearbook 2013: The Value of Personal Data* (IOS Press 2013) 123

Fox-Decent E, 'New Frontiers in Public Fiduciary Law' in E Criddle, P Miller and R Sitkoff (eds), *The Oxford Handbook of Fiduciary Law* (Oxford University Press 2019) 909

Frankel T, 'Watering down Fiduciary Duties' in A Gold and P Miller (eds), *Philosophical Foundations of Fiduciary Law* (Oxford University Press 2014) 242

Gallanis T, 'The contribution of Fiduciary Law' in L Smith (ed), *The Worlds of the Trust* (Cambridge University Press 2013) 388 <https://doi.org/10.1017/CBO9781139505994> accessed 5 October 2019

Getzler J, 'Ascribing and Limiting Fiduciary Obligations' in A Gold and P Miller (eds), *Philosophical Foundations of Fiduciary Law* (Oxford University Press 2014) 39

Gold A, 'The Loyalties of Fiduciary Law' in A Gold and P Miller (eds), *Philosophical Foundations of Fiduciary Law* (Oxford University Press 2014) 176

Gürses S and Preneel B, 'Cryptology and Privacy in the Context of Big Data' in B (van der) Sloot, D Broeders and E Schrijvers (eds), *Exploring the Boundaries of Big Data* (WRR Amsterdam University Press 2016) 49

Havaei M and others, 'Deep Learning Trends for Focal Brain Pathology Segmentation in MRI' in A Holzinger (ed), *Machine Learning for Health Informatics: State-of-the-Art and Future Challenges* (Springer 2016) 125

Johnston D, 'Theory, Practice, and History: Rudiments' in D Johnston (ed), *The Roman Law of Trusts* (Oxford University Press 1988) 1

Kim SH, 'Fiduciary Law and Corruption' in E Criddle, P Miller and R Sitkoff (eds), *The Oxford Handbook of Fiduciary Law* (Oxford University Press 2019) 813

King G, 'Preface: Big Data Is Not About the Data!' in M Alvarez (ed), *Computational Social Science: Discovery and Prediction* (Cambridge University Press 2016)

Lewicki R and Bunker BB, 'Trust in Relationships: A Model of Trust and Development and Decline' in BB Bunker and J Rubin (eds), *Conflict, Cooperation, and Justice: Essays Inspired by the Work of Morton Deutsch* (Jossey-Bass 1995) 133

Miller P, 'The Fiduciary Relationship' in A Gold and P Miller (eds), *Philosophical Foundations of Fiduciary Law* (Oxford University Press 2014) 63

— — 'Dimensions of Fiduciary Loyalty' in G Smith and A Gold (eds), *Research Handbook on Fiduciary Law* (Edward Elgar Publishing 2018) 180 <https://doi.org/10.4337/9781784714833.00018> accessed 5 October 2019

Mishra A, 'Organizational Responses to Crisis: The Centrality of Trust' in R Kramer and T Tyler (eds), *Trust in Organizations: Frontiers of Theory and Research* (SAGE Publications 1996) 261

Mitchell R and Zoller K, 'Dynamic Presence rather than Command Presence: How Communicative Intelligence Influences Police/Citizen Interactions' in A Normore, M Javidi and L Long (eds), *Handbook of Research on Strategic Communication, Leadership, and Conflict Management in Modern Organizations* (IGI Global 2019) 255

Moore M, 'Purblind Justice: Normative Issues in the Use of Prediction in the Criminal Justice System' in National Research Council, *Criminal Careers and "Career Criminals"* (Vol 2, The National Academies Press 1986) 314

Offe C, 'How can we Trust our Fellow Citizens?' in M Warren (ed), *Democracy and Trust* (Cambridge University Press 1999) 42

Rotman L, 'Trust, Loyalty, and E-Commerce' in D Palmer (ed), *Ethical Issues in E-Business: Models and Frameworks* (IGI Global 2010) 58

Smith H, 'Why Fiduciary Law Is Equitable' in A Gold and P Miller (eds), *Philosophical Foundations of Fiduciary Law* (Oxford University Press 2014) 261

Smith L, 'Can We Be Obliged to Be Selfless?' in A Gold and P Miller (eds), *Philosophical Foundations of Fiduciary Law* (Oxford University Press 2014) 141

Snyder M and Kiviniemi M, 'Getting What They Came For: How Power Influences the Dynamics and Outcomes of Interpersonal Interaction' in A Lee-Chai and J Bargh (eds), *The Use and Abuse of Power: Multiple Perspectives on the Causes of Corruption* (Psychology Press 2001) 133

Sparrow R, 'Can Machines Be People? Reflections on the Turing Triage Test' in P Lin, K Abney and G Bekey (eds), *Robot Ethics: The Ethical and Social Implications of Robotics* (MIT Press 2012) 301

Straehle E, 'Thomas Hobbes and the Secularization of Authority' in A Tomaszewska and H Hämäläinen (eds), *The Sources of Secularism: Enlightenment and Beyond* (Palgrave Macmillan 2017) 101 <https://doi.org/10.1007/978-3-319-65394-5_6> accessed 5 October 2019

Vallor S, 'AI and the Automation of Wisdom' in T Powers (ed), *Philosophy and Computing: Essays in Epistemology, Philosophy of Mind, Logic, and Ethics* (Springer 2017) 161 <https://doi.org/10.1007/978-3-319-61043-6_8> accessed 5 October 2019

Webb C, 'The Philosophy of Fiduciary Law' in E Criddle, P Miller and R Sitkoff (eds), *The Oxford Handbook of Fiduciary Law* (Oxford University Press 2019) 687

Zarsky T, 'Transparency in Data Mining: From Theory to Practice' in B Custers and others (eds), *Discrimination and Privacy in the Information Society: Data Mining and Profiling in Large Databases* (Springer 2013) 301 <https://doi.org/10.1007/978-3-642-30487-3_17> accessed 5 October 2019

Conference Papers

Binns R and others, ''It's Reducing a Human Being to a Percentage': Perceptions of Justice in Algorithmic Decisions' (CHI'18, Canada, April 2018) <https://doi.org/10.1145/3173574.3173951> accessed 5 October 2019

Lim SY, Jarvenpaa S and Lanham H, 'Review of Research on Knowledge Transfer in Care Transitions: Trust-Enhancing Principles for Information Systems Design' (48th Hawaii International Conference on System Sciences, Kauai, January 2015) 3148 <https://ieeexplore.ieee.org/document/7070195> accessed 5 October 2019

Raufi B and others, 'Knowledgebase Harvesting for User-Adaptive Systems Through Focused Crawling and Semantic Web' (17th International Conference on Computer Systems and Technologies, Palermo, June 2016) 323 <https://dl.acm.org/citation.cfm?id=2983510> accessed 5 October 2019

Reports

Big Brother Watch, *Face off: The Lawless Growth of Facial Recognition in UK Policing* (Big Brother Watch 2018) <https://bigbrotherwatch.org.uk/wp-content/uploads/2018/05/Face-Off-final-digital-1.pdf> accessed 5 October 2019

Bonta J and Andrews DA, *Risk-Need-Responsivity Model for Offender Assessment and Rehabilitation* (Government of Canada 2007) <https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/rsk-nd-rspnsvty/rsk-nd-rspnsvty-eng.pdf> accessed 5 October 2019

Burgess P and others, *Ethics Advisory Group Report 2018: Towards a Digital Ethics* (EDPS Ethics Advisory Group, European Union 2018) <https://edps.europa.eu/sites/edp/files/publication/18-01-25_eag_report_en.pdf> accessed 5 October 2019

Mugnier E and others, *Resource Efficiency and Fiduciary Duties of Investors* (Final Report ENV.F.1/ETU/2014/0002 DG Environment, European Commission 2014) <http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/FiduciaryDuties.pdf> accessed 5 October 2019

National Academies of Sciences, Engineering, and Medicine, *Fostering Integrity in Research* (The National Academies Press 2017) <https://doi.org/10.17226/21896> accessed 5 October 2019

Robinson D and Koepke L, *Stuck in a Pattern: Early Evidence on "Predictive Policing" and Civil Rights* (Upturn 2016) <https://www.upturn.org/reports/2016/stuck-in-a-pattern/> accessed 5 October 2019

The Law Society Commission on the Use of Algorithms in the Justice System, *Algorithms in the Criminal Justice System* (The Law Society of England and Wales 2019) <https://www.lawsociety.org.uk/support-services/research-trends/algorithm-use-in-the-criminal-justice-system-report/> accessed 5 October 2019

UK Government Office for Science, *Artificial Intelligence: Opportunities and Implications for the Future of Decision Making* (Government Office for Science 2015) <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/566075/gs-16-19-artificial-intelligence-ai-report.pdf> accessed 5 October 2019

Dictionaries and Encyclopaedias

Hay D, *Words and Phrases Legally Defined, Volume 1* (4th edn, LexisNexis Butterworths 2007)

Schanbacher D, 'Fiducia', *Brill's New Pauly, Antiquity Volumes* (English edn, 2006) <http://dx.doi.org/10.1163/1574-9347_bnp_e411460> accessed 5 October 2019

Legislation and Case Law

Directive (EU) 2016/680 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHA [2016] OJ L119/89 (Data Protection Directive for Police and Criminal Justice Authorities)

R v Neil [2002] SCC 70 <https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/2012/index.do> accessed 5 October 2019

Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on

the free movement of such data, and repealing Directive 95/46/EC [2016] OJ L119/1 (General Data Protection Regulation)

Theses

Keymolen E, 'Trust on the Line: A Philosophical Exploration of Trust in the Networked Era' (Doctor Thesis, Erasmus University Rotterdam 2016) <https://repub.eur.nl/pub/93210> accessed 5 October 2019

Working Papers

Harcourt B, 'Against Prediction: Sentencing, Policing, and Punishing in an Actuarial Age' (2005) University of Chicago Public Law & Legal Theory Working Paper 94/2005 <https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1021&context=public_law_and_legal_theory> accessed 5 October 2019

Hovell D, 'On Trust: The UN as Fiduciary (A Reply to Rosa Freedman)' (2018) LSE Law, Society and Economy Working Paper 13/2018 <http://dx.doi.org/10.2139/ssrn.3204151> accessed 5 October 2019

Tamanaha B, 'A Concise Guide to the Rule of Law' (2007) St John's Legal Studies Research Paper 82/2007, 13-14 <http://ssrn.com/abstract=1012051> accessed 5 October 2019

Interviews

Schamus J, Interview with Cathy O'Neil (Filmmaker Magazine, 14 September 2017) 066 <https://filmmakermagazine.com/103281-rise-of-the-machines/#.W8bMQmgzZEY> accessed 5 October 2019

Other Online Sources

European Court of Human Rights, 'Guide on Article 6 of the European Convention on Human Rights: Right to a Fair Trial (Criminal Limb)' (Council of Europe/European Court of Human Rights 2019) <https://www.echr.coe.int/Documents/Guide_Art_6_criminal_ENG.pdf> accessed 5 October 2019

Information Commissioner's Office, 'Big Data, Artificial Intelligence, Machine Learning and Data Protection' (Version: 2.2, ICO 2017) <https://ico.org.uk/media/for-organisations/documents/2013559/big-data-ai-ml-and-data-protection.pdf> accessed 5 October 2019