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Algorithms and the Rule of Law

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The increasing prevalence of software in decision-making processes raises very important and urgent questions regarding how society protects fundamental and basic values, such as equality, fairness and the rule of law. Consider for a moment three recent examples of the application of machine learning that may alter the balance of power in relationships between private individuals and landlords, and criminal defendants and the state.

First, the recently launched "Tenant Assured" service, which is at https://www.tenantassured.com. This enables landlords to vet potential tenants in advance by scraping information from various social networks, build a picture of their personality and financial situation, and provide an overall score.[1] The privacy implications are obvious, but these are not the most interesting issues. The profile for a prospective tenant is assembled by algorithms drawing conclusions from data from a variety of sources. The Tenant Assured website claims "If an applicant is using a lot of negative words and regularly argumentative online, then he/she will likely have a negative online reputation. And vice versa." Leaving aside the question of whether this is a legitimate processing of personal data, a valid conclusion, or a relevant consideration in deciding whether to rent a property, consider the number of subjective choices implicit in that statement, and how these must be converted to some quantitative measure. What is a negative word? What are a lot of them? What is regular? Programmers will have made decisions about all of these factors, which will be embedded in difficult-to-change software code, which is not available to the public to challenge or correct. Instead individuals are told that they can't rent a particular apartment because their online score is not high enough. This happens for reasons that cannot be adequately explained to them because the code is secret and probably difficult to understand, especially by a non-programmer.

Second, several jurisdictions in the United States of America are relying on computer systems to predict outcomes for criminal suspects and defendants.[2] These are used to identify individuals who are likely to commit crime and locations where they are likely to do so, by judges to assist in determining sentences, and by prison officials in deciding how to manage particular

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[1] Emma Whitford, 'With 'Tenant Assured,' Landlords Have An EZ Way To Sift Through Your Entire Online Profile' (*The Gothamist*, 10 June 2016) <gothamist.com/2016/06/10/such_a_glorious_future_now.php> accessed 8 July 2016.

[2] Nicholas Diakopoulos, 'We need to know the algorithms the government uses to make important decisions about us' (*The Conversation*, 24 May 2016) <theconversation.com/we-need-to-know-the-algorithms-the-government-uses-to-make-important-decisions-about-us-57869> accessed 8 July 2016.

prisoners. Eric L Loomis has challenged the use of the Compas algorithm developed by Northpointe Inc, as part of his sentencing.[3] The Wisconsin Supreme Court has allowed continued use of this system but has highlighted that it is only one factor to be considered when passing sentence.[4] On a more positive note, a pilot project in New York City using big data and machine learning proved more accurate than judges at predicting which defendants were likely to offend if released on bail, while not considering their race, a development which is likely to lead to a re-balancing of the prison population.[5]

Finally, a teenage Stanford University student, Joshua Browder, has developed a chatbot-based expert system which assists with challenges to parking tickets. Tens of thousands of tickets have been overturned with its help,[6] and he has expanded the system to assist with applications for refugee status.[7]

Digital information and communications technology, particularly big data, machine learning tools, and networked devices, have been enthusiastically adopted by individuals and businesses, altering the texture of commercial and social relationships in profound ways. It is clear that these new tools are becoming a very important part of modern society and a significant factor to consider when developing political or business strategies, developing new markets, or trying to solve problems. All of these changes have raised many legal questions, and issues around data protection, deregulation and automation of public transport, and copyright infringement have become headline news. What has received less attention until quite recently is the use of these technologies by the state.

This was not so obviously relevant to the individual or socially significant. There seems to be little attention paid to how this use may impact on fundamental legal values. The Snowden revelations changed that with regard to mass surveillance. However, many other aspects of government use of information technology go un-explored. Large public databases, obscure software systems, and creaky user interfaces are not interesting to the average citizen or the journalists whose role it is to inform them of what matters.

There is a great deal more to the wide scale adoption of digital technology than meets the eye, particularly in the hidden corners of the modern state. This is slowly becoming better understood by professionals and the general public. In very recent years, stories have emerged that highlight the key role that algorithms (which are, at their heart, processes of selection) play in shaping the

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[3] Megan Garber, 'When Algorithms Take the Stand' *The Atlantic* (30 June 2016).
[4] *Wisconsin v Loomis* 2016 WI 68.
[5] Tom Simonite, 'How to Upgrade Judges with Machine Learning' *MIT Technology Review* (6 March 2017).
[6] Samuel Gibbs, 'Chatbot lawyer overturns 160,000 parking tickets in London and New York' *The Guardian* (London, 28 June 2016).
[7] Jon Fingas, 'Parking ticket chat bot now helps refugees claim asylum' (*Engadget*, 6 March 2017) <www.engadget.com/2017/03/06/parking-ticket-chat-bot-now-helps-refugees-claim-asylum/> accessed 6 March 2017.

world around us. Google Image Search has displayed racial and gender biases –
labeling pictures of black people as 'gorillas',[8] selecting mug shots when asked to
show "three black teenagers" but selecting happier images when asked to show
"three white teenagers",[9] and under-representing women in searches for career-
related keywords.[10] Facebook has been accused of manipulating the news stories
which are highlighted in individuals' feeds.[11] Volkswagen has admitted installing
software in its diesel cars that cheat on emissions tests, something which has led
to prosecutions for executives and fines of $4.3 billion.[12] Other car
manufacturers are accused of using similar 'defeat devices'.[13]

If this is occurring in the public sector, what biases, errors and assumptions are
causing difficulties for individual citizens? We still know very little about how
government uses these technologies and what may go wrong. Software is now a
key component in a great deal of the machinery of government – for example,
social welfare, the tax system, environmental management and regulation – and
is increasingly playing a role in policing and warfare through profiling of
criminal and terrorist suspect, the use of drones, and the deployment of
autonomous weapons systems. The issues that are buried in these systems
should be a matter of serious concern for law and lawyers as we try to protect
fundamental values in the 21st century, and we try to properly represent our
clients' interests against systems errors that we cannot easily identify.

How are individuals selected for tax audit? Why are they denied social welfare
benefits? Why are they investigated by the police? Often, this will be because of
outputs from software programs, sometimes machine learning systems that sift
through masses of "big data". As Danielle Keats Citron has discussed in her
writings,[14] this development – the taking of decisions about individual rights and
entitlements based on unknown, inscrutable, and often unchallengeable systems
– raises serious challenges to the rule of law in the modern state. Similarly, as
private sector systems become the conduits for our daily lives, how many

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[8] Jana Kasperkevic, 'Google says sorry for racist auto-tag in photo app' *The
Guardian* (1 July 2015).
[9] Elle Hunt, '"Three black teenagers": anger as Google image search shows police
mugshots' *The Guardian* (9 June 2016).
[10] Emily Cohn, 'Google Image Search Has A Gender Bias Problem' (*The Huffington
Post*, 21 April 2015) <www.huffingtonpost.com/2015/04/10/google-image-
gender-bias_n_7036414.html> accessed 8 July 2016
[11] Michael Nunez, 'Former Facebook Workers: We Routinely Suppressed
Conservative News' (*Gizmodo*, 9 May 2016) <gizmodo.com/former-facebook-
workers-we-routinely-suppressed-conser-1775461006> accessed 8 July 2016.
[12] Megan Geuss, 'DOJ indicts 6 Volkswagen executives, automaker will pay $4.3
billion in plea deal' (*Ars Technica*, 11 January 2017)
<arstechnica.com/cars/2017/01/vw-group-likely-to-pay-4-3b-plead-guilty-to-
criminal-charges-in-diesel-scandal/> accessed 6 March 2017.
[13] Hiroko Tabuchi, 'E.P.A. Accuses Fiat Chrysler of Secretly Violating Emissions
Standards' *New York Times* (13 January 2017).
[14] Danielle Keats Citron, 'Technological Due Process' (2008) 85 Washington
University Law Review 1249.

individuals are side-lined because of unfair factors? (For example, Google advertising seems to have a gender bias; it generally will not show executive jobs to women.[15])

The impact of error in these processes can often arise from mundane causes and affect a small number of people, rather than arising from the large-scale application of the current buzzwords of 'big data' and 'algorithms', but the impact on individual lives can nonetheless be significant. For example, easy-to-anticipate problems in transitioning from one computerised case management system to another in Alameda County, California led to dozens being arrested or jailed in error, with others being forced to register as sex offenders when they should not have done so.[16] Big data can, of course, produce problems on a much larger scale – the Australian Centrelink social welfare compliance system has required many thousands of citizens to needlessly prove that they were properly in receipt of benefits because it generated far too many false positives.[17] Overall, it is clear that the use of databases, algorithms, and big data by government and bureaucracy has the potential to go seriously awry, with significant negative consequences for individuals and populations.

These problems should not be over-stated. We are not (yet) in a dystopia of computer control, where one's fate is entirely pre-determined by unchallengeable calculations. Digital technology also offers opportunities for transparency and empowerment, and properly designed systems may (as noted above) help to overcome bias and prejudice. Humans are still very much part of the loop in decision-making. There remains significant opportunity to influence and manage the development of computer technology, to ensure that ethics and law are part of the curriculum of software developers and analysts, and to regulate as necessary. However, the development of big data, computer-assisted decision-making, and e-regulation present serious challenges to the rule of law, equality, and natural justice, and the poor understanding and transparency of software development means that this requires serious attention from those to who research, teach, and practice law.

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[15] Julia Carpenter, 'Google's algorithm shows prestigious job ads to men, but not to women. Here's why that should worry you' *The Washington Post* (6 July 2015).
[16] Cyrus Farivar, 'Lawyers: New court software is so awful it's getting people wrongly arrested' (*Ars Technica*, 12 January 2016) <arstechnica.com/tech-policy/2016/12/court-software-glitches-result-in-erroneous-arrests-defense-lawyers-say/> accessed 6 March 2017.
[17] Christopher Knaus, 'Centrelink debt notices based on 'idiotic' faith in big data, IT expert says' *The Guardian* (29 December 2016).