AI-Supported Adjudicators: Should Artificial Intelligence have a Role in Tribunal Adjudication?

By Jesse Beatson[1]

Currently, artificial intelligence (AI) assists and automates decisions in a wide variety of contexts, including legal ones. A novel topic is how recent developments in AI might be leveraged to assist in public tribunals. Tribunals are fertile grounds for the uptake of AI programs for they lack the rigid procedure of courts and aim to facilitate the efficient resolution of disputes. This paper explores the merits and risks of tribunals adopting the model of "AI-Supported Adjudication" (ASA). Specifically, I propose that statutory authorization be given for AI decision support tools which provide relevant information to adjudicators but stop short of making outcome recommendations. The structure of this paper is as follows: (1) preliminary discussion regarding definitions, uses of AI in the legal sector, and desirability of tribunal AI, (2) illustrative use cases, (3) potential risks and implementation challenges of ASA, and (4) recommendations for development, implementation, and regulation.

Introduction

The growing capabilities of artificial intelligence (AI) technology provokes many questions for the legal sector.[2] AI has been defined as a "suite of related technologies" powered by algorithms that can perform tasks otherwise requiring human intelligence.[3] To date the private sector has seen the greatest uptake of AI, but one of the early public uses of AI has been in the realms of judicial and administrative decision-making. There are two primary types of AI currently used in these contexts – (1) explicitly coded, closed-rule algorithms ("legal expert

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[2] An academic field, "AI and Law", is on the "cusp of a revolution". See Kevin D. Ashley, *Artificial intelligence and legal analytics: new tools for law practice in the digital age*. Cambridge University Press, 2017.

[3] "Responsible Artificial Intelligence in the Government of Canada" (2018) Treasury Board Secretariat of Canada, White Paper, online:<https://buyandsell.gc.ca/cds/public/2018/06/28/05baa93c08b6f2d3000855170f831066/ABES.PROD.PW__EE.B017.E33657.EBSU000.PDF>.https://buyandsell.gc.ca/cds/public/2018/06/28/05baa93c08b6f2d3000855170f831066/ABES.PROD.PW__EE.B017.E33657.EBSU000.PDF>; David Schatsky, Craig Muraskin, and Ragu Gurumurthy. "Demystifying artificial intelligence: What business leaders need to know about cognitive technologies" (2014), online: < https://www2.deloitte.com/insights/us/en/focus/cognitive-technologies/what-is-cognitive-technology.html>.

systems"), and (2) trained, machine-learning (ML) algorithms ("predictive analytics").[4] There is also a continuum in the extent to which AI is getting involved in decision-making (from support to judges to full automation, for instance of welfare eligibility processing by government agencies).[5] Uses of AI in the public realm are currently all outside of Canada, but perhaps not for long. The future of administrative regulation and adjudication in Canada will likely feature AI in a prominent role. In June 2018, for instance, there were "invitations to bid" and "requests for information" from federal entities in Canada looking for AI solutions to integrate into the work of the Department of Justice (DOJ), Immigration, Refugees and Citizenship Canada (IRCC), and others.[6]

A novel topic is how recent developments in AI might be leveraged to assist tribunal adjudicators.[7] Generally, administrative tribunals have not received much scholarly attention despite their importance in the determination of many individuals' legal rights.[8] This has been true of the recent scholarship on AI's growing impact in the legal sector as well.[9] This paper explores the merits and risks of tribunals adopting what I am calling "AI-Supported

[4] The definition of AI is evolving and is not universal. Some might consider "legal expert systems" to be lesser AI. For the purposes of this paper, I will accept the broader definition while recognizing that "predictive analytics" often involves more technical complexity.

[5] For supportive tool see "State v. Loomis: Wisconsin Supreme Court Requires Warning Before Use of Algorithmic Risk Assessments in Sentencing" (2017) 130 *Harvard Law Review* 1530, online: <https://harvardlawreview.org/2017/03/state-v-loomis/**>;** for full automation see Robert N. Charette, "Michigan's MiDAS Unemployment System: Algorithm Alchemy Created Lead, Not Gold" (January 2018), online: < https://spectrum.ieee.org/riskfactor/computing/software/michigans-midas-unemployment-system-algorithm-alchemy-that-created-lead-not-gold>.

[6] Treasury Board Secretariat of Canada, 2018, "RFI for AI Services", online: https://buyandsell.gc.ca/cds/public/2018/06/28/05baa93c08b6f2d3000855170f831066/ABES.PROD.PW__EE.B017.E33657.EBSU000.PDF>; Public Works and Government Services Canada, 2018, "Artificial Intelligence Solutions", online: <https://buyandsell.gc.ca/procurement-data/tender-notice/PW-EE-017-33462>.

[7] There is very little scholarship on this specific topic, but there is burgeoning interest. The Canadian Council of Administrative Tribunal's (CCAT) 34th Annual Symposium held in June 2018 featured a panel titled "Artificial Intelligence (AI) and the Law: Self-Driving Tribunals".

[8] Peter Cane, Administrative Tribunals and Adjudication.

[9] Notable exceptions, but outside of Canada- Cyber delegation, and Adjudication by Algorithm Regulation by Robot.

Adjudication" (ASA). Specifically, I am proposing a model where statutory authorization is given for AI decision support tools which provide relevant information to adjudicators but stop short of making outcome recommendations. Either legal expert systems, predictive analytics, or some combination thereof would be used depending on the needs of any given tribunal. I will begin by offering preliminary discussion regarding definitions, current and future uses of AI in the legal sector, and the desirability of tribunal AI. Subsequently, I turn to concrete case studies for further illustration. Next, I canvas some potential risks and implementation challenges of ASA pertaining to (1) lawful delegation, (2) procedural fairness, and (3) judicial review. Finally, although critical skepticism about the use of tribunal AI is warranted, I offer concluding thoughts in terms of optimal development and regulatory frameworks. Ultimately, I argue for the expansion of AI into tribunal adjudication, albeit within the limits defined by ASA.

Definitions and the Omnipresence of AI in Society

Two types of AI

Understanding the role AI could come to play in public tribunals requires some knowledge of the technology in question. AI is an algorithmic technology, and an algorithm is a sequence of instructions telling a computer or digital device what to do.[10] While this definition covers a wide terrain, two main types of AI used in the legal sphere can be distinguished: (1) "legal expert systems", and (2) "predictive analytics", a short form I am using to describe AI programs developed through machine learning (ML) algorithms. The former run on explicitly coded, closed rule algorithms. In other words, these algorithms are based on a set of finite and

[10] Pedro Domingos, *The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake Our World* (Basic Books, 2015); for an alternate definition, see Dag Wiese Schartum, "From Algorithmic Law to Automation-friendly Legislation", (August 2016), online: < https://www.scl.org/articles/3716-from-algorithmic-law-to-automation-friendly-legislation>.

pre-programmed rules which can then be applied to new information to solve complex problems and draw conclusions. The construction of legal expert systems typically involves a consultation phase with subject matter experts, the results of which are then input into the AI program.[11] Legal expert systems can function as "automated decision trees", directing decision-makers in ways that "could be replicated manually but at greater time and expense".[12] An example is the programs some of Australia's administrative decision-makers use that provide guidance on the applicability and content of relevant legislation, policy, and case law.[13]

By contrast, predictive analytics programs run on trained, machine learning (ML) algorithms. They require access to a lot of data ("Big Data") to operate.[14] While the work of legal expert systems could be replicated (or close to replicated) manually, the work done by ML algorithms is computationally intensive in a way that exceeds the analytic capabilities of humans.[15] It is a clear example of how "in our digitized present, automation is increasingly

[11] Richard Susskind, "Expert Systems in Law and the Data Protection Adviser" (1987) 7:1 *Oxford Journal of Legal Studies* (1987) at 145.

[12] Email from Lorne Sossin (1 December 2017). Also, a very simple example of a decision tree is the Drive Clean test from Service Ontario, which moves through a series of binary "yes or no" type questions to determine if the driver's car produces a level of emissions suitable for the road. See "Drive Clean Test", online: <https://www.ontario.ca/page/drive-clean-test>.

[13] Australia, Administrative Review Council, *Automated Assistance in Administrative Decision Making*, Report no. 46 (November 2004), online:<https://www.arc.ag.gov.au/Documents/AAADMreportPDF.pdf> at 5.

[14] Along these lines it has been argued that legal data repositories in like CanLII and SOQUIJ may not be voluminous enough to fully empower a predictive AI tool that relies on reported decisions. This problem might be of special concern in the tribunal context, where indexing of past cases is more limited given the lack of a firm *stare decisis* principle. For discussion of the general problem of data shortage, see Omar Ha-Redeye, "The Big Data Problem for AI in Law" (2016), online: < http://www.slaw.ca/2016/09/11/the-big-data-problem-for-ai-in-law/>. Another issue explored elsewhere is how access to this data raises privacy, and in the private sphere, competition concerns. See the Competition Bureau's consultation paper, "Big data and Innovation: Implications for competition policy in Canada" (2017): online<http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04304.html. See also the Federal Court of Appeal in its decision regarding "data monopolies" in *Toronto Real Estate Board v. Commissioner of Competition*, 2017 FCA 236.

[15] Dave Gershgorn, "AI is now so complex its creators can't trust why it makes decisions" (December 2017), Quartz, online: <https://qz.com/1146753/ai-is-now-so-complex-its-creators-cant-trust-why-it-makes-decisions/>.

moving from the hand to the brain."[16] The human cognitive limitations ML has been particularly adept at overcoming include "consistency and speed of decision making" as well as "understanding risk".[17] An important trait of ML algorithms is that rather than process a stable set of instructions repeatedly, they typically exhibit "self-learning", rewriting themselves as they run.[18] The potential of ML algorithms is captivating much of the public attention around AI. They power "smart" consumer products like "self-driving" cars and personal assistants such as Amazon's Alexa and Apple's Siri. Self-learning introduces a measure of unpredictability. While ironic that the technologies we use to predict are somewhat unpredictable themselves, the popular view that this amounts to a kind of machine sentience run amok is overblown and often fear-mongering. Although machine learning algorithms are capable of independently operating and adapting, Chris Cox, one of the original architects of Facebook's news feed, has underscored that humans have a continued role to play in correcting for errors and unintended consequences.[19]

AI in Society

AI is no longer in the realm of speculative fiction or arcane theory, but now has a range of everyday and legal applications. The uptake of AI in private and public spheres is part of why the present era has been called the "fourth industrial revolution".[20] Beyond "smart" consumer products, AI is augmenting human decision-making in a wide range of domains by, for example,

[16] Brian d'Alessandro, Cathy O'Neil, and Tom LaGatta, "Conscientious Classification: A Data Scientist's Guide to Discrimination-Aware Classification" (2017) 5:2 *Big data* at 120.
[17] *Ibid.*
[18] Another variety of ML algorithm "learn" from a data set and then do not adapt to additional input.
[19] Jacob Brogan, "Your Algorithms Cheat Sheet" (February, 2016), Slate online: < http://www.slate.com/articles/technology/future_tense/2016/02/algorithms_101_a_cheat_sheet_to_the_terminology_the_ethical_debates_and.html>.
[20] Klaus Schwab, *The fourth industrial revolution*. (Crown Business, 2017).

(1) determining who gets benefits like bank loans, credit cards, and welfare,[21] (2) assessing people as potential tenants and employees,[22] (3) selecting neighbourhoods for heightened police surveillance,[23] and (4) evaluating the recidivism risk of criminal defendants.[24] This broad uptake of AI to assist individual and institutional decision-making is not surprising, given that advances in computational power and sophistication mean that "the set of tasks and activities in which humans are strictly superior to computers is becoming vanishingly small".[25] The growing potential of AI – particularly ML algorithms – can be attributed to the wide availability of graphics processing units (accelerating processing speeds), vastly increased storage space, and a massive supply of data. This confluence of new developments has improved the capacity of ML algorithms for rapidly digesting vast quantities of information and discovering and analyzing complex patterns. The heightened capability of AI means commercialization and government buy-in, and these factors in turn will result in wide societal impact.

Public tribunals will not remain isolated from these changes. Nevertheless, it is important to highlight how public-sector reliance on algorithmic decision support tools or automation programs raises larger questions than private sector equivalents, simply because "society

[21] For welfare, see Virginia Eubanks' description of how the Australian government created an algorithmic system to analyze the financial records of people receiving means-tested benefits. The algorithm was introduced alongside a government announcement of a new target to claw back $4.5 billion from benefits recipients. The result was what has been called the "robo-debt" scandal. See Virginia Eubanks, *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor* (St. Martin's Press, 2018).

[22] See Naborly tenant screening, online: < https://naborly.com/>

[23] See Matt Meuse, "Vancouver police now using machine learning to prevent property crime", *CBC News* (22 July 2017), online: < http://www.cbc.ca/news/canada/british-columbia/vancouver-predictive-policing-1.4217111>; in the United States, the ACLU has vocally opposed predictive policing, claiming it deepens problems of racial biases and lack of transparency in policing activities. See "Statement of Concern About Predictive Policing by ACLU and 16 Civil Rights Privacy, Racial Justice, and Technology Organizations", online: < https://www.aclu.org/other/statement-concern-about-predictive-policing-aclu-and-16-civil-rights-privacy-racial-justice>.

[24] See Northpointe Inc.'s COMPAS risk scores, online: http://www.northpointeinc.com/files/downloads/FAQ_Document.pdf>; State v Loomis, *supra* note 5.

[25] See Benjamin Alarie, Anthony Niblett, & Albert Yoon, "Law in the future" (2016) 66:4 *University of Toronto Law Journal* at 423.

regulates public power differently than the way it is regulated the private sector".[26] In other words, it remains vital to retain distinctions between the private/commercial and the public/politico-legal.

Environmental Scan: Applications of AI in Legal Decision-Making

Public tribunals have been classified by many as a fourth branch of government, differentiated from the legislature, executive, and judiciary.[27] Accordingly, tribunal adjudicators are susceptible to an identity crisis about whether their work is more properly within the "governance" or the "justice" sector.[28] To be thorough I conducted an environmental scan of how AI is being used – and how it could soon be used – by courts, administrative tribunals, and government agencies (in other words, in "legal decision-making"). This chart and brief literature review that accompanies it are meant to provide context to readers about recent developments in the use of AI in the public sector in ways consequential for people's rights. Such knowledge of the algorithmic environment will help situate my argument for AI-Supported Adjudication (ASA), as well as, I hope, demonstrate the significance and urgency of this topic.

[26] See Executive Office of the President, "Big Data: Seizing Opportunities, Preserving Values" (2015), online: < https://obamawhitehouse.archives.gov/sites/default/files/docs/20150204_Big_Data_Seizing_Opportunities_Preserving_Values_Memo.pdf> ("Public trust is required for the proper functioning of government, and governments must be held to a higher standard for the collection and use of personal data than private actors.").

[27] See *Ocean Port Hotel Ltd. v. British Columbia (General Manager, Liquor Control and Licensing Branch),* [2001] 2 S.C.R. 781, 2001 SCC 52*;* also, France Houle, "Constructing the Fourth Branch of Government for Administrative Tribunals" (2007) 37 Supreme Court Law Review 1; and Lorne Sossin, "The Ambivalence of Administrative Justice in Canada: Does Canada Need a Fourth Branch?" in *Lamer: The Sacred Fire,* Daniel Jutras and Adam Dodek (eds.) (2009) 46 Supreme Court Law Review 51.

[28] For example, Phillip Bryden asks if tribunal reform is "justice reform" or "governance reform", and whether the answer to this question impacts what level of independence ought to be afforded to tribunal members. See Michael Gottheil, "Opening Plenary: Administrative Governance Reform versus Administrative Justice Reform", online: <https://soar.on.ca/system/files/documents/opening.pdf>.

Taxonomy and Applications of AI in Legal Decision-Making

		Extent of Automation	
Type	**Context**	**Partial (AI-Supported Systems)**	**Full (Automated Decision Systems)**
Adjudication AI Used to make or support determinations about individuals' rights. (Goals: efficiency, effectiveness, consistency)	**Court**	***Current Use*** Risk Scores for Criminal Courts COMPAS algorithm by Northpointe used in the U.S.[29] Pension Eligibility Guidance EXPERTIUS, a decision-support system that advices Mexican judges of whether a plaintiff is eligible for a pension, and in what amount.[30] Small Claims Northern Ireland Courts and Tribunal Service, Small Claims Online[31]	***Current Use*** NONE ***Future Use*** Robo-judges?
	Tribunal	***Current Use*** NONE ***Future Use*** ***AI-Supported Adjudication (ASA)?*** [32]	***Current Use*** NONE ***Future Use*** "Self-Driving Tribunals"?[33]
	Ministry/ Agency	***Current Use*** UNKNOWN ***Future Use*** Litigation outcome analytics See June 2018 invitations to bid for Immigration, Refugees, and Citizenship Canada (IRCC), Employment and Social Development Canada (ESDC), and Department of Justice (DOJ).[34] Frontend immigration decision-making In Canada, Humanitarian and Compassionate (H&C) consideration as well as Pre-Removal Risk Assessment (PRRA) applications?[35]	***Current Use?*** Welfare eligibility analysis In Australia, the Department of Human Service (Centrelink) (known colloquially as "Robo-debt") and in Michigan, a similar system called MiDAS.[36] ***Future Use*** Other automated systems utilized by federal agencies See Treasury Board RFI[37]

[29] Northpointe, *supra* note 24.

[30] See E Casares, "EXPERTIUS: A Mexican Judicial Decision-Support System in the Field of Family Law" (Proceedings of the 21st International Conference on Legal Knowledge and Information Systems, JURIX, 2008).

[31] See Northern Ireland Courts and Tribunals Service, Small Claims Online: A Users Guide, online: < https://www.justice-ni.gov.uk/sites/default/files/publications/justice/Small%20Claims%20Online%20User%20Guide.pdf>.

[32] The focus of this paper.

[33] CCAT, *supra* note 7.

[34] Public Works and Government Services Canada, *supra* note 6.

[35] *Ibid.*

[36] For Centrelink, see Terry Carney, "The New Digital Future for Welfare: Debts Without Legal Proofs or Moral Authority?" (2018), UNSW Law Journal Forum 1-16; also see Paul Karp and Christopher Knaus, "Centrelink robo-debt program accused on enforcing 'illegal' debts (April 2018), The Guardian, online: <https://www.theguardian.com/australia-news/2018/apr/04/centrelink-robo-debt-program-accused-of-enforcing-illegal-debts>. For MiDAS, *supra* note 5.

[37] Treasury Board, *supra* note 6.

Litigation AI Used to better prepare parties to a legal dispute by offering intelligent research solutions, automated filing, and/or predictions about a matter's probable resolution. Goal: access to justice	**Court**	***Current Use*** Litigation outcome analytics Lex Machina by LexisNexus Legal, Premonition, Blue J Legal for Tax Court and employment disputes.[38] Also, program used by Aletras et al. (2016) to predict outcomes of cases before the European Court of Human Rights (ECtHR)[39] ***Future Use*** UNKNOWN	***Current Use*** "Robo-lawyers" DoNotPay,[40] an app developed to fight parking tickets for users. The app generates an appeal letter that the user simply signs and prints. E-discovery Exterro and Relativity ***Future Use*** Robo-law firms?
	Tribunal	***Current Use*** UNKNOWN	***Current Use*** NONE
Mediation AI Used by parties to a legal dispute to see if their conflict can be streamlined and resolved early using online and/or predictive analytical tools. Goal: access to justice	**Online** (outside of traditional legal dispute resolution forums)	***Current Use*** Online Dispute Resolution (ODR) Rechtwijzer 2.0, Dutch online dispute resolution (ODR) platform[41] Canadian examples of ODR: British Columbia Civil Resolution Tribunal and Quebec's PARLe pilot project[42] Divorce application Online divorce assistant (currently in beta form), available in British Columbia, and for now only for Joint Divorce with no children.[43] ***Future Use*** ODR but with the addition of a predictive analytics function built into the platform?	***Current Use*** NONE ***Future Use*** ODR but without the involvement of human mediators?

Extent of Automation

Governments are increasingly looking to utilize Automated Decision Systems (sometimes called "Robo-adjudication") to gain efficiencies in the administrative state.[44] As noted by Perry, "although people may express shock at the idea of software making decisions about rights issues, it is already happening. Many first line administrative decisions affecting

[38] LawGeex, *infra* note 61.

[39] Nikolaos Aletras, Dimitrios Tsarapatsanis, Daniel Preoţiuc-Pietro, and Vasileios Lampos, "Predicting judicial decisions of the European Court of Human Rights: A natural language processing perspective" (2016) 2 *PeerJ Computer Science* at 93.

[40] Shannon Liao, "World's first robot lawyer now available in all 50 states" (July 2017), The Verge, online: <https://www.theverge.com/2017/7/12/15960080/chatbot-ai-legal-donotpay-us-uk>.

[41] See Rechtwijzer, "Problem or conflict?" online: <https://rechtwijzer.nl/>.

[42] For BCCRT, "Welcome to the Civil Resolution Tribunal", online:< https://civilresolutionbc.ca/>; for PARLe see Karim Benyekhlef and Nicolas Vermeys, "Publicly Funded Consumer ODR is Now a Reality in Quebec" (February 2017), Slaw, online: < http://www.slaw.ca/2017/02/10/publicly-funded-consumer-odr-is-now-a-reality-in-quebec/>.

[43] "B.C. launches online divorce tool offering step-by-step guide to sever the knot" (July 2018), CBC, online:< https://www.cbc.ca/news/canada/british-columbia/bc-launches-online-tool-for-couples-seeking-divorce-1.4742887>.

[44] For instance Treasury Board, *supra* note 3.

rights are made by machines or via computer processing."[45] These systems work by testing inputs against rules, such as "legislative or regulatory requirements".[46] In the case of welfare eligibility analysis, automation allows this to be processed outside of working hours and for more complex or unexpected applications to be triaged to human investigators.[47] Examples of these systems include Michigan's MiDAS, and Australia's Centrelink systems.[48]

Automated Decision Systems have been controversial, and there are strong arguments that some types of decisions should always require some form of intervention because of, for example, their importance and impact on those subject to the decision.[49] Full automation will likely never be appropriate for courts or tribunals and thus automated tribunal decision-making, a quantum leap from the status quo, will not be explored in this paper. Rather, this paper focuses on the potential and current realities of AI decision support tools.

A complication is that this dichotomy between full and partial automation possibly hides what is actually a "grey zone". AI has a demonstrably powerful influence on human judgment and human decision-makers in many domains tend not to disobey algorithmic recommendations.[50] This influence would likely affect tribunal decision-makers, owing to a combination of psychological tendencies (e.g. "automation bias" and "anchoring") as well as specific external pressures like the need to save time and resources in resolving high-volume

[45] Justice Melissa Perry, "Idecide: Administrative Decision-Making In The Digital World" (2017) 91 ALJ at 29.
[46] *Ibid.*
[47] Ibid, at 16.
[48] MiDAS *supra* note 5; Centrelink *supra* note 35.
[49] *Ibid.* Also see U.S. court case pertaining to a law suit against MiDAS that ended in a settlement, Cahoo et al v. SAS Analytics Inc. et al, No. 2:2017 17-10657.
[50] Angèle Christin, Alex Rosenblat, & Danah Boyd, "Courts and Predictive Algorithms" (27 October 2015), online: < http://www.law.nyu.edu/sites/default/files/upload_documents/Angele%20Christin.pdf>.

caseloads.[51] "Automation bias" (also referred to as "automation-induced complacency") can be defined as "the tendency to use automated cues as a heuristic replacement for vigilant information seeking processing".[52] A related bias called "anchoring" describes how even if a human departs from a program's conclusion, their own assessment will not stray far from what the program decided. The reason is the person was "anchored" to the first piece of information offered.[53] As I expand on later, if the human adjudicator is unlikely to override the algorithm's recommendations, this can constitute an illegal fettering of discretion.[54] It is for these reasons that an AI decision support tool that provides explicit recommendations goes too far, in my view, in that it could potentially generate bias and thereby constrain discretionary decision-making. An AI decision support tool should not, for example, produce a draft judgment based on the system's desired outcome.[55] A more detailed discussion of this threshold issue of recommendations vs. information is given in subsequent sections.

Adjudication, Litigation, and Mediation AI

Adjudication AI

AI is now playing a role in certain limited instances when cases are before courts of law. A legal expert system is being used by judges in Mexico to determine whether a plaintiff is entitled to a pension, and in what amount. A "risk score" algorithm developed by Northpointe is

[51] See Peter Wright, "The harassed decision maker: Time pressures, distractions, and the use of evidence" (1974) 59:5 *Journal of applied psychology* 59, at 555.
[52] David Lyell and Enrico Coiera. "Automation bias and verification complexity: a systematic review" (2016) 24:2 *Journal of the American Medical Informatics Association* at 423-424.
[53] Ryan Wesslen, Sashank Santhanam, Alireza Karduni, Isaac Cho, Samira Shaikh, and Wenwen Dou. "Anchored in a Data Storm: How Anchoring Bias Can Affect User Strategy, Confidence, and Decisions in Visual Analytics." *arXiv preprint* (2018).
[54] See *Kanthasamy v Canada,* 2015 SCC 61*; Little Sisters Book and Art Emporium v. Canada,* 2000 SCC 69, *[2000] 2 S.C.R. 1120*.
[55] Tania Sourdin, "Justice and technological innovation" (2015) 25:2 Journal of Judicial Administration, online: < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2713559>.

an example of predictive analytics being used, in this case to evaluate the recidivism risk of criminal defendants.[56] Specifically, a computer-generated score out of 10 helps a judge determine whether to grant bail and how long to sentence convicted criminals.[57] Kleinberg and colleagues write favourably that "reliance of the bail decision on a prediction makes this an ideal application that plays to the strengths of machine learning".[58] However, ProPublica has reported that the new algorithmic method introduces "machine bias" against racial minorities.[59] A challenge based on due process was made by a Wisconsin inmate, but the Wisconsin Supreme Court rejected it despite the fact that the details of the software were unavailable to the inmate on propriety grounds.[60] The court held that judges' consideration of these algorithmic outputs is permitted so long as they are not the sole basis of the decision.[61] Nevertheless, more public interest litigation challenging the use of algorithmic risk scores is sure to follow, given the nature

[56] See COMPAS risk scores *supra* note 24..

[57] While our Superior Court judges in Canada do not use algorithms, Corrections Canada do use standardized actuarial tests. Dangerous offender hearings typically rely on the "PCL-R" (Psychopathy test) or "V-RAG" (Violence Risk Appraisal Guide) to evaluate whether an offender should be held indefinitely. These tests are statistical, scientific, and ostensibly more objective than a psychologist's subjective opinion. These assessment tests have proven controversial, however, in terms of their reliability in application to cultural minorities. See Paul Barnsley, "Judge orders Corrections Canada to deal with culturally biased testing of Aboriginal inmates", APTN National News, online: <http://aptnnews.ca/2015/10/05/judge-orders-corrections-canada-to-deal-with-culturally-biased-testing-of-aboriginal-inmates/>. Most recently, these tests were held to be biased by the Supreme Court of Canada in *Ewert v Canada,* 2018.

[58] Jon Kleinberg, Himabindu Lakkaraju, Jure Leskovec, Jens Ludwig, and Sendhil Mullainathan, "Human decisions and machine predictions" (2017) 133:1 *The quarterly journal of economics* at 237-293, online:<http://www.cs.cornell.edu/HOME/KLEINBER/w23180.pdf>.

[59] Julia Angwin, Jeff Larson, Surya Mattu, and Lauren Kirchner, "Machine Bias", *ProPublica* (May, 2016), online: <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>.

[60] Principle 8 of the Asilomar AI Principles, endorsed by many "thought leaders", states that "any involvement by an autonomous system in judicial decision-making should provide a satisfactory explanation auditable by a competent human authority". See Future of Life Institute, online: <https://futureoflife.org/ai-principles/?cn-reloaded=1>.

[61] *State v Loomis,* 881 N.W.2d 749 (Wis. 2016)

of the rights at stake and the oft-noted transparency issue concerning the "black box" nature of ML programs in general.[62]

In the Canadian context, the federal government is looking to develop AI tools for frontend immigration decision-makers dealing with applications like humanitarian and compassionate consideration (H&C) and Pre-Removal Risk Assessments (PRRAs).[63] It is not too great a leap to suggest that AI aids could eventually be made available to tribunal adjudicators as a means, for instance, of improving the efficiency, effectiveness, and consistency of decision-making.

Litigation AI

AI is impacting the legal process primarily prior to the hearing phase, as it is being used (on a limited basis) to assist the party/parties in preparing arguments and deciding whether and how to move forward. These applications are just starting to see prevalence in the context of "big law".[64] Several prominent law firms have purchased AI systems that perform such tasks as automated contract drafting, "e-discovery", and, most pertinently, making predictions about the outcomes of litigation.[65]

Litigation AI might be beneficial to the legal system if certain safeguards are put in place. One possible approach is to treat the underlying algorithm similarly to expert evidence.[66] The

[62] See, for example, Matthias Spielkamp, "Inspecting Algorithms for Bias", *MIT Technology Review* (June, 2017), online: < https://www.technologyreview.com/s/607955/inspecting-algorithms-for-bias/>; and Jason Tashea, "Courts are Using AI to Sentence Criminals. That Must Stop Now", *Wired Magazine* (17 April 2017), online: < https://www.wired.com/2017/04/courts-using-ai-sentence-criminals-must-stop-now/>.
[63] These are two areas where profoundly consequential decisions are made about immigration status and deportability respectively.
[64] "The In-House Counsel's Legal Tech 2018 Buy's Guide", LawGeex.
[65] *Ibid.*
[66] The idea for this option was developed in correspondence with Osgoode Professor Sean Rehaag (the idea has not been published anywhere). Though I develop it here, I give him credit for initially proposing it.

algorithm would be introduced as evidence by one or more parties and would be subject to notice, disclosure, and cross-examination obligations, albeit within certain limits.[67] In a tribunal setting, these obligations would likely be relaxed consistent with the comparative informality of the proceedings. Concern has been raised that litigation AI could induce a "wave of amateurs who are not hiring lawyers but making sophisticated arguments that they may not understand, and in turn receiving judgments they may understand even less".[68] This could seriously undermine public confidence in courts or tribunals and add to already over-burdened dockets. On the other hand, a function of predictive analytics that could mitigate this concern is the probabilistic assessment of a party's success. Potential litigants informed by AI might actually may be less inclined to pursue "frivolous" litigation and claims before tribunals, conserving public resources.

There should also be efforts taken to address the problem of asymmetrical access to algorithmic power. Legal research tools (e.g. Westlaw and Quicklaw) for a long time were only accessible by the well-resourced. Similarly, outcome prediction services now on the market like Blue J Legal's "Tax Foresight" and "Employment Foresight" are currently very expensive, only accessible to litigants with means.[69] In the way that free access to CanLII evened the playing field, we would need a "CanLII" of legal AI algorithms, making algorithmic insights readily available to all parties regardless of financial means. Before that occurs, selective access to algorithms risks tilting the scales of justice further towards more powerful parties – not a positive development for the administration of justice. In the meantime, the scenario of algorithms being

[67] One interesting question is whether the underlying data should be subject to disclosure review. This might create additional privacy concerns unless anonymization practices are conscientiously and competently followed.
[68] Email correspondence with Ryan Fritsch (16 March 2018).
[69] Blue J Legal's website does not specify a price for their AI tools, but based on the companies listed under their "customers" tab it seems reasonable enough to assume it is expensive. See online: http://www.bluejlegal.com/faq.>.

used by adjudicators as decision support tools is one that is less likely to result in this particular disparity in access to justice.

Mediation AI

In future, Mediation AI could look like the current instances of Online Dispute Resolution (ODR) but with predictive analytics capabilities and/or without the supervision of human mediators.[70] ODR in its present form is either a very basic form of AI, or some might argue it is not a true example of AI. Nonetheless, ODR tribunals are prime grounds for the uptake of AI, particularly ML algorithms. A pioneering example of ODR is the British Columbia Civil Resolution Tribunal (BCCRT) which uses an online platform to guide disputes through negotiation and informal dispute resolution. Disputants make initial contact and commence their proceedings online. Cases are then decided on evidence and arguments entirely submitted to the online platform.[71]In necessary circumstances, the adjudicator will "have discretion to conduct a telephone or video hearing".[72] Given its characteristics of being online and for early-resolution, ODR would likely be a suitable low-impact testing bed for legal AI that could later be applied elsewhere in the legal system. One problem, however, might be if there is a wide variety of issues heard through an ODR platform. This breadth could hinder efforts to test and train a ML algorithm. In the case of the BCCRT, however, a narrow focus that includes strata disputes is promising in this regard. Ultimately, it is possible that early adoption and relatively effective use

[70] For a discussion on the utility of ML for ODR see Benyekhlef and Vermeys, *supra* note 42.
[71] *Ibid.*
[72] *Ibid.*

of AI in ODR might create competitive pressures that stimulate uptake of AI in courts and tribunals.[73]

Tribunals: From Administrative to Algo-Ministrative

Administrative tribunals review a wide variety of consequential matters, including disability pensions, workplace injuries, human rights laws, mental competence issues, social welfare benefits, residential landlord and tenant issues, employment standards, and immigration appeals. Indeed, the areas covered by tribunals span the breath of the regulatory and welfare state. It is the administrative justice system, rather than legislatures, the executives, or the courts, where "most legal decisions are made" according to former Chief Justice of the Supreme Court of Canada Beverly McLachlin.[74] What tribunals offer is complementary to the courts as they are designed to be fast and flexible, as well as expert in their allocated subject matter.[75] A tribunal is a "master of its own procedure" so long as it applies rules of "natural justice" otherwise known as procedural fairness.[76] De Smith neatly summarizes that tribunals were set up to deal with "particular classes of issues which it has been thought undesirable to confide either to the ordinary courts of law or to the organs of central or local government."[77] In Ontario alone there

[73] Tania Sourdin, "Justice in the age of technology: The rise of machines is upon us." (2017) 139 *Precedent (Sydney, NSW)* at 7.
[74] "Administrative Tribunals and the Courts: An Evolutionary Relationship: Remarks of the Right Honourable Beverley McLachlin, P.C. Chief Justice of Canada", 6th Annual Conference of the Council of Canadian Administrative Tribunals, Toronto, Ontario online:< https://www.scc-csc.ca/judges-juges/spe-dis/bm-2013-05-27-eng.aspx>.
[75] *Alberta (Information and Privacy Commissioner) v. Alberta Teachers' Association,* 2011 SCC 61 at para 55.
[76] Cambie Hotel (Nanaimo) Ltd v British Columbia (General Manager, Liquor Control and Licensing Branch), 2006 BCCA 119 at paras 38, 40, 265 DLR (4th) 657; Reg. v. Deputy Industrial Injuries Commissioner, Ex parte Moore, [1965] 1 Q.B. 456; [1965] 2 W.L.R. 89; [1965] 1 All E.R. 81.
[77] De Smith, Judicial Review of Administrative Action, 2ed (London: Stevens & Son, 1968) at 14.

are hundreds of administrative tribunals which make over one million rights-related determinations each year.[78]

Arguably, tribunals are fertile grounds for the uptake of algorithmic technologies as these technologies promise to heighten the traits that tribunals were designed for, including efficiency and subject-matter expertise. Tarantino notes that of all justice sector processes, tribunal adjudications might be the most apt for algorithmic enhancement.[79] This is particularly because "we already calibrate adjudicative processes for solemnity, procedural rigour and cost to reflect conventional views of what kinds of claims or disputes "matter" and to what extent they do so".[80] If ASA is faster and cheaper than a "human alone" alternative, it might be considered preferable by many to make reforms enabling it in tribunal adjudication.

AI-Supported Adjudication

Decision-making is the outcome of an analytic process "leading to the selection of a course of action among several alternatives".[81] Daly highlights how "Decisions and the decision-making processes that produce them will always be individuals' first points of contact with administrative law."[82] With the latest advances in AI supporting decisions in a range of contexts, it is timely to investigate the methods which will create the best and most desirable results in tribunal adjudication. Integrating AI into tribunal adjudication should not be designed to take the

[78] Administrative Justice Working Group, *Submission to the Ontario Law Reform Commission on Research Priorities* (March 2007).
[79] Bob Tarantino, "Should justice by delivered by AI?" (April 2018), Policy Options, online: < http://policyoptions.irpp.org/magazines/april-2018/should-justice-be-delivered-by-ai/>.
[80] *Ibid.*
[81] Norbert Sram, "A hybrid approach to decision making and problem analysis" (2010) In *Robotics in Alpe-Adria-Danube Region (RAAD), 2010 IEEE 19th International Workshop on*, pp. 431-433, online:<https://ieeexplore.ieee.org/document/5524548/.>
[82] Paul Daly, "Judicial Review and Administrative Decision-Making" (October 2013), online: < http://www.administrativelawmatters.com/blog/2013/10/28/judicial-review-and-administrative-decision-making/>.

decision away from the adjudicator, but rather help them make a quicker and potentially more optimal one.

With all the commentary circulating about AI "replacing lawyers", it is probably safe to say neither lawyers nor tribunal adjudicators will be replaced. Remus and Levy argue that predictions about AI coming for legal jobs is fear-mongering, and "fails to engage with technical details . . . critical for understanding the kinds of [legal] tasks that computers can and cannot perform."[83] In fact, the ASA model that I am prosing is intended to leverage the unique attributes of human decision-makers without ignoring the potential complementary benefits of AI. The Australia Law Reform Commission points out that many factors impact on legal adjudication, including induction, intuition, and the capacity to assess the social impact of decisions.[84] These facets of decision-making are what make human involvement so crucial. But as Kelly and Hamm describe, "In the era of cognitive systems, humans and machines will collaborate to produce better results, each bringing their own superior skills to the partnership".[85] Despite AI's analytical advantages, human adjudicators will likely be much better in the scenario of a novel case.[86] This is where human creativity and judgment becomes a significant asset. Without this creativity it is possible for patently unjust or unsound outcomes to occur in particular cases, and for a "freezing" of the law at a more systemic level. With humans at the helm, legal decision-making will continue to adapt to changing social norms and conditions.

[83] Dana Remus and Frank Levy, "Can Robots Be Lawyers: Computers, Lawyers, and the Practice of Law" (2017) 30 *Geo. J. Legal Ethics* at 501.
[84] ALRC, "Review of the Adversarial System of Litigation: Technology – What it Means for Federal Dispute Resolution" (1998) (Issues Paper No. 23), at 100.
[85] John E. Kelly III, and Steve Hamm. *Smart machines: IBM's Watson and the era of cognitive computing* (Columbia University Press, 2013).
[86] The usefulness of AI systems is stretched when the inputted rules or training data do not relate to new information presented to them, see Sourdin 2015. However, there are examples where ML algorithms have dealt well with novelty, see Google's DeepMind "Alpha Go" program, and medical diagnosis.

At the same time, human judgment is subject to a variety of constraints and biases according to the well-supported theory of "bounded rationality".[87] The shortcomings of human cognition and judgment are well known, and historically had to be accepted as inherent and as relatively unfixable. Indeed, it has been said that "Every judge…unavoidably has many idiosyncratic leanings of the mind…which may interfere with his fairness at trial."[88] Contemporary research has demonstrated many instances where extra-legal factors can sway judgments. These include whether an adjudicator has eaten lunch, the number of decisions the person made earlier in the day, personal values, unconscious assumptions, reliance on intuition, the attractiveness of the individuals involved, and emotion.[89] Notably, AI can perform tasks without certain encumbrances typical of human cognition, including biological limitations like fatigue. As well, it is argued by some that algorithms are able to avert cognitive fallacies and systematic errors, although this is complicated as they may be hard-coded with their own systemic errors.

In sum, the "human alone" legal decision-making model may not be the best of all possible models. While AI introduces some of its own problems, it is argued that a combined effort of human and AI best addresses the shortcomings associated each type of decision-maker acting on their own. It is possible that the statutory requirement of "merit-based appointments" to tribunals could one day be interpreted to include AI decision support tools. The competencies that must be required as part of hiring certainly does not rule this out; they currently include

[87] See Herbert A. Simon, "Theories of bounded rationality." (1972) 1:1 *Decision and organization*, 161-176.
[88] Justice Jerome Frank in *Re JP Linaham* 1943, 652; Gerd Gigerenzer and Reinhard Selten, eds. *Bounded rationality: The adaptive toolbox*. MIT press, 2002; and Daniel Kahneman, "Maps of bounded rationality: Psychology for behavioral economics." *American economic review* 93, no. 5 (2003): 1449-1475.
[89] See for example Craig E. Jones, "The troubling new science of legal persuasion: heuristics and biases in judicial decision-making" (2013) 41 *Advoc. Q.* at 49; Hayley Bennett, and G. A. Broe. "Judicial neurobiology, Markarian synthesis and emotion: How can the human brain make sentencing decisions?" (2007) 31:2 *Criminal Law Journal-SydneyCRIMINAL LAW JOURNAL-SYDNEY at* 75.

"experience, knowledge or training in the subject matter" (of the Tribunal) as well as an "aptitude for impartial adjudication".[90] In further support of ASA, the requirement that adjudicators possess expertise has been recently supplemented by the notion of "institutional expertise": "expertise should not be seen as solely related to the particular skills, experience, and competencies of individual members" but should include "institutional expertise".[91] Institutional expertise has thus far been defined as including such things as "mechanisms for the continuing education of members and for the evaluation of their decisions, and the regular holding of full board meetings where members can share their experience and collectively reflect on jurisprudential developments".[92] AI decision support tools have the potential to heighten the institutional expertise of the tribunals that adopt them.

Illustrative Use Cases

I offer two illustrative use cases to further clarify what I mean by ASA. In this first one, adjudicators would use AI in an informational sense as a means of enhancing traditional legal research. This can be contrasted with an AI "recommendation" program. The adjudicator would input the facts of the case. Next, the AI program would return a list of relevant cases, statutory provisions, and even "soft law" policy manuals based on the provided facts. The AI would rank the results in terms of their perceived relevance, but also go beyond this by highlighting key words or passages and providing information about why it thinks a certain source is relevant. Taking the leap to making a recommendation at this point would involve distilling the considered

[90] Adjudicative Tribunals Accountability, Governance and Appointments Act, 2009, SO 2009, c 33, Sch 5, s 14(1). The government may make exceptions to this. See s 2 of Appointment to Adjudicative Tribunals, O Reg 88/11, where the requirement for a competition in a number of circumstances including re-appointments and cross-appointments is waived.

[91] *Ryan v Canada (Attorney General)*, 2005 FC 65(CanLII) at para 14, [2005] FCJ 110. See also R E Hawkins, "Reputational Review I: Expertise, Bias and Delay" (1998) 21:1 Dal LJ 5 at 9-26.

[92] Finn Makela, "Acquired Expertise of Administrative Tribunals and the Standard of Judicial Review: The Case of Grievance Arbitrators and Human Rights Law." *Canadian Lab. & Emp. LJ* 17 (2013): 354.

information into an answer and providing a confidence level associated with the answer. This would be problematic as it may (1) discourage the decision-maker to go against the AI's recommendation (an easy ground for appeal, inviting more scrutiny), and (2) discourage the decision-maker from investigating the information for themselves because they may assume the program already did that adequately. By way of analogy, information-gathering AI programs seem much closer to the role of legal counsel, whom already have the job of providing and presenting legal information for the decision-maker to consider. Contrastingly, a recommendation system would be like a supposedly neutral lawyer for the decision-maker responsible for making a recommendation in that particular case. Albeit free to disagree with an AI's recommendation, that output value would carry a lot of weight because of the supposed deeper legal expertise and broader perspective of the program. There is a concern that the information-gathering program will not return all of the relevant information or not assign accurate weights to it. However, this seems like a solvable problem and one in any case that could just as readily describe the shortcomings of human adjudicators.

A second potential use case is a harnessing of the predictive analytics of ML in the context of refugee determinations. Adjudicators must make complex determinations about the likelihood of claimants being persecuted in foreign countries due to protected characteristics (i.e. race, religion, and nationality), and do at a "near-frantic pace" given the high volume of cases.[93] Grant and Rehaag highlight how this task is made difficult not only by its "forward-looking" and "predictive" nature, but also in its engagement with factual findings about conditions in foreign countries where "information may be scant and unreliable"[94] This appears to be a task for which

[93] Grant and Rehaag, *infra* note 94.
[94] Angus Grant and Sean Rehaag. "Unappealing: An Assessment of the Limits on Appeal Rights in Canada's New Refugee Determination System''(2016) 49." *University of British Columbia Law Review* 1: 203, online:

predictive ML algorithms could make valuable contributions. As mentioned earlier, future-oriented analysis is a task most human decision-makers struggle with and one that happens to be the "bread and butter" of ML algorithms. Similar to the previous use case, this AI system would not directly evaluate the likelihood of persecution. Rather, it would search for relevant documentary evidence and rank-order them by relevance, offering explicit justification for these choices. The algorithm would be trained on all available Immigration and Refugee Board decisions for that country of origin, parsing the decisions that most relate to the applicant based on personal characteristics and the particular facts of the case.

Risks and Implementation Challenges of ASA

The most important question is not *can we* but rather *should we* develop and deploy AI-supported adjudication (ASA). The normative question of *should* will be approached by examining whether ASA is consistent with three of the administrative justice system's core commitments: namely, to 1) lawful delegation of decision-making, 2) procedural fairness, and 3) having (human) judges play a vital oversight function. There are other core values and considerations to be sure, but these are largely left to be explored elsewhere.

It is not immediately apparent that today's procedural safeguards and substantive oversight mechanisms are able to seamlessly adapt to the use of AI in tribunal decision-making. According to several scholars, it will be a challenge to ensure that algorithmic justice is fair,

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<http://digitalcommons.osgoode.yorku.ca/cgi/viewcontent.cgi?article=1129&context=olsrps>; see also France Houle, "The Credibility and Authoritativeness of Documentary Information in Determining Refugee Status: The Canadian Experience" (1994) 6:1 Int J Refugee L 6; Susan Kerns, "Country Conditions Documentation in US Asylum Cases: Leveling the Evidentiary Playing Field" (2000) Indiana J Global Legal Studies 197; Arwen Swink, "Queer refuge: A review of the role of country condition analysis in asylum adjudications for members of sexual minorities" (2005) 29 Hastings Int'l & Comp L Rev. 251.

transparent, and accountable.[95] Some view any automation of decision-making as compromising transparency and resulting in "adjudication in secret"; others are cautiously optimistic, believing it is possible even without full transparency to have "accountable algorithms".[96] Still others contend that the effort to uncover the secrets of ML algorithms is a kind of fruitless, "fetishistic" behaviour.[97]

Lawfulness

When an algorithm is consulted, there is a question as to whether the human adjudicator or the algorithm is the primary decision-maker. It is a question of liability, responsibility, and authorized delegation of decision-making authority. Somebody, or some "thing", must be the locus of responsibility. A fundamental tenant of the rule of law is that a decision-maker purporting to exercise a public decision-making power must have statutory authorization.[98]Absent any statutory intervention, it would be likely that the tribunal would be responsible for any algorithms which supports its decision-making process. However, if it were the algorithm as decision-maker, this must be explicitly authorized by statute. This would be a

[95] John Danaher, "The Threat of Algocracy: Reality, Resistance, and Accommodation" (2016), Forthcoming in *Philosophy and Technology,* online: <https://philpapers.org/archive/DANTTO-13.pdf>.
[95] Danielle Keats Citron, "Technological Due Process" (2008) 85 Washington University Law Review, 1249 at 1253.
[96] Ibid; see also Joshua A. Kroll, Joanna Huey, Solon Barcas, Edward W. Felten, Joel R. Reidenberg, David G. Robinson, & Harlan Yu, "Accountable Algorithms" (2016) 165:3 Pennsylvania Law Review, online:< http://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=9570&context=penn_law_review>.
[97] Torin Monahan, "Algorithmic Fetishism" (2018) 16:1 *Surveillance & Society*. See also Suzanne L. Thomas, Dawn Nafus, and Jamie Sherman. "Algorithms as fetish: Faith and possibility in algorithmic work." (2018) 5:1 *Big Data & Society*.
[98] Mary Liston "Administering the Canadian Rule of Law" in Colleen M. Flood and Lorne Sossin (eds), *Administrative Law in Context 3rd ed*. (Toronto: Emond Montgomery, 2017) at 2:4; In a leading rule of law case, *Roncarelli Roncarelli v. Duplessis, [1959] SCR 121 (judgments of Rand J. and Cartright J.)* an issue was whether a decision supposed to be taken by the commissioner was made instead by the Quebec premier.

challenge, given that "statutory delegates" have only ever been imagined as "persons" by the legislature.[99]

So long as the human understands the basis for the algorithm's recommendation and is deciding autonomously this seems to square with rule of law requirements. As I contended earlier, however, a clean distinction between the human and the algorithmic aid is somewhat illusory in practice. The human would have to be able to override, or else they have lost their discretion to a computer essentially making automated decisions. Yet the phenomena of "automation bias" and "anchoring" described earlier suggest that the human decision-maker would not want to stray too far from the comforts of agreeing with something so seemingly empirical and scientific.[100] Mariano-Florentino Cuéllar observes how, because of such tendencies, it "becomes difficult to tell where an algorithm's 'nudge' ends and an accountable individual's choice begins".[101] If watertight compartments between algorithm and adjudicator are not possible in practice, this needs to be addressed transparently. Legislative delegation of some kind, even for AI decision support tools, may be needed to preserve the rule of law.[102]

Procedural Fairness

Nicholson v. Haldimand-Norfolk held that a duty to act fairly applies in an administrative context. Though the degree of procedural fairness owed will depend on the individual

[99] *Ibid.*
[100] "Juvenile Detention Risk Assessment: A Practice Guide to Juvenile Detention Reform," The Annie E. Casey Foundation (2006) 44, online: <http://www.aecf.org/m/resourcedoc/aecf-juvenileddetentionriskassessment1-2006.pdf> (Notably, a study in the U.S. on algorithm-aided decision-making in the context of juvenile justice found that "detain overrides" (when the algorithm provides a low risk estimate) are much more frequent than "release overrides" (when the algorithm provides a high-risk estimate). It is unknown if this same override pattern would hold in the Canadian administrative context).
[101] By consequence, it may "prove difficult to limit the influence of computer programs" even in subordinated "decision support" roles. Mariano-Florentino Cuéllar, "Cyberdelegation and the Administrative State" in *Administrative Law from the Inside Out: Essays on Themes in the Work of Jerry L. Mashaw*, Nicholas R. Parrilo (ed) (Cambridge, UK: Cambridge University Press, 2017).
[102] Query whether this legislative delegation is something that we would want on broader policy grounds.

circumstances of the case at hand, a baseline standard is that participants in administrative justice have a right to participate and meaningfully understand decisions made about their rights, interests, and privileges. [103] This was articulated by L'Heureux-Dubé J. in *Baker* as a right to be heard, entailing a "fair, impartial, and open process".[104] The scholarship of Thibaut and Walker indicates that if people believe they have been treated fairly they will be more accepting of the legal outcome.[105]

There have been serious concerns about whether algorithms are sufficiently transparent to satisfy the requirements of procedural fairness in administrative law. Garapon argues, "If predictive justice doesn't want to end up being considered as a divinatory art, as mysterious and intimidating as the ancient oracles, it must disclose its algorithms".[106] There are at least three layers of opacity that need to be reckoned with.[107] An "intentional" layer describes when humans intentionally obscure the working of an algorithm. The manufacturer/programmer might assert trade secret protections. There may also be grounds to obscure based on concerns of "gaming the system" or under requirements provided in the *Privacy Act* to protect certain types of personally identifiable information.[108] An "illiterate" layer stems from the fact that most people lack the technical expertise to understand code or other technical dimensions of algorithmic reasoning. Even if the source code is shared, a solution proposed by many, the illiteracy issue remains a problem. Finally, an "intrinsic" layer speaks to the reality that certain algorithms are a "black

[103] *Baker v. Canada (Minister of Citizenship and Immigration)*, [1999] 2 SCR 817. (For example, Nicolson, a probationary police officer, was owed only minimum procedural rights whereas Baker, a person at risk of deportation, was owed more; see also *Ocean Port* re: independence of decision- maker).
[104] *Ibid Baker,* para 28.
[105] John W. Thibaut and Laurens Walker, *Procedural justice: A psychological analysis*. L. Erlbaum Associates, 1975.
[106] "Predictive justice: when algorithms pervade the law", (June 2017) Paris Innovation Review, online:< http://parisinnovationreview.com/articles-en/predictive-justice-when-algorithms-pervade-the-law>.
[107] Jenna Burrell, "How the machine 'thinks': Understanding opacity in machine-learning algorithms" (2016) *Big Data and Society*.
[108] *Privacy Act,* RSC 1985, c. P-21.

box", especially those based on machine learning.[109] Blue J Legal's "Tax Foresight" program, which predicts the outcomes of tax court decisions, gives its users a confidence score associated with the prediction and a short dossier detailing its reasoning.[110] This sounds more promising that source code sharing, but requires that we defer our judgement about how the algorithm reasoned to the algorithm itself; slightly bizarre in this context given that it is the algorithm we are scrutinizing.[111]

At minimum, at least some information about the algorithms used by tribunal adjudicators will need to be made publicly available. Section 5(1)(c) of the *Access to Information Act* mandates annual reporting to be carried out by government ministries including "a description of all manuals used by employees of each government institution in administering or carrying out any of the programs or activities of the government institution".[112] The *Statutory Powers Procedure Act* governing tribunals in Ontario similarly requires tribunals to make any "rules or guidelines established under this or any other Act available for examination by the public".[113] Whether by legislative modification or broad interpretation of the existing clauses, algorithms should be included under these public disclosure provisions.

As Glover notes, another aspect of procedural fairness is a right to an unbiased adjudicator.[114] It is important for participants in administrative justice to not have a "reasonable

[109] See Jorge Casillas et al, "Interpretability issues in fuzzy modeling" (5 June 2013) 128 Springer (This is also called the "interpretability problem" in the computer science literature).
[110] Informal discussion with Avi Brudner of Blue J Legal.
[111] Norton Rose Fulbright "AI Summit" (15 November 2017) (A certain level of technical understanding is probably a baseline for accountability. Canadian lawyer Jane Caskey calls for "white boxing" solutions that dissect and deconstruct algorithms).
[112] *Access to Information Act*, R.S.C., 1985, c. A-1, s. 5(1)(c).
[113] *Statutory Powers Procedure Act*, R.S.O. 1990, c. S.22, s. 27.
[114] Kate Glover, "The Principles and Practices of Procedural Fairness" in Colleen M. Flood and Lorne Sossin (eds), *Administrative Law in Context* 3rd (Toronto: Emond Montgomery, 2017).

apprehension of bias".[115] *Baker v Canada* states the test for bias in administrative law: "what would an informed person, viewing the matter realistically and practically…conclude. Would he think that it is more likely than not that [the decision-maker], whether consciously or unconsciously, would not decide fairly".[116] Further, the decision-maker needs to have "an open mind which is open to persuasion", but the onus is on the person seeking to demonstrate bias. [117] This burden can be difficult to meet given the grounds for bias based on this test must be fairly substantial ("probability of bias").[118] Importantly, algorithms do not have "intentionality" so the "open mind" analysis must centre on the human adjudicator. However, a person could challenge whether the algorithm made its recommendation based on irrelevant factors. Algorithms could also be challenged is the associated agency/ministry could be shown to be using the algorithm in a way that furthers an internal policy goal, such as winnowing out applications in the immigration and refugee context.[119] The remedy for a successful demonstration of bias would be quashing the decision and sending it back to be heard *de novo.* In this context, it would seem appropriate to redo the decision manually and without any algorithmic input.

Algorithms in other contexts have made demonstrable errors. Examples include flagging the innocent as terrorists, sending sick patients home from the hospital, wrongly depriving people of their jobs and car licenses, and chasing the wrong individuals for child support bills.[120] These examples set a backdrop for assessing whether the reasonability threshold for apprehension of bias is crossed. Particularly, applicants or respondents from minority groups

[115] *Ibid.*
[116] *Baker v Canada, supra* note 103, para 46.
[117] See *Wewaykum Indian Band v. Canada*, [2003] 2 S.C.R. 259, 2003 SCC 45; *Newfoundland Telephone Co. v Newfoundland (Board of Commissioners of Public Utilities),* [1992] 1 S.C.R. 623.
[118] R. v S. (R.D.), [1997] 3 SCR 484.
[119] See *Geza v Canada (Minister of Citizenship and Immigration)* 2005 FCA.
[120] Stephen Buranyi, "Rise of the racist robots: how AI is learning all our worst impulses" (8 August 2017), *The Guardian,* online: <https://www.theguardian.com/inequality/2017/aug/08/rise-of-the-racist-robots-how-ai-is-learning-all-our-worst-impulses>.

may have a reasonable apprehension of algorithmic bias. Latanya Sweeney found racial discrimination in Google's personalized ads (a search for a "black" name is much more likely to turn up targeted ads about arrests).[121] As noted, according to ProPublica criminal defendants of colour are more likely to be mislabelled as "high risk" by risk score algorithms than are white criminal defendants.[122] Indigenous peoples might have a reasonable apprehension of bias unless AI systems making decisions about them are tested using meaningful consultation. This is an especially pertinent point given the recent Supreme Court of Canada decision in *Ewert v Canada.* This decision held that statistical personality assessment tools used by Corrections Canada in prisons are biased against Indigenous inmates because they were never tested to any scientifically significant degree with Indigenous subjects.[123] They were thus found to be liable to making errors that would unjustifiably deprive Indigenous people's liberty.

Could algorithms be created for tribunals that are less likely to discriminate? Greater diversity in programmers and a vigilant attention to the risks of proxy variables would be a start. There are at least two levels where racial bias can be "baked in" into an algorithm – its programming and the data that feeds it. Programmers tend to be from one demographic (white male), creating a kind of tunnel vision in the design process.[124] On the data side, algorithmic outputs like risk scores might be disguising "overt discrimination based on demographics and

[121] Latanya Sweeney, "Discrimination in Online Ad Delivery" (29 January 2013), online: <https://arxiv.org/abs/1301.6822>.
[122] Julia Angwin, Jeff Larson, Surya Mattu, and Lauren Kirchner, "Machine Bias: There's software used across the country to predict future criminals. And it's biased against blacks" (23 May 2016), *ProPublica*, online:<https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>.
[123] *Ewert v. Canada*, 2018 SCC 30.
[124] Jack Clark, "Artificial Intelligence Has a 'Sea of Dudes' Problem" (23 June 2016), *Bloomberg Technology*, online: < https://www.bloomberg.com/news/articles/2016-06-23/artificial-intelligence-has-a-sea-of-dudes-problem>.

socioeconomic status". [125] This latter problem is difficult to solve. It is one thing to execute the substantive policy choice to be "blind to race", for instance, by not inputting any explicit race variables.[126] However, seemingly neutral factors can act as proxies for racially protected characteristics. A prominent example is found in "redlining" where banks would refuse services to people with certain zip/postal codes which strongly correlated with race. If we are to make algorithms less biased, we need to think not only about overt discrimination. Moreover, we need to be keenly aware of tendencies like data worship and "mathwashing"; the idolization of algorithms because they run on mathematics.[127] These tendencies to blindly trust numbers may prevent some people from seeing discriminatory effects associated with algorithmic justice.

A concept related to procedural fairness is tribunal independence. Tribunals only have the power delegated to them by government, but still maintain independence from the executive. Tribunal independence is not a "right for the adjudicator, but a right that belongs to the parties."[128] A concern about ASA is that if government commissions or develops the algorithm, this could import managerialism and government policy goals into the administrative justice sector. Thus, the executive sector's seeking of AI-delivered efficiencies could potentially come at the expense of tribunal independence. This is an understandable concern, and any overstepping by the executive would have to be monitored closely.

Judicial Oversight/Substantive Review

[125] Sonja. B. Starr, "Evidence-Based Sentencing and the Scientific Rationalization of Discrimination" (2014) 66(4) Stanford Law Review 803 at 806.
[126] Kroll et al., *supra* note 96.
[127] Tyler Woods, "'Mathwashing', Facebook and the zeitgeist of data worship" (8 June 2016), online: < https://technical.ly/brooklyn/2016/06/08/fred-benenson-mathwashing-facebook-data-worship/>.
[128] Gottheil, *supra* note 28.

There are many mechanisms for legal accountability and oversight.[129] Still, judicial review remains of key importance in the Diceyan sense that it directly enforces the rule of law.[130] The typical standard of review for tribunal decisions is reasonableness.[131] Under this standard, the courts generally defer to the administrative decision-maker's reasoning. However, this does not mean that an adjudicator's decision is totally immune from judicial review; the decision must be "reasonable".[132] One ground for review of an algorithm-aided decision might be if the human relied on the algorithm in "literal obedience" without considering the circumstances of the applicant/respondent "as a whole"[133] As Lorne Sossin notes, "the algorithm decision-making itself could be seen as fettering discretion if the criteria for the algorithm were less inclusive, or otherwise distorting of the actual criteria for the decision."[134] Ironically, another ground of review might be not engaging with the algorithm's recommendation enough. Would such recognition of the epistemic superiority of the algorithm be a modification of the reasonableness review? Logically, the human's range of "reasonable choices" would have to include overriding the algorithm or the court would be creating problems for legality discussed earlier. But the question is how far the reviewing court would allow the human decision-maker to stray from a tool that is meant to improve the administration of justice. This is a question to be further explored elsewhere.

Another issue concerns the relationship between reasonableness and reasons. Administrative law has a "longstanding faith in the prophylactic power of requiring explicit

[129] Liston, *supra* note 32 (Among them Mary Liston names "public inquiries, royal commissions, task forces, department investigations…and ombudsmen").
[130] *Ibid.*
[131] *Dunsmuir v. New Brunswick*, [2008] 1 SCR 190, 2008 SCC 9 para 49.
[132] *Ibid,* para 64.
[133] *Kanthasamy, supra* note 46, para 45.
[134] Email from Lorne Sossin (1 December 2017).

reasons", a faith given practical manifestation by the Supreme Court in the *Baker* decision.[135] In addition to traditional rationales, one specific to algorithm-aided decisions is that explicit evaluation for the basis of the decision would likely mitigate automation bias.[136] "Reasons" must meet the necessary indicia of justification, intelligibility, and transparency[137] Reasons could be found insufficient, then, if they seem to overly defer to the algorithm, or fail to cast any light on the algorithm's reasoning. What if the algorithm's reasoning is cloaked behind trade secret protections, privacy requirements, and policy interests that militate against full disclosure? Additionally, there is the problem of inherent opacity in ML programs which has yet to be solved. Koll and colleagues discuss the difficulties of ML for source code analysis (trying to find and isolate the data-driven rule guiding the program's outputs). They note that the source code alone "teaches a reviewer very little, since the code only exposes the machine learning method used and not the…decision rule".[138] It may still be possible for reasons of the decision-maker to be adequate, but they would likely have to do their best to explicitly map out all the considerations that were made beyond the algorithm, justifying how and why the algorithm factored into the final decision.[139]

Ultimately, substantive review seeks to balance competing interests: the individual's rights through court oversight, and the efficient operation of systems that the legislature created to resolve disputes outside the court system. The bottom line is that reviewing courts will have to ensure oversight of algorithmic decisions is effective, without being overly intrusive.

Development and Regulatory Frameworks

[135] Mary L. Cummings, "The Social and Ethical Impact of Decision Support Interface Design", at 4; *Baker, supra* note 38.
[136] *Ibid.*
[137] *Dunsmuir, supra* note 81, para 47.
[138] Kroll et al., *supra* note 96.
[139] *Kanthasamy, supra* note 46.

Before concluding I will canvas options for the development of tribunal algorithms, and briefly suggest a couple regulatory frameworks. A backdrop to this section is the fact that Canada entered the Pan-Canadian Artificial Intelligence Strategy in 2017 and intends to be a leader in the global discussion on the range of implications of AI, including economic, ethical, policy, and legal.[140] The federal government has also announced funding for "innovation superclusters".[141] These recent developments demonstrate the current government's interest in getting more involved in stimulating growth in the AI sector and perhaps having a more hands-on role. This evident governmental enthusiasm for AI could influence the timeline and methods with which AI is developed and implemented in the public sphere.[142]

There at least five main ways these algorithms could be developed. A first is private development, a for-profit model that we see at work in AI incubators hosted currently at tech-savvy law firms like Norton Rose Fulbright.[143] A second is a social enterprise model. A public interest NGO or entity, like CanLII, could develop tribunal algorithms. As an entity that operates privately but with a public interest mandate funded by the Federation of Law Societies of Canada, CanLII is both a nimble and accountable site for tribunal algorithm development.[144] A third is for tribunal algorithms to be left to government to develop. While there are positive precedents, like the "Digital Government" initiative in Ontario, government generally does not

[140] Canadian Institute for Advanced Research, "Pan-Canadian Artificial Intelligence Strategy Overview" (30 March 2017), online: <www.cifar.ca/assets/pan-canadian-artificial-intelligence-strategy-overview/>.
[141] Government of Canada, "Canada's Innovation And Skills Plan", online: <www.budget.gc.ca/2017/docs/themes/Innovation_en.pdf>; Government of Canada, "Innovation superclusters initiative (ISI): Program guide", online: <https://www.ic.gc.ca/eic/site/093.nsf/eng/00003.html>; Treasury Board of Canada Secretariat, News Release, "Government of Canada review will ensure that innovation and clean technology programs deliver results for Canada's innovators" (6 September 2017), online: <https://www.canada.ca/en/treasury-board-secretariat/news/2017/09/government_of_canadareviewwillensurethatinnovationandcleantechno.html>.
[142] Interest in AI is also ripe at the provincial level, for instance <https://www.competeprosper.ca/uploads/2018_From_prediction_to_reality_Ontarios__AI_opportunity.pdf>.
[143] Norton Rose Fulbright, "Artificial Intelligence summit 2017" (15 November 2017), online: <http://www.nortonrosefulbright.com/knowledge/events/157194/artificial-intelligence-summit-2017>.
[144] CanLII, "About", online: <https://www.canlii.org/en/info/about.html>.

have an excellent track record of quickly developing and deploying innovative technology.[145] A fourth would involve the government contracting out development to private, non-legal firms. For example, the governing is working currently with Deloitte to examine and develop AI capabilities in administrative bodies.[146] Another hybrid option is also possible, which would be a public/private consortium. Here, algorithm development would not be located at any particular government ministry but could be heavily supported by government funds and overseen, for example, by Ministries of the Attorney General. Ontario's Ministry of Attorney General has already demonstrated an interest in emerging AI legal technology; recently, it hosted the Ontario AI Legal Challenge at the Legal Innovation Zone at Ryerson University.[147]

Governments and other regulatory entities have a role in ensuring that the use of algorithms in legal processes has socially beneficial, equitable, and rights-preserving impacts. In general, there are two main categories of regulatory challenges – *ex ante* and *post-facto.* The *post-facto* regulatory challenges arise after algorithms become available, whereas *ex ante* challenges focus on the research and development (R&D) phase. The R&D issues are not necessarily unique to algorithms (some apply to software development generally) but the potential impact of algorithmic applications merits particular concern. Matthew Scherer describes three relevant problems: 1) Discreetness, 2) Diffuseness, and 3) Opacity.[148] The "discreetness" problem is that algorithms can be developed with "limited visible infrastructure". As John McGinnis puts it, "artificial intelligence research is done by institutions no richer than

[145] Ontario Government, "Digital Government: Making government work better for people in the digital age", online: <https://www.ontario.ca/page/digital-government>.
[146] "AI-augmented government" (April 2017), Deloitte Insights, online:< https://www2.deloitte.com/insights/us/en/focus/cognitive-technologies/artificial-intelligence-government.html>.
[147] Carolyn Gruske, "Companies move forward in Ontario AI Legal Challenge", *The Lawyer's Daily* (4 January 2018), online: <https://www.thelawyersdaily.ca/articles/5581/companies-move-forward-in-ontario-ai-legal-challenge>.
[148] Matthew U. Scherer, "Regulating artificial intelligence systems: Risks, challenges, competencies, and strategies" (2016) 29:2 *Harvard Journal of Law and Technology* 369, online: <http://jolt.law.harvard.edu/articles/pdf/v29/29HarvJLTech353.pdf>.

colleges and perhaps would require even less substantial resources".[149] The rise of open-source programming, however, makes this something of an understatement (powerful algorithms can be developed in garages by pioneering students). Many current regulators are set up to deal only with, by contrast, highly visible industrial projects and energy producers. The "diffuseness" problem is that R&D teams for algorithms might be spread out across organizations, locations, and jurisdictions, with the potential to evade regulations. This suggests the need for global coordination. Finally, the "opacity" problem engages the fact that algorithmic systems are bound to be more opaque than the ones they replace, for a couple of reasons not least of which is that they manifest emergent learning. This problem will not be easy to solve, but some early work on introducing "explainer tech" into algorithmic decision-making appears to be a positive step (see the LIME project).[150] Such technology aims to patch the explanation gap between enigmatic algorithmic processing and associated outputs.

One *post-facto* solution could be that law societies require legal algorithms to be registered before they can be relied on by tribunals or courts.[151] Specific to party algorithms, the rules of professional conduct and LawPro expectations around practitioner liability may play a large part in shaping what comes before a tribunal.[152] Thus, it is fair to say that while thinking through the administrative law implications of tribunal algorithms is a useful exercise, the exact way algorithms will be permitted to play a role in these contexts will likely be guided by greater regulatory forces.

Conclusion

[149] John O McGinnis, "Accelerating AI" (2010) 104 *Nw U L Rev* 1253-1262.
[150] Marco Tulio Ribeiro, Sameer Singh, and Carlos Guestrin, "Why Should I Trust You?: Explaining the Predictions of Any Classifier" (2016), online: <https://arxiv.org/pdf/1602.04938v3.pdf>.
[151] Fritsch, *supra* note 68.
[152] *Ibid.*

The influence of AI is starting to be felt across the legal system. Now, AI is poised to assist and improve the work of public tribunals. Certain characteristics of tribunals make it likely for the implementation of AI programs to be on the reform agenda in the near future. Tribunals lack the rigid procedure of courts and aim to facilitate the efficient resolution of disputes. Tribunals also require merit-based appointments based on competencies that favour AI's "skillset", and they welcome interventions that may increase their institutional expertise. This paper explored the merits and risks of tribunals adopting the model of "AI-Supported Adjudication" (ASA). Specifically, I proposed that statutory authorization be given for AI decision support tools which provide relevant information to adjudicators but that do not make outcome recommendations. Two illustrative use cases were explored, several complications were addressed, and there was a final discussion regarding development and regulation. While some critical skepticism about the use of AI in tribunals is warranted, the benefits of a measured and closely monitored introduction of AI as supportive tools in the hands of adjudicators are ultimately more compelling.