



HOW ARTIFICIAL INTELLIGENCE WILL UNDERMINE THE LEGITIMACY OF THE GOVERNMENT OF CANADA

Major Anonymous

JCSP 49

Exercise Solo Flight

Disclaimer

Opinions expressed remain those of the author and do not represent Department of National Defence or Canadian Forces policy. This paper may not be used without written permission.

© His Majesty the King in Right of Canada, as represented by the Minister of National Defence, 2023.

PCEMI n° 49

Exercice Solo Flight

Avertissement

Les opinions exprimées n'engagent que leurs auteurs et ne reflètent aucunement des politiques du Ministère de la Défense nationale ou des Forces canadiennes. Ce papier ne peut être reproduit sans autorisation écrite.

© Sa Majesté le Roi du chef du Canada, représenté par le ministre de la Défense nationale, 2023.

CANADIAN FORCES COLLEGE - COLLÈGE DES FORCES CANADIENNES

JCSP 49 - PCEMI n° 49
2022 - 2023

Exercise Solo Flight – Exercice Solo Flight

**HOW ARTIFICIAL INTELLIGENCE WILL UNDERMINE
THE LEGITIMACY OF THE GOVERNMENT OF CANADA**

Major Anonymous

“This paper was written by a candidate attending the Canadian Forces College in fulfilment of one of the requirements of the Course of Studies. The paper is a scholastic document, and thus contains facts and opinions which the author alone considered appropriate and correct for the subject. It does not necessarily reflect the policy or the opinion of any agency, including the Government of Canada and the Canadian Department of National Defence. This paper may not be released, quoted or copied, except with the express permission of the Canadian Department of National Defence.”

« La présente étude a été rédigée par un stagiaire du Collège des Forces canadiennes pour satisfaire à l'une des exigences du cours. L'étude est un document qui se rapporte au cours et contient donc des faits et des opinions que seul l'auteur considère appropriés et convenables au sujet. Elle ne reflète pas nécessairement la politique ou l'opinion d'un organisme quelconque, y compris le gouvernement du Canada et le ministère de la Défense nationale du Canada. Il est défendu de diffuser, de citer ou de reproduire cette étude sans la permission expresse du ministère de la Défense nationale. »

HOW ARTIFICIAL INTELLIGENCE WILL UNDERMINE THE LEGITIMACY OF THE GOVERNMENT OF CANADA

PART I - INTRODUCTION

Artificial Intelligence (AI) has made significant advances in recent years, and in doing so, has become increasingly integrated into almost every aspect of society. In the Canadian context, the adoption of AI within the Government of Canada (GoC) can enhance human decision-making processes, streamline the delivery of vital services, and optimize the allocation of government managed resources. However, despite all the advances and subsequent benefits associated with integrating AI into daily governance, several risks still remain that should be both carefully considered and strategically managed. In failing to consider these risks, *the use of AI technology in daily governance could undermine the legitimacy of the GoC and result in the erosion of public trust and confidence, in both the system and the elected officials.*

This paper will explore how the use of AI in Canadian governance will benefit the GoC, while at the same time examining the risks that may undermine the legitimacy of the GoC if left unchecked. This paper will then argue how the responsible development and deployment of AI is essential to advancing the interests of the Canadian public, while maintaining public trust and ensuring that AI is used to enhance governance, vice undermine it. To achieve this, this paper will first briefly examine the history of AI, as well as briefly summarize the sources in which the GoC draws its legitimacy in governing. This will form a knowledge foundation, before examining how both subjects inter-relate to impact Canadian governance. Upon establishing this foundation, this paper will then explore the various areas of governance most vulnerable to the deployment of AI and the potential risks to be considered. This examination will be focused around three guiding questions, and framed in the context of either:

- (a) A result of the GoC's willful choice to employ AI to support daily governance; or
- (b) A result of external actors leveraging AI in an attempt to discredit the legitimacy of the GoC.

Finally, this paper will conclude by exploring some solutions that can be implemented to mitigate these risks. These solutions will be focused around the three primary stakeholders with invested interest in this problem set – the GoC, Public Industry and Academia, and the Canadian public.

PART II – BRIEF HISTORY OF ARTIFICIAL INTELLIGENCE

AI is defined as the “ability of a digital computer, or computer-controlled robot, to perform tasks commonly associated with intelligent beings”.¹ In a broader sense, the term is used to describe “the project of developing systems endowed with the intellectual

¹ B.J. Copeland, “Artificial Intelligence”. *Encyclopedia Britannica*. Accessed 24 April 2023.

processes that are characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experiences”.²

Though the concept of intelligent systems can be traced back to Greek antiquity,³ it wasn’t until the 1950s that scientists started to explore ways in which they could create machines that could imitate human thought and intelligence. In 1950, Alan Turing postulated theories supporting the concept of artificial intelligence, with his presentation of the ‘Turing Test’ in a paper called *Computing Machinery and Intelligence*,^{4,5} but it wasn’t until the Dartmouth Conference of 1956, in which John McCarthy coined the term now widely known as AI.^{6,7}

Following the Dartmouth Conference, scientists continued to explore new ways to develop AI technology until the 1980s when a recession in development was experienced due to general reductions in funding, and public expectations exceeding the abilities of the technology of the day.^{8,9} However, research in the field recovered by the 1990s, largely as a result of newly developed Machine Learning (ML) algorithms and an increasing availability in data that could be used to train these algorithms.¹⁰ Since then, there continues to be an acceleration in AI development^{11,12} and, with the availability of increasing amounts of complex data, the study of AI is expected to continue further refining both capabilities and outputs over the coming years. At present, AI has been categorized into four general categories,¹³ that better illustrate the capability limitations of each system types:

Reactive Systems – The oldest form of AI, these systems have extremely limited capabilities that are usually limited to reactions from current stimuli; they do not have the ability to ‘learn’ from previous experiences, thus limiting their function to a limited set or combination of inputs.¹⁴

² Copeland, “Artificial Intelligence”.

³ David L. Poole and Alan K. Mackworth, “Artificial Intelligence, Foundations of Computational Agents”. (New York: Cambridge University Press, 2017), 6.

⁴ Gil Press, “A Very Short History of Artificial Intelligence (AI)”. *Forbes Magazine Online*, 30 December 2016. Accessed 24 April 2023.

⁵ Rebecca Reynoso, “A Complete History of Artificial Intelligence”. *G2.com*, 25 May 2021. Accessed 24 April 2023.

⁶ Press, “Very Short History”.

⁷ James Manyika and Jacques Bughin, “The Promise and Challenge of the Age of Artificial Intelligence”. *McKinsey Global Institute*, October 2018. Accessed 24 April 2023.

⁸ Reynoso, “A Complete History”.

⁹ Sebastien Schuchmann, “History of the Second AI Winter”. *Towards Data Science*, 12 May 2019. Accessed 24 April 2023.

¹⁰ Keith D. Foote, “A Brief History of Machine Learning”. *Dataversity*, 3 December 2021. Accessed 24 April 2023.

¹¹ Manyika, “Age of Artificial Intelligence”.

¹² Reynoso, “A Complete History”.

¹³ Naveen Joshi, “7 Types of Artificial Intelligence”. *Forbes Magazine Online*, 19 June 2019. Accessed 24 April 2023.

¹⁴ Ibid.

Limited Memory Systems – Machines that, “in addition to having the capabilities of purely Reactive Systems, are also capable of learning from historical data to make decisions”.¹⁵ These systems are “trained [on] large volumes of...data...[used to] form a reference model for solving future problems”.¹⁶ It is important to note, almost all of the AI systems in use today (i.e. Machine Learning and Deep Learning systems) fall into this category.¹⁷

Theory of Mind Systems – Often referred to as next-level AI, these systems are designed to “better understand the entities it is interacting with, by discerning their needs, emotions, beliefs, and thought processes”.¹⁸ In order to move from theory to reality, this field requires advancements in multiple other disciplines that assist machines in understanding human needs.

Self-Aware Systems – Broadly referred to as the “final stage of AI development, which currently exists only hypothetically”¹⁹ through research or pop culture. As the name suggests, this field of AI represents systems that “have evolved to be so akin to the human brain, that...it will not only be able to understand and evoke emotions...but also have emotions, needs, beliefs, and potential desires of its own”.²⁰ It is within this category that society is most concerned with the evolution of AI, as a machine’s self-awareness of such emotions as self-preservation, could result in negative consequences against humanity.

PART III – PRINCIPLES OF GOVERNMENT LEGITIMACY

Much like nearly every industry, the GoC is also pursuing the use of AI in daily governance functions.²¹ However, in order to understand how AI might impact governance, it must first be understood where the GoC sources its legitimacy in governing. In its simplest form, Canada’s political system is founded upon four key principles²² that are essential to the authority and legitimacy of any presiding government:

¹⁵ Joshi, “7 Types of Artificial Intelligence”.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Government of Canada, “Responsible Use of Artificial Intelligence (AI): Exploring the Future of Responsible AI in Government”. *Canada.ca*. Accessed 24 April 2023.

²² Government of Canada, “Canadian Parliamentary System”. *House of Commons*. Accessed 24 April 2023.

Democracy – The defining trait of the Canadian governance model. Democracy represents “the sovereign will of the people, through elected and representative institutions at both the federal and provincial levels in Canada, acting within the spheres of power allotted to them by the provisions of the Constitution [and accountable to the people they serve]”.²³

Constitutionalism – The Canadian constitution is the key document to defining the architecture of government, prescribing the division of power, and ensuring the “principles of responsible government...the legitimacy of political decision-making and the exercise of legal authority” are upheld.²⁴

The Rule of Law – A system of “knowable and relatively stable, orderly and predictable body of laws which generally govern all persons equally within [Canadian] society”.²⁵ As stated by the Supreme Court of Canada, “it is the law that creates the framework within which the ‘sovereign will’ is to be ascertained and implemented”.²⁶

Human Rights – The Charter of Rights and Freedoms is the “cornerstone of human rights protection in Canada”.²⁷ Entrenched within this are the fundamental freedoms and democratic rights afforded to all, which “explicitly prohibits discrimination on the basis of colour, religion, sex, age, and physical or mental disability”.²⁸

Upholding these principles is the key to the Government’s legitimacy and authority to govern and act on behalf of the general population, ensuring the government is representative, accountable and just.

With the advancements being made in AI, the GoC is poised to leverage this emerging technology to support its governance efforts. At present, AI has sufficiently developed to support public governance in numerous ways. Advancements in data analysis tools mean the Government can leverage these tools to inform and support the development of key policies.²⁹ At the same time, faster data analysis processes can support the Government with quicker decision-making cycles, accelerating the delivery of critical support to Canadians.³⁰ With the development and deployment of intelligent

²³ Warren J. Newman, “Constitutionalism, Legality and Legitimacy: A Canadian Perspective”. (Ottawa: University of Ottawa, 2018): 3.

²⁴ Newman, “A Canadian Perspective”, 5.

²⁵ Ibid, 6.

²⁶ Ibid, 6.

²⁷ Arnando Perla, “The Canadian Charter of Rights and Freedoms”. *Canadian Museum for Human Rights*. Accessed 24 April 2023.

²⁸ Ibid.

²⁹ Danah Boyd and Kate Crawford, “Critical Questions for Big Data: Provocations for a Cultural, Technological, and Scholarly Phenomenon”. *Information, Communication & Society* 15, no. 5 (2012): 663-666.

³⁰ Ibid.

automated systems, the Government can streamline support from repetitive tasks.³¹ Finally, through the use of natural language processing tools, the Government can leverage AI to improve engagements with the public, as well as increase public awareness and accessibility to key government programs and resources.³²

Despite the fact that AI will undoubtedly improve daily governance, its use must be strategically managed, in order to maintain government legitimacy. Even though technology is primarily evolving with good intent, there continues to be a number of areas of risk, whereby the use of AI can easily compromise the legitimacy and trust in the GoC.

PART IV – RISKS TO GOVERNMENT LEGITIMACY

The following questions will form the basis for further understanding of the areas in which Government use of AI poses a risk to legitimacy:

- Will the GoC’s use of AI impact the distribution of power, both internationally and domestically?
- Will the GoC’s use of AI impact the democratic processes an institution at the centre of daily governance?
- Will the GoC’s use of AI impact public access to and/or the allocation of critical resources within society, and will this contribute to greater inequality?

Impact on the Distribution of Power

Similar to advancements with other technologies, it is reasonable to expect AI will have equally significant impacts on the distribution of power between states and non-state actors. As AI technology continues to advance, both in its capacity and overall capabilities, it will likely transform the traditional power monopolies away from resource-wealthy state actors, and empower more non-state actors who have limited access to the traditional tools of power (i.e. state economies, military forces, etc.). For the GoC, this could have both positive and negative impacts on its ability to self-govern, in particular as the impacts of AI will likely affect both domestic and international power relations concurrently.

From a domestic perspective, the implementation of AI-enabled data analytics and decision-making tools in daily governance has the benefit of expanding the GoC’s understanding of critical issues, while concurrently expediting the Government’s ability to exercise decision-making processes.³³ However, these same tools can create results

³¹ Unknown Author, “AI in Government Drives Extraordinary Possibilities”. *Intel, Government & Public Sector*. Accessed 24 April 2023.

³² Ibid.

³³ Unknown Author, “Extraordinary Possibilities”.

that evolve into normalized dependencies, or worse, become systems of entrenched biases that reinforce existing power imbalances, and are subsequently contrary to the four principles of legitimate governance. The inherent biases of AI systems are entirely dependent on the data models for which they are trained on.³⁴ If the data models reflect existing power imbalances and biases, then the resulting systems will demonstrate these same biases in their performance. As a result, these biases will lead to discriminatory outcomes that make it more difficult for marginalized communities to have their voices heard, or perhaps obstruct the advent of new voices and perspectives as society evolves³⁵ – all the while, challenging the Government’s adherence to the principles of human rights. Likewise, the increased abandonment of human involvement in the analysis and decision-making processes, compounded by the inherent opaqueness of AI systems, could make it increasingly difficult for citizens to hold their governments accountable for decisions involving critical issues.³⁶ This would become particularly relevant when involving circumstances where the automated systems, and/or the analytic outputs that support government decision-making, are unintentionally or deliberately flawed, or otherwise inconsistent with ethical norms of society. In those cases, the GoC will be hard pressed to ensure the security and welfare of all Canadians, and questions would no doubt linger as to who’s to blame, thereby challenging the Government’s adherence to the principles of democracy and constitutionalism.

From an international perspective, the GoC’s potential over-dependency on AI-enabled data analytics and decision-making tools could present avenues for exploitation by adversaries.³⁷ Intent on corrupting the GoC’s ability to make informed decisions that serve the interest of the Canadian public, these actors could ultimately humiliate the GoC by highlighting their negligence for the principles of legitimate governance; resulting in a significant impact to their authority to govern. However, this dependency on AI-enabled data analytics and decision-making tools could also be leveraged to advantage Canada’s influence in global affairs. As a traditional middle-power, with limited equities in influencing global affairs, Canada has always relied on its ability to cooperate with other states, in order to exert influence over international issues. Leveraging the aforementioned AI tools in its daily governance could provide the GoC with new ways to influence global affairs, without the need for large quantities of the traditional tools of power.^{38,39} In doing so, Canada could position itself to be a more decisive global actor, in particular with regards to both the overt and covert distribution of information and intelligence within the global commons.

³⁴ Eirini Ntoutsis et al, “Bias in Data-Driven Artificial Intelligence Systems – An Introductory Survey”. *Wiley Interdisciplinary Reviews* 10, iss. 3 (2020).

³⁵ Ntoutsis, “Bias in Data-Driven Artificial Intelligence Systems”.

³⁶ Madalina Busuioc, “Accountable Artificial Intelligence: Holding Algorithms to Account”. *Wiley Online Library, Public Administration Review* 81, iss. 5 (2020): 825-836.

³⁷ Unknown Author, “14 Ways AI Could Become a Detriment to Society”. *Forbes Magazine Online*, 14 June 2021. Accessed 24 April 2023.

³⁸ Michael C. Horowitz, “Artificial Intelligence, International Competition, and the Balance of Power”. *Texas National Security Review* 1, iss. 3 (2018).

³⁹ Ibid.

Impact on Key Democratic Processes & Institutions

In addition to impacting the distribution of power, the inclusion of AI in daily governance also risks impacting key democratic processes and institutions that define Canada. Specifically, three areas most impacted are:

- (a) The right to freedom of speech, and the inherent right to form opinions based on accessibility to true and accurate information;
- (b) The right to privacy, free from government interference and unlawful surveillance; and
- (c) The right to cast a vote in a democratically fair and transparent election process.

AI-generated misinformation is becoming increasingly prevalent in mainstream media, as it becomes easier to produce and spread throughout social media echo chambers, while also becoming more difficult to identify false narratives that are designed to disrupt public discourse.⁴⁰ By using specialized algorithms that prioritize content based on a user's preferences and prior engagements, AI can create what's referred to as filter bubbles that reinforce specific beliefs, while concurrently limiting exposure to new and differing perspectives.⁴¹ This, in turn, leads to a sense of tribalism, reinforcing social and political divisions based on false narratives.

Furthermore, these false narratives can be designed to specifically target certain groups or individuals, sowing divisions amongst neighbours and polarizing the Canadian population.⁴² This can make it more difficult to engage in meaningful dialogues to find common ground on important issues; either between the citizens and their elected officials, or amongst the citizens themselves. As a result, the GoC is continuously challenged in defending the principles of democracy and human rights, by both ensuring the protection of the freedom of speech for Canadian citizens, as well as ensuring the availability of true and accurate information, while suppressing misinformation as much as possible.

When examining how the GoC can communicate with its citizens, the use of AI-enabled media platforms can be used to deliberately shape public opinion through specially curated content; designed to control what citizens see and how they perceive their government.⁴³ Consequently, these types of manipulative (and ethically questionable) practices could result in an increase spread of misinformation. In turn, it could also lead to government-enflamed polarization of public opinion, that also raises

⁴⁰ Christopher Seneca, "How to Break Out of Your Social Media Echo Chamber". *Wired.com*, 17 September 2020. Accessed 24 April 2023.

⁴¹ Julia Haas, "Freedom of the Media and Artificial Intelligence". *Global Conference for Media Freedom*, 16 November 2020: 3-4.

⁴² Ibid.

⁴³ Ibid.

questions about privacy and freedom of speech rights. Ultimately, this will likely challenge the GoC's commitments to various principles of legitimate governance.

In addition to freedom of speech and privacy rights, the inclusion of AI in daily governance can also negatively impact the Canadian electoral process.⁴⁴ Compounding the aforementioned issues of manipulating public discourse, AI can be used to amplify certain political messages and/or support specific political candidates. More concerning is that this can be leveraged by the GoC, just as easily as it might be exploited by another state or non-state actor. When combining the effects of AI with more traditional cyber effects, it can be used to hack into voting systems and manipulate voter registration data,⁴⁵ which can potentially change the outcome of key elections or impact the results of decisive issues.⁴⁶ Collectively, these risks could undermine the GoC's commitments to the various principles of legitimate governance.

Impact on Access to and Allocation of Critical Resources

One of the greatest responsibilities of any government is the collection and management of publicly-sourced resources, intended to be redistributed based on public needs and expectations. Through this function, governments are able to influence the wellbeing of their citizens, by delivering programs and services that conform to public interest and expectations. Looking at the future of accessibility and management of these resources, there is no question AI has enormous potential to impact this function; both by ensuring access to information regarding critical resources and programs, as well as actively distributing resources through routine and emergency social programs.

In looking at the positive effects of the GoC leveraging AI to support access and allocation of government-managed resources, AI has the capacity to both streamline services, while also using analytical solutions to forecast public needs.⁴⁷ AI systems can then be leveraged to help automate routine and repetitive tasks.⁴⁸ This, in turn, can reduce the amount of time public servants spend on these tasks, or better yet, eliminate the need for a public servant to be involved at all – substantially reducing the costs on taxpayers.⁴⁹ At the same time, the use of AI-enabled analytical tools can allow the GoC to analyse large volumes of data and identify possible trends, which in turn can lead to more efficient and timely allocation of critical resources.⁵⁰ This becomes particularly valuable in times of crises, or when data patterns identify trends that allow for more predictive planning – reducing Government carrying costs, in favour of focusing on more ‘just-in-

⁴⁴ Armin Rabitsch and Rania Wazir and Thomas Treml, “Policy Paper on Artificial Intelligence’s (AI) Impact on Freedom of Expression in Political Campaign and Elections”. *Organization for Security and Cooperation in Europe* (2021).

⁴⁵ Ibid.

⁴⁶ Rabitsch, “Artificial Intelligence’s (AI) Impact”.

⁴⁷ Boyd, “Critical Questions for Big Data”, 663-666.

⁴⁸ Ibid.

⁴⁹ Ibid.

⁵⁰ Ibid.

time' solutions.⁵¹ The result of which will see better overall services for the Canadian public.

However, while the benefits can be quite obvious, there are a number of risks that are less obvious, especially to statepersons who are not familiar with how technology is both developed and deployed. In order to understand how the GoC's use of AI in daily governance can impact access to, and allocation of, resources within society, these risks can be broadly categorized into one of two categories:

- (a) How the use of AI will impact the GoC's economic and financial aspirations; and
- (b) How the use of AI will impact the GoC's social stability and equality efforts.

AI in support of daily governance has enormous potential to advance the GoC's economic and financial goals. By applying AI technology to daily governance, it can become a catalyst for economic growth and innovation; both domestically and internationally.⁵² However, two areas of vulnerability remain, that if left unaddressed, are likely to challenge the Government's legitimacy.

The first, is the possibility of job displacement, as a result of increased use of system automation in lieu of human employees.⁵³ This is particularly relevant to jobs that involve routine or repetitive tasks that can be replaced by machines with relative simplicity. While that sector may seem small and manageable today, the continuous acceleration in AI development will result in more and more jobs becoming automated,⁵⁴ as the complexity and sophistication of AI evolves. This will result in continuously increasing job losses, which ultimately conclude as either:

- (a) an increased demand for state-sponsored/assisted retraining programs, within an increasingly digital economy, in order to repurpose labour force to other vital sectors;⁵⁵ or
- (b) an increase in unemployment, which will translate to increased pressures on social welfare programs, some of which may otherwise be over-taxed.⁵⁶

With either of these conclusions, the possibility of increasing job displacement would likely result in a growing perception that the GoC either does not, or is incapable of, respecting the values of human rights presented in the Charter of Rights and Freedoms

⁵¹ Boyd, "Critical Questions for Big Data", 663-666.

⁵² Government of Canada, "Government of Canada Launches Second Phase of the Pan-Canadian Artificial Intelligence Strategy". *Innovation, Science and Economic Development Canada*. Accessed 24 April 2023.

⁵³ Ekkehardt Ernst and Rossana Merola and Daniel Samaan, "Economics of Artificial Intelligence: Implications for the Future of Work". *Sciendo* 9, iss. 1 (2019): 3.

⁵⁴ *Ibid*, 7-10.

⁵⁵ *Ibid*, 18-21.

⁵⁶ *Ibid*, 18-21.

– namely under Section 7, which guarantees the right to life, liberty and security for all persons.⁵⁷

The second, is the possibility of developing a concentration of wealth and power.⁵⁸ As AI advances, so too does the level of technical competencies required to both build and utilize this technology. As such, there is an increasing risk that the benefits of AI-enabled programs will be exploited by those with the knowledge and technical skills to understand how it is both developed and deployed – either as program beneficiaries, or as service developers/providers. Likewise, as the GoC seldom has the internal means to either develop or sustain complex technology, the function of developing, deploying and sustaining this technology will likely be outsourced to non-state actors, arguably more suited for these enduring tasks.⁵⁹ This presents a real risk that a select few companies (i.e. Alphabet, Amazon, Meta, Microsoft, etc.) will establish a monopoly in government contracts, which historically have led to increasing costs that are transferred to tax payers to sustain.⁶⁰ Concurrently, the jobs themselves will likely be sourced to labour markets that provide the most economic benefits to these companies, meaning Canadian jobs lost elsewhere.⁶¹ These issues further compound the prior issue of job displacement, and collectively, will challenge the GoC’s ability to uphold all of the principles of legitimate governance.

Similarly, while AI can be leveraged as a powerful tool to promote the GoC’s social and cultural programs, there remain significant risks that, if left unaddressed, are likely to challenge the Government’s legitimacy. Broadly speaking, these risks are the result of vulnerabilities in AI algorithms that promote biases, which can exacerbate social divisions, impede public access to critical information about support programs, or outright obstruct the fair and equitable distribution of resources to those that need it most.⁶² Of these biases, however, there are two which continuously perpetuate inequality.

First, are gender-based biases in AI algorithms.^{63,64} As previously mentioned, AI algorithms are only as effective as the data models in which they are trained on. Therefore, faulty data models will inevitably lead to faulty performance outputs. If statespersons are not aware of these biases when sanctioning the use of AI in daily governance, these algorithms will impact the GoC’s decision-making. For example, if the GoC is leveraging these tools to conduct screening of job applications or resumes in what has traditionally (based on statistics) been a male-dominated industry, AI algorithms might inadvertently discriminate against applicants who identify as anything other than

⁵⁷ Perla, “The Canadian Charter of Rights and Freedoms”.

⁵⁸ Ernst, “Economics of Artificial Intelligence”, 25.

⁵⁹ Josh Mendelsohn, “Tech Talent Can Thrive in the Public Sector but Government Must Invest in It”. *Tech Crunch*, 13 April 2021. Accessed 24 April 2023.

⁶⁰ Jennifer Carr, “Carr: How Contracting Out Hurts the Federal Government – and Canadian Taxpayers”. *Ottawa Citizen*, 23 February 2023. Accessed 24 April 2023.

⁶¹ Ibid.

⁶² Ntoutsi, “Bias in Data-Driven Artificial Intelligence Systems”.

⁶³ Ibid.

⁶⁴ Larry Hardesty, “Study Finds Gender and Skin-Type Bias in Commercial Artificial-Intelligence Systems”. *Massachusetts Institute of Technology News*, 11 February 2018. Accessed 24 April 2023.

male, by virtue of the data models it has been trained to act upon.⁶⁵ Although unintentional, this would be a significant breach of the Government's obligations to the principles of constitutionalism and human rights.

Racial-based biases in AI algorithms can have similar impact, in that they can incorrectly focus or deny services to individuals based on race.^{66,67} An example would be in the use of facial recognition algorithms, which have been proven to perform less accurately when analyzing persons of darker skin tones.⁶⁸ This can lead to discriminatory behaviours that unintentionally focuses on members of certain racial groupings. Furthermore, this can become particularly problematic when the services relate to law enforcement and border controls – whereby discriminated groups are unnecessarily spotlighted because of faulty software performance.

While these are two common examples of where AI algorithms will likely perpetuate biases in how they perform, any data model used to train AI algorithms has the potential to manifest additional biases.⁶⁹ Furthermore, data models are susceptible to changes over time,⁷⁰ and must be continuously updated to ensure optimal performance that is consistent with both the GoC and the Canadian public's expectations. If historical data is being used to train these algorithms, and they are not updated as the social circumstances evolve, this maintenance-neglect could perpetuate biases that existed in or are based on the past. Therefore, there exists a need to continuously examine these data models, in order to ensure they are up-to-date with changing social and cultural norms. Otherwise, the GoC will be implicated in a significant breach of the principles of constitutionalism and human rights.

Overall, the complexities of AI technology, in both its design and operation, can create a sort of opaqueness that make it difficult for both statespersons and the Canadian public to understand it, and therefore trust its use in daily governance. However, it is imperative that policymakers and government officials overcome this by learning to understand the technology, while at the same time carefully considering these and other risks of employing AI technology in support of daily governance. In doing so, they can then focus on the mitigation efforts necessary to ensure the Government's legitimacy and the continued trust of the Canadian public.

⁶⁵ Ntoutsis, "Bias in Data-Driven Artificial Intelligence Systems".

⁶⁶ Ibid.

⁶⁷ Hardesty, "Study Finds Gender and Skin-Type".

⁶⁸ Ibid.

⁶⁹ Ntoutsis, "Bias in Data-Driven Artificial Intelligence Systems".

⁷⁰ Ibid.

PART V – MITIGATING THE RISKS

When determining mitigation efforts, any successful solution will require the involvement of three key stakeholders within Canadian society⁷¹:

- (a) *The GoC* – as the steward of public trust and resources, obliged to operate in the interest of the Canadian public;
- (b) *Public Industry and Academia* – innovators of new technology and the lead developers of AI systems to be used by government; and
- (c) *The Canadian Public* – the client at the center of these discussions, must be aware of both risks and benefits, and understand how they can ensure accountability.

The Government of Canada

As the champion of public trust, the GoC has a crucial role in mitigating the risks associated with the use of AI within daily governance. This can be achieved by focusing Government efforts around four areas of responsibility:

- (a) Develop and implement *well-informed regulatory frameworks*;
- (b) *Promote research and development* in the field of AI;
- (c) Ensure and protect the *privacy of all citizens*; and
- (d) *Build public trust* in AI, through public education and media awareness.

As part of its responsibilities under the principles of constitutionalism and rule of law, the GoC is solely responsible for establishing clear regulations and guidelines that govern the use of AI; both in government affairs and in the general public.^{72,73} To achieve this, the Government must develop the necessary legal frameworks that will ensure transparency, accountability, and fairness^{74,75} in how it uses AI to support daily governance activities. While much work remains, the Government has made some progress by establishing the *Canada's Digital Charter*⁷⁶ and the *Directive on Automated*

⁷¹ Amy Coulterman, “Ethical AI: Why and How It Needs to Work with Communities”. *Becoming Human: Artificial Intelligence Magazine*, March 2020. Accessed 24 April 2023.

⁷² Government of Canada, “Canada’s Digital Charter”. *Innovation, Science and Economic Development Canada* (June 2022). Accessed 24 April 2023.

⁷³ Government of Canada, “Directive on Automated Decision-Making”. *Treasury Board of Canada*. Accessed 24 April 2023.

⁷⁴ GoC, “Canada’s Digital Charter”.

⁷⁵ GoC, “Directive on Automated Decision-Making”.

⁷⁶ GoC, “Canada’s Digital Charter”.

*Decision-Making*⁷⁷; both of which outline key principles in ensuring the ethical use of AI in daily governance activities.

In addition to developing legal frameworks that promote transparency, accountability, and fairness, the GoC has a responsibility to invest in research and development practices that promote the safe, ethical and beneficial use of AI technology.^{78,79} This can be achieved by remaining engaged with both industry and academic partners, in order to collaborate on solutions that ensure AI is developed and deployed in a way that is consistent with Canadian values. Furthermore, the GoC has the resources to incentivize this relationship, by providing funding in support of research initiatives that prioritize public good over financial profit.^{80,81} Parallel to this effort, the GoC can leverage this collaboration to inform and continuously improve its regulatory framework, ensuring policies remain relevant with the speed in which technology is advancing, as well as consistent with the principles of legitimate governance.

The GoC should also continue to promote ways of ensuring AI is developed in accordance with relevant privacy regulations. As part of its legal framework initiatives, the GoC can impose regulations that dictate how AI systems collect, use, store and dispose of personal data. In doing so, the GoC can ensure that AI technology recognizes and protects the privacy of all citizens. While broader privacy regulations exist already, such as the Personal Information Protection and Electronic Documents Act (PIPEDA),⁸² further work is required in order to focus these existing policies to be more explicit in cases involving AI systems.^{83, 84}

Lastly, in support of the principles of democracy and rule of law, the GoC should also be responsible for building public trust in AI systems.^{85,86} This can be achieved through two means. First, the Government can engage in public education and media awareness strategies.^{87,88} These engagements will allow industry experts to explain how AI systems work, and how the Government intends to leverage them to support the interests of the Canadian public; while also providing an opportunity for the public to engage Government and industry experts with questions and concerns. Second, the GoC can also leverage these engagements to ensure any AI systems being used are respective of all human rights. Because AI algorithms are subject to a multitude of biases, public engagements will allow for the Government, industry, and the public, to collectively work at identifying and resolving any biases in the data sets used to train AI

⁷⁷ GoC, “Directive on Automated Decision-Making”.

⁷⁸ GoC, “Canada’s Digital Charter”.

⁷⁹ GoC, “Directive on Automated Decision-Making”.

⁸⁰ GoC, “Canada’s Digital Charter”.

⁸¹ GoC, “Directive on Automated Decision-Making”.

⁸² Government of Canada, “Personal Information Protection and Electronic Documents Act”. *Department of Justice* (2000). Accessed 24 April 2023.

⁸³ GoC, “Canada’s Digital Charter”.

⁸⁴ GoC, “Directive on Automated Decision-Making”.

⁸⁵ GoC, “Canada’s Digital Charter”.

⁸⁶ GoC, “Directive on Automated Decision-Making”.

⁸⁷ GoC, “Canada’s Digital Charter”.

⁸⁸ GoC, “Directive on Automated Decision-Making”.

algorithms.^{89,90} This will reduce the potential for discriminatory results against certain groups, while concurrently building public trust in the systems, by being active participants in their development. By fulfilling all of these responsibilities, the GoC can ensure that it uses AI in a way that benefits society and aligns with Canadian values and priorities, and by extension, will protect its legitimacy to govern.

Public Industry and Academia

As leaders in the development of AI and masters of the craft, Public Industry and Academia share responsibility in mitigating the risks associated with the use of AI within daily governance. This can be achieved by focusing Public Industry and Academia's efforts around three areas of responsibility:

- (a) *Developing transparent, explainable and accountable AI systems;*⁹¹
- (b) Ensuring AI systems *do not perpetuate existing biases* or exacerbate social inequalities;⁹² and
- (c) Ensuring AI systems *respect individual privacy* and data protection.⁹³

While the GoC is ultimately responsible for remaining transparent and accountable to the Canadian public, it is Public Industry and Academia who should be charged with overseeing that AI systems are developed in a way that are transparent, explainable and accountable.⁹⁴ Transparency within AI systems implies that they must be designed in a way that allows for external scrutiny, in order to assess the accuracy of the decision-making processes employed by the systems.⁹⁵ This ensures that stakeholders, including Government officials, have sufficient understanding in how the systems operate and can identify potential flaws at the earliest possibility. Explainability is an industry term used to articulate how well an AI system's decision-making processes can be explained, using clear and understandable language.⁹⁶ This is crucial to supporting transparency, as it allows government officials (often not technologically savvy) to present details of critical systems to their stakeholders – in particular when describing flaws in the systems and how they should be corrected. Accountability refers to the creators of the AI systems, in that they can (and will be) held responsible for the functionality of their products.⁹⁷

Building on their responsibilities for accountability, Public Industry and Academia should also be responsible for ensuring AI systems do not perpetuate existing

⁸⁹ GoC, "Canada's Digital Charter".

⁹⁰ GoC, "Directive on Automated Decision-Making".

⁹¹ Corinne Cath et al, "Artificial Intelligence and the "Good Society": The US, EU, and UK Approach". *Springer Science* (2018), 509.

⁹² *Ibid*, 521.

⁹³ Cath, "Artificial Intelligence and the "Good Society", 517.

⁹⁴ *Ibid*, 509.

⁹⁵ *Ibid*.

⁹⁶ *Ibid*.

⁹⁷ *Ibid*.

biases, or exacerbate social inequalities.⁹⁸ As discussed earlier, these biases are largely introduced through the data models used to train the AI algorithms. They can be a consequence of ineffective representation of diverse data sources from today, or the misapplication of data collected in the past, which no longer represents the current state of society. Both Public Industry and Academia have the responsibility of ensuring AI is designed with these potential vulnerabilities in mind, ensuring that adequate measures are in place to neutralize the effects of these biases.⁹⁹ In collaborating with the GoC, the collective community can ensure the models used to train AI systems continuously reflect the diversity of the Canadian population.

Finally, Public Industry and Academia have a responsibility to ensure their systems respect individual privacy and data protection.¹⁰⁰ Because the effectiveness of these systems depends on their access to large quantities of data, there is a significant risk that the data could become compromised through various means of cyber activities. As the stewards of this information, Public Industry and Academia should ensure any data they control is collected, used, stored and disposed of in accordance with relevant privacy laws.¹⁰¹ In fact, industry practice shouldn't limit itself to prescribed security standards, but continuously seek ways to exceed these standards for the benefit of the public. Furthermore, Public Industry and Academia should ensure individuals retain the right and ability to access, modify, or delete any of their personal information for which they no longer wish included in the data models.¹⁰² By fulfilling all of these responsibilities, Public Industry and Academia can ensure the GoC is enabled with the ability to use AI in a manner that is both responsible and ethically consistent with Canadian values.

The Canadian Public

Finally, the Canadian public also shares responsibility in mitigating the risks associated with the use of AI systems within daily governance.^{103,104} This is to ensure the GoC abides by the principles of legitimate governance. This can be achieved by focusing the Canadian public's efforts around four areas of responsibility, which are largely complementary to the previously listed responsibilities of other stakeholders. These areas of responsibility include:

⁹⁸ Ibid, 521.

⁹⁹ Cath, "Artificial Intelligence and the "Good Society", 521.

¹⁰⁰ Ibid, 517.

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ GoC, "Canada's Digital Charter".

¹⁰⁴ GoC, "Directive on Automated Decision-Making".

- (a) *Staying informed*, regarding the use of AI in Government activities, and ensuring transparency and accountability;^{105,106}
- (b) *Becoming involved* in the development and deployment of AI systems, through consultation and discussion with the other stakeholders;^{107,108}
- (c) *Identifying and reporting* any potential biases and discrimination observed in the AI systems;^{109,110} and
- (d) *Promoting* the responsible and ethical use of AI, through participation in education and awareness-raising campaigns provided by other stakeholders.^{111,112}

By recognizing and embracing their role in the development and deployment of AI systems in daily governance, the Canadian public can ensure their elected officials remain faithful to the principles of legitimate governance.

PART VI – CONCLUSION

In conclusion, this paper examined how *the use of AI technology could undermine the legitimacy of the GoC, resulting in the erosion of public trust and confidence in both the system and the elected officials*. This examination was primarily achieved by exploring the various areas of governance which will be vulnerable during the deployment of AI, and understanding the associated risks that must be considered. Finally, this paper concluded by examining the various responsibilities of key stakeholders, essential to mitigating the risks identified.

In his message for Third Artificial Intelligence for Good Summit, the United Nations Secretary-General, Antonio Guterres, said:

“Artificial Intelligence brings...improved access to health care, accelerated economic development and other gains. But...also...dangers: a world with diminished privacy, less human agency accountability...where income inequality widens and access to work narrows for millions....To harness the benefits of Artificial Intelligence and address the risks, we must all work together – governments, industry, academia and civil society”.¹¹³

By committing to the responsible development and deployment of AI, the Government of Canada can ensure its actions remain in the interests of the Canadian population, and in doing so, will ensure the necessary public trust in support of their legitimate governance.

¹⁰⁵ GoC, “Canada’s Digital Charter”.

¹⁰⁶ GoC, “Directive on Automated Decision-Making”.

¹⁰⁷ GoC, “Canada’s Digital Charter”.

¹⁰⁸ GoC, “Directive on Automated Decision-Making”.

¹⁰⁹ GoC, “Canada’s Digital Charter”.

¹¹⁰ GoC, “Directive on Automated Decision-Making”.

¹¹¹ GoC, “Canada’s Digital Charter”.

¹¹² GoC, “Directive on Automated Decision-Making”.

¹¹³ United Nations, “Secretary-General’s Message for Third Artificial Intelligence for Good Summit”. *UN.org*, 28 May 2019.

It is only by doing this can they ensure the Government of Canada remains legitimate, capable of meeting the needs of Canadian society as technology continues to evolve.

BIBLIOGRAPHY

Danah Boyd and Kate Crawford, “Critical Questions for Big Data: Provocations for a Cultural, Technological, and Scholarly Phenomenon”. *Information, Communication & Society* 15, no. 5 (2012): 663-666.

Madalina Busuioc, “Accountable Artificial Intelligence: Holding Algorithms to Account”. *Wiley Online Library, Public Administration Review* 81, iss. 5 (2020): 825-836.

Corinne Cath et al., “Artificial Intelligence and the “Good Society”: The US, EU, and UK Approach”. *Springer Science* (2018): 509.

Jennifer Carr, “Carr: How Contracting Out Hurts the Federal Government – and Canadian Taxpayers”. *Ottawa Citizen*, 23 February 2023.

B.J. Copeland, “Artificial Intelligence”. *Encyclopedia Britannica*. Accessed 24 April 2023.

Amy Coulterman, “Ethical AI: Why and How It Needs to Work with Communities”. *Becoming Human: Artificial Intelligence Magazine* (2020).

Ekkhardt Ernst and Rossana Merola and Daniel Samaan, “Economics of Artificial Intelligence: Implications for the Future of Work”. *Sciendo* 19, iss. 1 (2019): 3.

Keith D. Foote, “A Brief History of Machine Learning”. *Dataversity* (2021).

Unknown, “14 Ways AI Could Become a Detriment to Society”. *Forbes Online Magazine*, 14 June 2021.

Government of Canada, “Canada’s Digital Charter”. *Innovation, Science and Economic Development Canada* (2022).

Government of Canada, “Canadian Parliamentary System”. *House of Commons*.

Government of Canada, “Directive on Automated Decision-Making”. *Treasury Board of Canada*.

Government of Canada, “Government of Canada Launches Second Phase of the Pan-Canadian Artificial Intelligence Strategy”. *Innovation, Science and Economic Development Canada*.

Government of Canada, “Personal Information Protection and Electronic Documents Act”. *Department of Justice* (2000).

Government of Canada, “Responsible Use of Artificial Intelligence (AI): Exploring the Future of Responsible AI in Government”. *Canada.ca*.

Julia Haas, “Freedom of the Media and Artificial Intelligence”. *Global Conference for Media Freedom*, 16 November 2020: 3-4.

Larry Hardesty, “Study Finds Gender and Skin-Type Bias in Commercial Artificial-Intelligence Systems”. *Massachusetts Institute of Technology News*, 11 February 2018.

Michael C. Horowitz, “Artificial Intelligence, International Competition, and the Balance of Power”. *Texas National Security Review* 1, iss. 3 (2018).

Unknown, “AI in Government Drives Extraordinary Possibilities”. *Intel, Government & Public Sector*.

Naveen Joshi, “7 Types of Artificial Intelligence”. *Forbes Online*, 19 June 2019.

James Manyika and Jacques Bughin, “The Promise and Challenge of the Age of Artificial Intelligence”. *McKinsey Global Institute*, October 2018.

Josh Mendelsohn, “Tech Talent Can Thrive in the Public Sector but Government Must Invest in It”. *Tech Crunch*, 13 April 2021.

Warren J. Newman, “*Constitutionalism, Legality and Legitimacy: A Canadian Perspective*”. (Ottawa: University of Ottawa, 2018): 3.

Eirini Ntoutsi et al., “Bias in Data-Driven Artificial Intelligence Systems – An Introductory Survey”. *Wiley Interdisciplinary Reviews* 10, iss. 3 (2020).

Arnando Perla, “*The Canadian Charter of Rights and Freedoms*”. *Canadian Museum for Human Rights*.

David L. Poole and Alan K. Mackworth, “*Artificial Intelligence, Foundations of Computational Agents*”. (New York: Cambridge University Press, 2017), 6.

Gil Press, “A Very Short History of Artificial Intelligence (AI)”. *Forbes Magazine Online*, 30 December 2016.

Armin Rabitsch and Rania Wazir and Thomas Tremml, “Policy Paper on Artificial Intelligence’s (AI) Impact on Freedom of Expression in Political Campaign and Elections”. *Organization for Security and Cooperation in Europe* (2021).

Rebecca Reynoso, “A Complete History of Artificial Intelligence”. *G2.com*, 25 May 2021.

Sebastian Schuchmann, “History of the Second AI Winter”. *Towards Data Science*, 12 May 2019.

Christopher Seneca, “*How to Break Out of Your Social Media Echo Chamber*”. *Wired.com*, 17 September 2020.

United Nations, “Secretary-General’s Message for Third Artificial Intelligence for Good Summit”. *UN.org*, 28 May 2019.