



AI IN THE RESEARCH FUNDING SYSTEM

The academic research funding system involves a series of decisions by researchers, academic institutions, and granting agencies. As a decision-making technology, artificial intelligence (AI) will likely have an impact on who and what gets funded in Canada. AI can be deployed to improve the process in many ways, but its misuse may come with unintended negative consequences.



SETTING THE RESEARCH AGENDA

AI could spot high-impact trends but miss emerging opportunities.

AI may assist in determining research priorities, designing funding opportunities, and identifying areas where funding could optimize Canadian R&D outputs for predicted high impact.



Using AI to determine research priorities may create a feedback loop, where more researchers will work in the fields of predicted high impact (potentially at the expense of investigator-driven research).



PRE-SCREENING, ELIGIBILITY REVIEW, AND PRE-PEER REVIEW

AI may be used to more efficiently screen funding applications for compliance with eligibility, formatting standards, and plagiarism.

AI could streamline time-consuming administrative tasks that are prone to human error, and prevent peer-reviewers from making decisions based on unconscious biases rather than scientific merit.



AI may inherit biases from biased datasets, and may not be able to detect nuances in applications that could impact eligibility, leading to faulty decision-making.



PEER REVIEW

AI may be used to assign peer reviewers for funding applications, predict research impact, or reduce the time burden of peer review.

AI can identify connections among scientists, screen for potential conflicts of interest, and may be better at predicting the impact of the proposed research than humans or current indicators (e.g., citation count).



AI decision-making needs to consider expertise and diversity to not exacerbate the marginalization of traditionally under-represented groups in the research system.



GRANT AND AWARD DECISION MAKING

AI may be used to inform or make final decisions about awarding funding.

AI can manage high volumes of data, process data quickly and accurately, and help to remove incompleteness, error, and bias in the research funding cycle.



If the AI system is a "black box", funding decisions informed or made by AI may raise concerns about transparency, fairness and explainability.



POST-GRANT MANAGEMENT

AI and its applications may help move research forward and monitor research progress.

Use of AI may improve research data storage, management standards, and practices to protect scientific integrity for grant recipients.



Complexity and opacity of certain types of AI systems raise questions about whether users will be able to understand or explain innovative findings or novel designs produced by these systems.

Research funding is a complex process of balancing political, economic, and scientific interests to determine whether to provide funding and in what fields. Advances in AI have the potential to transform the nature of scientific inquiry and lead to innovations in science and engineering.