Algorithmic Impact Assessment Results

Version: 0.10.0

Project Details

1. Name of Respondent
Tristan Bentley-Michaud, Jerome Lau, Colton Blackwell

2. Job Title
Developer(s)

3. Department
Natural Sciences and Engineering Research Council

4. Branch
Private Sector Contractor

5. Project Title
SFU Computing Science Admissions Management System

6. Project ID from IT Plan
N/A

7. Departmental Program (from Department Results Framework)
N/A

8. Project Phase
Design [Points: 0]

9. Please provide a project description:
Developing and deploying an initial viable version of an admissions management system for the School of Computing Science at Simon Fraser University, a Public Reasearch University in British Columbia

About The System

10. Please check which of the following capabilities apply to your system.
Text and speech analysis: Analyzing large data sets to recognize, process, and tag text, speech, voice, and make recommendations based on the tagging
Risk assessment: Analyzing very large data sets to identify patterns and recommend courses of action and in some cases trigger specific actions
Process optimization and workflow automation: Analyzing large data sets to identify and anomalies, cluster patterns, predict outcomes or ways to optimize; and automate specific workflows
Image and object recognition: Analyzing very large data sets to automate the recognition, classification, and context associated with an image or object.
Content generation: Analyzing large data sets to categorize, process, triage, personalize, and serve specific content for specific contexts

Section 1: Impact Level : 2

Current Score: 60

Raw Impact Score: 60

Mitigation Score: 30

Section 2: Requirements Specific to Impact Level 2

Peer review

Consult at least one of the following experts and publish the complete review or a plain language summary of the findings on a Government of Canada website:

- qualified expert from a federal, provincial, territorial or municipal government institution
- qualified members of faculty of a post-secondary institution
- qualified researchers from a relevant non-governmental organization
- contracted third-party vendor with a relevant specialization
- a data and automation advisory board specified by Treasury Board of Canada Secretariat.

OR

Publish specifications of the automated decision system in a peer-reviewed journal. Where access to the published review is restricted, ensure that a plain language summary of the findings is openly available.

Gender-based Analysis Plus

Ensure that the Gender-based Analysis Plus addresses the following issues:

- impacts of the automation project (including the system, data and decision) on gender and/or other identity factors;
- planned or existing measures to address risks identified through the Gender-based Analysis Plus.

Notice

Plain language notice posted through all service delivery channels in use (Internet, in person, mail or telephone).

Human-in-the-loop for decisions

Decisions may be rendered without direct human involvement.

Explanation

In addition to any applicable legal requirement, ensure that a meaningful explanation is provided to the client with any decision that results in the denial of a benefit or service, or involves a regulatory action. The explanation must inform the client in plain language of:

- the role of the system in the decision-making process;
- the training and client data, their source, and method of collection, as applicable;
- the criteria used to evaluate client data and the operations applied to process it;
- the output produced by the system and any relevant information needed to interpret it in the context of the administrative decision; and

- a justification of the administrative decision, including the principal factors that led to it.

Explanations must also inform clients of relevant recourse options, where appropriate.

A general description of these elements must also be made available through the Algorithmic Impact Assessment and discoverable via a departmental website.

Training

Documentation on the design and functionality of the system.

IT and business continuity management

None

Approval for the system to operate

None

Other requirements

The Directive on Automated Decision-Making also includes other requirements that must be met for all impact levels.

Link to the Directive on Automated Decision-Making

Contact your institution's ATIP office to discuss the requirement for a Privacy Impact Assessment as per the Directive on Privacy Impact Assessment.

Section 3: Questions and Answers

Section 3.1: Impact Questions and Answers

Reasons for Automation

1. What is motivating your team to introduce automation into this decision-making process? (Check all that apply)
Improve overall quality of decisions
The system is performing tasks that humans could not accomplish in a reasonable period of time
Use innovative approaches

2. What client needs will the system address and how will this system meet them? If possible, describe how client needs have been identified.
Provide applicants to the SFU School of computing science an interface for submitting applications with the additional data the school requires.
Provide admissions reviewer an interface for viewing automatically ranked applications and allowing them to provide feedback on applications to refine rankings while maintaining final say in acceptance and rejection of applicants.
Provide admissions committee a naturalistic way so setting admissions requirements without being con

3. Please describe any public benefits the system is expected to have.

System aims to increase quality of admission to SFU computing science. This is intended in the longer term to leading to more productive researchers for the university to conduct more computing science research for the public benefit.

4. How effective will the system likely be in meeting client needs?
Very effective [Points: +0]

5. Please describe any improvements, benefits, or advantages you expect from using an automated system. This could include relevant program indicators and performance targets.
Workflow for application processing by reviews stays similar to previous system.
Make admissions decisions fairer and more equitable for applicants and reflective of their background, education, and personality.
Allow the admission committee to make and change requirements in an intuitive and non-technical manner that is independent of the changing situation in lower education.

6. Please describe how you will ensure that the system is confined to addressing the client needs identified above.
Define use cases for the minimum viable product
Consult internal and external stakeholders for the admissions management system and establish their values.
Compare and contrast values to identify conflicts between stakeholders.
Prioritize value conflicts to be addressed.
Make a requirements specification that addresses the value-driven design considerations, functional requirement, technical requirements, and scope limitations for the minimum viable product.

7. Please describe any trade-offs between client interests and program objectives that you have considered during the design of the project.
Ethical Considerations:

Ensuring Inclusive Fairness in Admissions
The challenge lies in addressing academic standards while avoiding the reinforcement of socio-economic disparities. The

admissions process must evolve to be inclusive of diverse student backgrounds without sacrificing the quality of education

at SFU.
2. Building Trust in AI Processes
Ensuring that AI is used transparently and ethically in the admissions process is critical. The system must be designed to maintain human oversight, which will help foster trust while preventing biases inherent in automated systems.

Safeguarding Applicant Privacy
To enhance transparency without violating privacy laws, SFU must ensure that sensitive applicant data is protected. This includes using secure systems for data processing and finding ways to disclose relevant information without risking exposure of private details.

User Considerations:
Applicants will be required to submit more data than they were under the previous system.
Reviewer will not have complete knowledge of the ranking process
The admissions committee will have to submit more data and take an overall more proactive approach to maintain admissions standards

8. Have alternative non-automated processes been considered?
Yes [Points: +0]

9. If non-automated processes were considered, why was automation identified as the preferred option?
The Admissions Committee and their reviewing staff are limited in resources and time that are available to process admissions. More data is required from applicants to the school to make informed admissions decisions but manually comparing many personal datapoints and responses from applicants in a considerate manner is not within the current skillset or time limitations admissions reviewers. It is also not possible in a timely manner for the school leadership to create comprehensive processes for determine the importance of various personal details as part of admissions requirements.

10. What would be the consequence of not deploying the system?
Service quality is not as high [Points: 0]
Service cannot be delivered in a timely or efficient manner [Points: +2]
Service delivery cannot achieve performance targets [Points: 0]

Risk Profile

11. Is the project within an area of intense public scrutiny (e.g. because of privacy concerns) and/or frequent litigation?
Yes [Points: +3]

12. Are clients in this line of business particularly vulnerable?
No [Points: +0]

13. Are stakes of the decisions very high?
No [Points: +0]

14. Will this project have major impacts on staff, either in terms of their numbers or their roles?
Yes [Points: +3]

15. Will the use of the system create or exacerbate barriers for persons with disabilities?
No [Points: +0]

Project Authority

16. Will you require new policy authority for this project?
No [Points: +0]

About the Algorithm

17. The algorithm used will be a (trade) secret
Yes [Points: +3]

18. The algorithmic process will be difficult to interpret or to explain
Yes [Points: +3]

About the Decision

19. Please describe the decision(s) that will be automated.
Numerical ranking of applicants, converting personal data into machine readable format, retraining of an AI model for new admissions requirements, informing applicants of acceptance or rejection.

20. Does the decision pertain to any of the categories below (check all that apply):
Other (please specify) [Points: +1]

21. Please describe
Post-Secondary Education (Application to University)

Impact Assessment

22. Which of the following best describes the type of automation you are planning?
Partial automation (the system will contribute to administrative decision-making by supporting an officer through assessments, recommendations, intermediate decisions, or other outputs) [Points: +2]

23. Please describe the role of the system in the decision-making process.
Comparing profiles of imaginary applicants with defined suitability against profiles of real applicants to assign those profiles a suitability value that they are ranked on.

24. Will the system be making decisions or assessments that require judgement or discretion?
Yes [Points: +4]

25. Please describe the criteria used to evaluate client data and the operations applied to process it.
Submitted profiles contain an applicant's following information:

High school transcripts with:
Name
Gender
Photo
Phone number
Birthdate
School district
School name
School address
Nationality
Self-reported ancestry
Essay question responses
Hobbies

With these values bundled together in a machine-readable format, the applicant profile is compared by an AI assistant against virtual profiles of imaginary students that also have all the above information defined and additionally, a defined suitability value as a percentage.

Bundled into applicant profile which is compared against virtual

26. Please describe the output produced by the system and any relevant information needed to interpret it in the context of the administrative decision.
Suitability values as percentages which are used to rank applicants by how closely they align with the admissions committee's an ideal SFU computing science student.

27. Will the system perform an assessment or other operation that would not otherwise be completed by a human?
No [Points: +0]

28. Is the system used by a different part of the organization than the ones who developed it?
Yes [Points: +4]

29. Are the impacts resulting from the decision reversible?
Reversible [Points: +1]

30. How long will impacts from the decision last?
Some impacts may last a matter of months, but some lingering impacts may last longer [Points: +2]

31. Please describe why the impacts resulting from the decision are as per selected option above.
The decision will allow individuals to enroll at a post-secondary institution which will take years to complete a degree at and possibly effects long-term career opportunities for the applicant.

If the system cannot evaluate suitability of candidates, it risks reputational damage to SFU Computing science

32. The impacts that the decision will have on the rights or freedoms of individuals will likely be:
Little to no impact [Points: +1]

33. Please describe why the impacts resulting from the decision are as per selected option above.
The decision to apply to SFU computing science is a personal choice and the school leadership has the right to evaluate potential students on the criteria they see fit to use.

34. The impacts that the decision will have on the equality, dignity, privacy, and autonomy of individuals will likely be:
Little to no impact [Points: +1]

35. Please describe why the impacts resulting from the decision are as per selected option above.
The decision will not affect an individual's equality, dignity, privacy, or autonomy in the public realm. They suffer no consequences in public if they are accepted or rejected by SFU

36. The impacts that the decision will have on the health and well-being of individuals will likely

be:
Moderate impact [Points: +2]

37. Please describe why the impacts resulting from the decision are as per selected option above.
The decision to allow an individual to enroll at the given post-secondary institution can affect an individual's mental health given their acceptance or rejection.

38. The impacts that the decision will have on the economic interests of individuals will likely be:
High impact [Points: +3]

39. Please describe why the impacts resulting from the decision are as per selected option above.
The decision will allow for the enrollment at a post-secondary institution which will affect education and therefore limits of career attainment and stability.

40. The impacts that the decision will have on the ongoing sustainability of an environmental ecosystem, will likely be:
Little to no impact [Points: +1]

41. Please describe why the impacts resulting from the decision are as per selected option above.
Algorithm make not decisions about the environment.

About the Data - A. Data Source

42. Will the Automated Decision System use personal information as input data?
Yes [Points: +4]

43. Have you verified that the use of personal information is limited to only what is directly related to delivering a program or service?
No [Points: +4]

44. Is the personal information of individuals being used in a decision-making process that directly affects those individuals?
Yes [Points: +2]

45. Have you verified if the system is using personal information in a way that is consistent with: (a) the current Personal Information Banks (PIBs) and Privacy Impact Assessments (PIAs) of your programs or (b) planned or implemented modifications to the PIBs or PIAs that take new uses and processes into account?
No [Points: +1]

46. What is the highest security classification of the input data used by the system? (Select one)
None [Points: +0]

47. Who controls the data?
Private Sector / NGO [Points: +3]

48. Will the system use data from multiple different sources?

Yes [Points: +4]

49. Will the system require input data from an Internet- or telephony-connected device? (e.g. Internet of Things, sensor)
No [Points: +0]

50. Will the system interface with other IT systems?
Yes [Points: +4]

51. Who collected the data used for training the system?
Your institution [Points: +1]

52. Who collected the input data used by the system?
Your institution [Points: +1]

53. Please describe the input data collected and used by the system, its source, and method of collection.
Input Data:
High school transcripts with:
Name
Gender
Photo
Phone number
Birthdate
School district
School name
School address
Nationality
Self-reported ancestry
Essay question responses
Hobbies

Source: Applicants to the university
Method of collection: Online questionnaire

About the Data - B. Type of Data

54. Will the system require the analysis of unstructured data to render a recommendation or a decision?
No [Points: 0]

Section 3.2: Mitigation Questions and Answers

Consultations

1. Internal Stakeholders (federal institutions, including the federal public service)
No [Points: +0]

2. External Stakeholders (groups in other sectors or jurisdictions)
Yes [Points: +1]

3. Which External Stakeholders will you be engaging?
Academia

Civil Society
Clients or their Representatives
Other (describe)

4. Please describe
Students

De-Risking and Mitigation Measures - Data Quality

5. Will you have documented processes in place to test datasets against biases and other unexpected outcomes? This could include experience in applying frameworks, methods, guidelines or other assessment tools.
No [Points: +0]

6. Will you be developing a process to document how data quality issues were resolved during the design process?
Yes [Points: +1]

7. Will you be making this information publicly available?
Yes [Points: +1]

8. Will you undertake a Gender Based Analysis Plus of the data?
No [Points: +0]

9. Will you be making this information publicly available?
No [Points: +0]

10. Have you assigned accountability in your institution for the design, development, maintenance, and improvement of the system?
Yes [Points: +2]

11. Will you have a documented process to manage the risk that outdated or unreliable data is used to make an automated decision?
Yes [Points: +2]

12. Will you be making this information publicly available?
No [Points: +0]

13. Will the data used for this system be posted on the Open Government Portal?
No [Points: +0]

De-Risking and Mitigation Measures - Procedural Fairness

14. Will the audit trail identify the authority or delegated authority identified in legislation?
Yes [Points: +1]

15. Will the system provide an audit trail that records all the recommendations or decisions made by the system?
Yes [Points: +2]

16. Will all key decision points be identifiable in the audit trail?

Yes [Points: +2]

17. Will all key decision points within the automated system's logic be linked to the relevant legislation, policy or procedure?
No [Points: +0]

18. Will you maintain a log detailing all of the changes made to the model and the system?
Yes [Points: +2]

19. Will the audit trail clearly set out all decision points made by the system?
Yes [Points: +1]

20. Could the audit trail generated by the system be used to help generate a notification of the decision (including a statement of reasons or other notification) where required?
Yes [Points: +1]

21. Will the audit trail identify precisely which version of the system was used for each decision it supports?
Yes [Points: +2]

22. Will the audit trail show who the authorized decision-maker is?
Yes [Points: +1]

23. Will the system be able to produce reasons for its decisions or recommendations when required?
No [Points: +0]

24. Will there be a process in place to grant, monitor, and revoke access permission to the system?
Yes [Points: +1]

25. Will there be a mechanism to capture feedback by users of the system?
Yes [Points: +1]

26. Will there be a recourse process planned or established for clients that wish to challenge the decision?
No [Points: +0]

27. Will the system enable human override of system decisions?
Yes [Points: +2]

28. Will there be a process in place to log the instances when overrides were performed?
Yes [Points: +1]

29. Will the audit trail include change control processes to record modifications to the system's operation or performance?
Yes [Points: +2]

30. Will you be preparing a concept case to the Government of Canada Enterprise Architecture Review Board?
Yes [Points: +1]

De-Risking and Mitigation Measures - Privacy

31. If your system uses or creates personal information, will you undertake or have you undertaken a Privacy Impact Assessment, or updated an existing one?
No [Points: +0]

32. Have you undertaken other types of privacy assessments for your automation project? Please describe any relevant efforts.
Consultation with university stakeholders

33. Will you design and build security and privacy into your systems from the concept stage of the project?
Yes [Points: +1]

34. Will information be used within a closed system (i.e. no connections to the Internet, Intranet or any other system)?
Yes [Points: +1]

35. If the sharing of personal information is involved, has an agreement or arrangement with appropriate safeguards been established?
Yes [Points: +1]

36. Will you de-identify any personal information used or created by the system at any point in the lifecycle?
No [Points: +0]