

Canadian Postsecondary Education and AI Ethics

This article provides an overview of key findings from an environmental scan conducted by the We Count team in May 2020. The scan relied on information available through online sources to explore how data ethics are being taught, expressed, and implemented within Canada by three stakeholders in the data ecosystem: Postsecondary Education (PSE) Institutions, Data Service Providers, and AI Firms.

The PSE portion of the environmental scan identified 46 AI-related programs across 29 Canadian PSE institutions and aimed to answer the following questions: Is AI ethics and fairness included in program curriculums? Do any programs address minority groups or outliers?

Highlights

- 30 of 48 identified programs include an ethics course*
- 17 of 48 identified programs require students to enroll in an ethics course
- 11 of 48 identified programs tackle algorithmic bias, fairness, and social issues**
- 3 of 48 identified programs address minority issues

*Including broader ethical topics such as privacy, security and cybercrime

**Including required and elective courses

Examples of Ethical AI Courses

University of British Columbia

[Master of Data Science](#)

[Master of Data Science in Computational Linguistics](#)

Course:

DSCI 541: Privacy, Ethics, & Security

Course Description:

The legal, ethical, and security issues concerning data, including aggregated data. Proactive compliance with rules and, in their absence, principles for the responsible management of sensitive data. Case studies on privacy, human dignity, harm, the public good, legal issues, the role of ethics boards, and consent.



Simon Fraser University

Master of Science in Data Science

Course:

CMPT 3120: Social Implications

Course Description:

An examination of social processes that are being automated and implications for good and evil, that may be entailed in the automation of procedures by which goods and services are allocated. Examination of what are dehumanizing and humanizing parts of systems and how systems can be designed to have a humanizing effect.



Queen's University

Master of Management Analytics

Course:

AI Ethics & Policy

Course Description:

This course explores the profound implications of AI on business and society. The ethical and policy issues linked with the application of AI in business are covered in-depth, including such issues as overcoming the job displacement due to AI by job creation, ensuring the public good as AI pervades the new economy, and balancing privacy and transparency in AI related endeavors.



University of Toronto

Master of Applied Computing in Data Science

Course:

CSC2541H: AI and Ethics — Mathematical Foundations and Algorithms

Course Description:

Machine learning systems are becoming increasingly important in many domains where they are used to make predictions and decisions that often have life-altering consequences. As these systems are becoming ubiquitous, it is important to address issues of privacy, fairness and accountability. Most of the course will focus on algorithmic fairness.



York University

[Master of Management in Artificial Intelligence](#)

[Master of Business Analytics](#)

Course:

PHIL 5340: Ethics and Societal Implications of Artificial Intelligence

Course Description:

This course is intended for students with professional interest in the social and ethical implications of AI. Topics include theoretical issues (could AI ever have moral rights?), practical issues (algorithmic bias, labor automation, data privacy), and professional issues (tech industry social responsibility).



University of Western Ontario

[Graduate Specialization in Artificial Intelligence](#)

Course:

CS 9622: Nonfunctional Software Requirements — Safety, Accessibility, & Sustainability

Course Description:

As we increasingly create a society where people have to interact with various automated systems, we need to be concerned about whether these systems could cause personal harm. More generally, there is the need to learn to design computer systems that are not implicitly biased in favor of one portion of the population over another.



University of Waterloo

[Master of Data Science in Artificial Intelligence](#)

[Master of Mathematics in Data Science](#)

Course:

CS 798: Artificial Intelligence Law, Ethics, and Policy

Course Description:

Students must complete a 3-day workshop on Ethics in Data Science & Artificial Intelligence; alternatively, students can opt for CS 798: Artificial Intelligence Law, Ethics, and Policy.

Ontario Tech University

[Bachelor of Science in Data Science](#)

Course:

CSCI 4040U: Ethics, Law, and the Social Impacts of Computing



Course Description:

The development of laws and social mechanisms has not kept pace with the rapid development of computing. The impact that computing has on society will be examined in light of the need for professional ethics and appropriate laws and regulatory agencies.

Takeaways

- Most AI education is through computer science or data science specializations at all PSE degree levels, including continuing studies
- The majority of ethical courses that address social implications and fairness are at the graduate level
- AI ethics is not showing as a priority across programs, with only 17 out of 48 requiring ethics training
- Bias and minority concerns are not addressed often, even in programs with ethics courses

Assessing Inclusionary Practice in Canadian Data Services

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The Data Service Provider portion of the environmental scan identified 27 companies with operations in Canada and aimed to answer the following questions: Who are the most popular data service providers in Canada? What is the main messaging regarding their service approaches? How are they addressing bias management and inclusion?

Highlights

- 20 of 27 identified companies are US/EU based with operations in Canada
- 11 of 27 identified companies reference bias management
- 5 of 27 identified companies address inclusion or disability

A diverse space

Companies usually offer a combination of services, such as provision, analysis, and software services. As such, companies were categorized into five classes:

Classification	Description	Examples	% of Identified Companies
Data Exchange	A marketplace where data sets are purchased from data providers, usually in raw formats. This is where 2nd and 3rd party data are purchased.	AWS Data Exchange	4%
Data Provider	Any company that wishes to sell its data directly or on a data exchange.	InfoCanada, Cleanlist, Direct Lead Data	11%
Data & Insight Provider	Offer 3rd party data sets and help curate and convert them into insights based on client needs.	Pelmorex, Experian, AggregateIQ	19%
Data Research & Intelligence Partner	Conduct their own research, such as surveys and focus groups. May also collect and curate data. Companies in this space usually have a client-facing consultative practice.	Kantar, Ipsos, Vividata	22%
Data Solutions	Offer a combination of data services, such as a data management platform (DMP), data exchange, data sets, analytic toolkits, data onboarding, and business services.	Adobe Audience Manager, Liveramp, Salesforce	44%

It is worth noting that 85% of the identified companies help interpret and make sense of the data they provide (Data & Insight Providers, Data Research & Intelligence Partners, Data Solutions).

Examples of company messaging

Most of website messaging is targeted towards potential clients and focuses on better ROI, conversion, and decision-making:

“Getting the edge on your competition isn’t just about moving ahead. It’s about digging down and making sense of your data.”

— Adobe Audience Manager

“It is our expertise at extracting models and analytical insights from this data that enables us to drive revenue for your business.”

— InfoCanada

“We are on a mission to help organizations leverage the power of our data and identity solutions to deliver innovative products.”

— Liveramp

“We have a deep commitment to evidence-based decision-making for one reason, to help you achieve results.”

— Environics Analytics

Examples that address fairness and inclusion

Nielsen: In a [2019 article](#), Nielsen CEO David Kenney stated that the company employs trusted and fair data science principles, spending millions to ensure that every person is represented in measurements. Moreover, Nielsen has [conducted studies and published reports](#) on consumers with disabilities, some of which are available in Braille.

Ipsos: In an [article](#) that details the characteristics and risks of Big Data, Ipsos declared that they are careful not to mistake size for representativeness in data sets. Ipsos also published a [study on home access for people with disabilities in the UK](#).

Salesforce: Salesforce’s [dedicated webpage on AI ethics](#) communicates their stance of ensuring that AI is safe and inclusive for all. To achieve this, Salesforce tests models with diverse data sets, and has hired a [Chief Ethical and Humane Use Officer](#) to develop a strategic framework for the ethical and humane use of technology.

Neustar: Neustar [communicated the findings](#) of a Federal Trade Commission report on inclusion and exclusion of Big Data, and addressed questions that marketers should consider in regards to the representativeness, accuracy, bias, and fairness of the data they use.

Maru/Blue: The company boasts reliable and representative insights through their [patient ailment communities](#), which provide access to information on people with very specific health concerns.

Takeaways

- Clients often expect help interpreting data; bias awareness is a needed skill for data service providers
- Most Data Service Provider messaging is focused on appealing to traditional business values (ROI, conversion, better decision-making)
- Data privacy and consent are the most common ethical concerns addressed; inclusion is rarely mentioned
- A proactive stance on inclusion and ethics by data service providers can help educate clients on its business values
- Data Management Platforms that automate data science functions can support inclusion if the platforms are designed inclusively from the start

Addressing Inclusionary Practice in Canadian AI Firms

This article provides an overview of key findings from an environmental scan conducted by the We Count team in May 2020. The scan relied on information available through online sources to explore how data ethics are being taught, expressed, and implemented within Canada by three stakeholders in the data ecosystem: Postsecondary education (PSE) Institutions, Data Service Providers, and AI Firms.

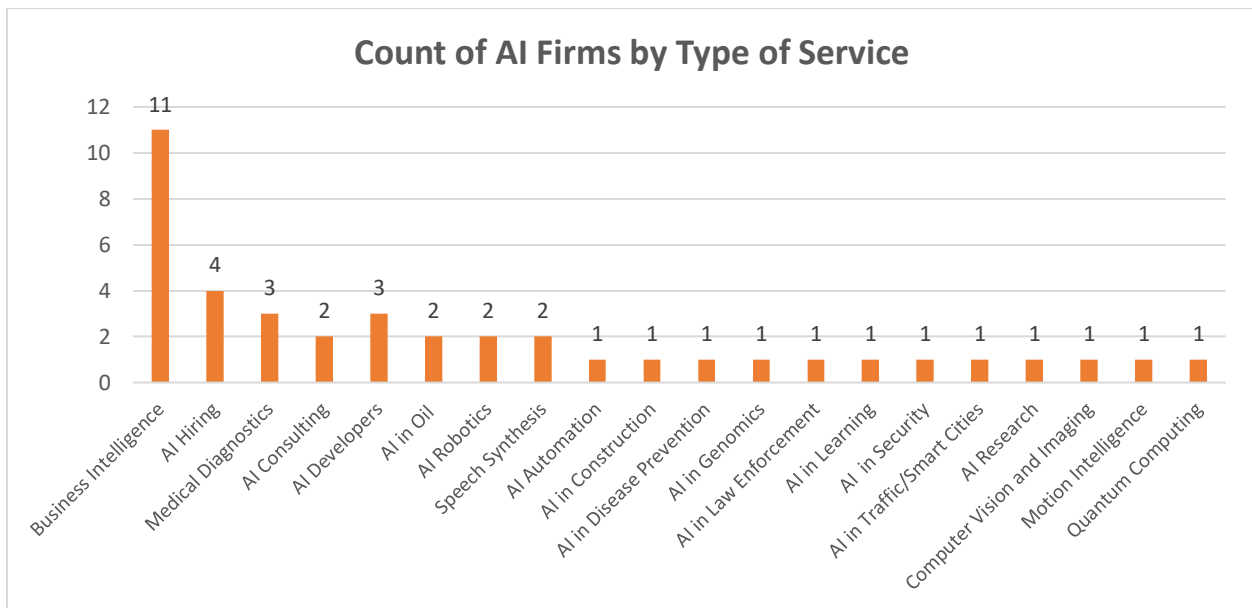
The AI Firm portion of the environmental scan identified 40 Canadian AI Firms and aimed to answer the following question: What is the main messaging communicated by popular AI companies?

Highlights

- 16 of the 40 identified AI firms address ethical concerns
- 9 of the 40 identified AI firms address issues of fairness or inclusion

A focus on business needs

A considerable amount of identified AI Firms provide clients with services that fulfil business needs, such as providing business intelligence and aiding in the hiring process. The chart below details the types of services provided by the identified AI Firms.



Examples of company messaging

Many websites position AI as a benefit and solution to human limitations:

“Our AI enablement tools save you time in the necessary steps of labelling data and training AI models.”

— Element AI

“We know the complexities of dermatology can be daunting, so we’ve developed a tool to provide you with an instant second opinion.”

— Triage

“Use your humans wisely, automate with ADA.”

— ADA

“4x more accurate than traditional selection methods at matching people to jobs where they thrive.”

— Plum.io

Examples that address fairness and inclusion

Element AI: The company’s [page on responsibility](#) communicates a proactive approach of “putting our own house in order first” and actively contributing to the development of ethical AI.

Plum.io: Ultraviolet, the company’s proprietary recruitment and talent selection AI is [stated to account for varying types of ability](#) to not have an adverse impact on protected groups.

Coveo: An [article published on the company’s website](#) argues for a human-driven approach to AI. The article characterizes AI as not being immune from error due to biases in data, algorithms, and interaction.

Stradigi AI: In 2019, Stradigi AI [appointed futurist and tech entrepreneur will.i.am as AI Advisor, Bias and Ethics](#) to help create AI products that empower people.

Omnia AI (Deloitte): Published a [report on Canada’s AI imperative](#) that recommends taking into account inclusion and fairness in AI development.

Accenture: Provides AI strategy consulting that takes into account AI ethics and recently published a [research report](#) that describes how an inclusive approach to algorithm design helps in reducing societal harm.

PWC: [Provides AI strategy consulting services](#) that assess the ethical nature of AI firms and helps them test for bias and fairness.

Aversan Labs: Produces a smart personal detection device that relies on ultrasonic wave technology to assist the visually impaired in their day to day tasks.

Aerial Technologies: Uses AI along with motion detection to provide noninvasive eldercare monitoring solutions.

Takeaways

- Business needs (intelligence and hiring) make up the largest category of AI firms
- Majority of website messaging positions AI as a benefit and solution to human limitations
- Canadian AI firms may be beginning to acknowledge the importance of fairness and inclusion in AI