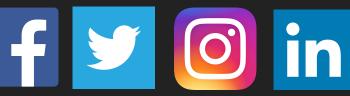# AI FUNDING IN CANADA

Canada's Major Artificial Intelligence Research Cities

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CANADIAN FUNDING

Though researchers in Canada have struggled in the past with access to funding, the story has changed for artificial intelligence. While many other countries were not yet pursuing this field, AI researchers in Canada were able to access funding for projects dedicated to artificial intelligence that were viewed dependent upon their potential for the future.

A short two years ago the federal government pledged $125 million for a national artificial intelligence strategy, to keep Canada relevant in the AI international community. The Pan-Canadian AI Strategy is the first of its kind – as Canada leads the world in developing the first national AI strategy. The Pan-Canadian AI Strategy, administered by CIFAR, is intended to foster collaboration between researchers in Canada's major cities.

The strategy is full-force ahead as Canada's major cities continue to gain more traction by establishing startups, headquarters, institutes and centers.

Companies such as Adobe Systems Inc, LG Electronics Inc and Uber Technologies, to name a few, have already set up AI centers in major Canadian cities.

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CIFAR'S FOUR MAJOR GOALS

1. To increase the number of outstanding AI researchers and skilled graduates in Canada

2. To establish interconnected nodes of scientific excellence in Canada's three major centers for artificial intelligence: Edmonton, Montreal and Toronto

3. To develop global thought leadership on the economic, ethical, policy and legal implications of advances in AI

4. To support a national research community on AI

RESULTS EXPECTED

- Enhance Canada's international profile in AI research and training

- Increase the productivity of AI academic research

- Increase collaboration in AI nationally and internationally

- Attract and retain talent in the workplace

MAJOR CANADIAN RESEARCH CITIES

MONTREAL

The roots of AI research and the collaborative model is something that sets Montreal apart from other technology hubs. The atmosphere of AI in Montreal is focused on the fellowship and belief that scientific progress should be for everyone – and a foundation to share knowledge.

La Belle Ville, a main city in Montreal, has research roots that spread across the world. Top AI researchers have engaged with Montreal's academic programs, including Hugo Larochelle of Google Brain, and have left and come back to grow privately-funded AI labs.

Rooted in the fact that other pioneer researchers, such as Yoshua Bengio, Geoffrey Hinton and Yann Lecun, kept research at a fire when deep learning theories on neural network operations continued to fall and halt research in the early days of AI. This fact helps give Montreal the power of strength in recruiting AI researchers.

Montreal's AI research network has drawn global interest and talent. In 2016, machine learning researchers from University of Montreal and McGille University established a new institute: Montreal's Institute for Learning Algorithms (MILA). MILA is in institute that facilitates and democratizes access to talent and research for applied AI in the business sector.

But MILA isn't the only institute that's housed in Canada, or even Montreal. The Computer Research Institute of Montreal (CRIM) is another that acts as a bridge between university research and business needs – and has been doing so since 1985 and has collaborated on AI projects for nearly 30 years.

IVADO, Montreal's Institute for Data Valorization, fills the supply and demand gap faced by MILA and CRIM by raising awareness of machine learning and operations knowledge through membership programs.

The three institutes of Montreal have curated an innovation network of more than 70 partners including Montreal players in transportation, energy, commerce and healthcare.

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Because Montreal is such a key player for AI there has been an influx of AI applications and AI focused businesses:

- **Element AI,** co-founded in 2016 by Jean-Francois Gagne and Yoshua Bengio. The team has quickly grown to 300 employees over the past two years and is the largest privately-owned Canadian AI R&D lab.

- **Microsoft** acquired Montreal AI lab, Maluuba, in early 2017 with plans to double technical experts to 75 over the next two years.

- **Samsung Electronics' Advanced Institute of Technology** (SAIT) opened an AI lab in the Université de Montréal in August 2017. SAIT has been collaborating with Bengio and other partners from the University of Toronto, McGill University and NYU since 2014.

- **Google Brain** recruited former student of Bengio and Montreal native, Hugo Larochelle, in mid-2017, to run their AI research in Montreal.

- **Facebook** established FAIR Montreal in late 2017 and hired Joelle Pineau (a McGill University Professor of Computer Science) to head this lab. FAIR is hiring 10 researchers initially and plans to triple in size by the end of 2018.

- **DeepMind,** acquired by Google in 2014, announced the opening of a research lab in Oct 2017 headed by Doina Precup (McGill University Professor of Computer Science).

- **Thales SA,** announced plans to open a lab in Montreal in October 2017. They are currently members of IVADO and plan to partner with MILA. By mid-2019, they hope to expand to 50 AI scientists.

- **The Royal Bank of Canada** will open a Borealis AI lab in 2018. They aim to have ten researchers on staff in the first year.

Canadian and Quebec governments and other international corporations are playing a huge role in funding Montreal's research organizations, as well as with recruitment and retention of talent in Canada.

Government support (federal, provincial, and municipal):

- In September 2016, the Canada First Research Excellence Fund allocated: $84 million to McGill University for their Healthy Brains for Healthy Lives (HBHL) initiative and $93.5 million to Université de Montréal for Optimization of Deep Learning and Knowledge sharing (IVADO)
- In March 2017, $40 million was allocated to Montreal from the Government of Canada's $125M Pan-Canadian AI Strategy, administered by the Canadian Institute for Advanced Research (CIFAR).
- In spring 2017, $100 million was allocated by the Government of Quebec for the creation of a provincial wide cluster and institute for Artificial Intelligence
- In March 2018, the Government of Quebec communicated the grant of: $5 million toward the establishment of an international organization on artificial intelligence and $10 million toward NEXT.AI and CDL, initiatives of HEC Montreal, over the next five years

Multinational support (corporate and philanthropic):

- In 2016, Google announced it would give $3.33 million USD over three years to the MILA
- In early 2017: Microsoft contributed $7 million USD to McGill University and Université de Montréal AI Labs
- In August 2017: MILA was awarded $2.4 million USD research grant from the US-based Open Philanthropy Project, to make AI safer for society

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TORONTO

Toronto is the largest city in Canada with a population of close to 6.5 million people. The city is rich in cultural diversity and is highly economically diversified – home to Toronto Stock Exchange, headquarters to five of Canada's largest banks and many large Canadian and multinational corporations. It's easy to say that Toronto is the major center for AI research. In the past year there were more new tech jobs added in the Toronto region than New York City and San Francisco Bay area combined.

Like Montreal, Toronto is the home of two AI institutes: the Canadian Institute for Advances Research which creates and maintains research networks that bridge knowledge gaps globally and Vector Institute for Artificial Intelligence that acts as a magnet to attract and retain the talent needed to advance research and accelerate commercialization and applications of AI across Canada.

Vector Institute has funding commitments of $135 million over the next five years.

Ontario's nature of fellowship within universities and institutes has led to disruptive breakthroughs in technology. The University of Toronto is among the top computer science programs globally, with top professors that include pioneer researchers – Geoffrey Hinton and Yann LeCun.

By creating strong communication links between research, innovation and commercialization within and beyond the province, Ontario has generated more opportunities for talent and harnessed local and foreign investment to fuel the communication and collaboration to expand global applications of AI.

In last years budget alone; Ontario allocated $350 million to push the development of key transformative technologies to build a broader foundation. Toronto is now home to more than 275 AI startups, a growing number of which have raised substantial funding from international VC's and is one of the best places globally to launch a career in Artificial Intelligence.

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Waterloo is another city in the Ontario region that is a home to artificial intelligence. The Waterloo Artificial Intelligence Institute, launched in March of 2018, acts as a portal for organizations to access researcher expertise for commercial applications of AI. It formalized relationships across eight of the university's research centers and 24 of its research labs. The Center for Pattern Analysis and Machine Intelligence (CPAMI), another institute, recently developed an AI augmented camera system that can identify texting, talking, and distracted drivers. CPAMI hopes to develop a similar driver behavior recognition system that tracks eye movements to warn sleepy drivers.

The University of Waterloo is another university among the top computer science programs, globally. It's become a hot spot on the PanCanadian AI Strategy map and known as Toronto's "AI twin" devoted to applied research. DarwinAI is the most recent startup in Waterloo. It's based in the Accelerator Centre in the David Johnston Research and Technology Park. They've raised $3 million from Obvious Ventures, iNovia Capital and angel investors at the Creative Destructive Lab in Toronto. DarwinAI explains to users how and why AI software's made a decision and made a technological breakthrough in the area of neural networks. The investment was made to launch the platform in early 2019.

RECENT INVESTMENTS IN TORONTO

- **Uber –** announced plans to invest more than $200 mill over five years as it opens an engineering office and expands its self-driving car center

- **OpenText** – new flexible AI platform that combines open source machine learning with advanced analysis to acquire, merge, manage and analyze big data

- **Thomson Reuters** – opened a new Toronto technology center to house their cognitive computing activities

- **General motors** – committed to growing its engineering workforce in Markham to 1000 to focus on autonomous vehicle software

- **NVIDIA** – announced plans to open an AI research facility to explore novel approaches to deep learning

- **Etsy** – chose Toronto as the location for it's newest machine learning center of excellence

- **Samsung** – opened a new R&D office which focuses on strengthening collaborative research with world-leading scholars in the AI field

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EDMONTON

Artificial intelligence in Edmonton is based off a community-driven group building a business ecosystem for AI and machine learning-based products and services.

The city of Edmonton, the government of Alberta, local businesses and startups AI initiatives is to create meaningful products and services using cutting-edge AI technology. The want is to provide post-secondary students, the general public and eventually k-12 student with the knowledge and resources of AI.

The Alberta Machine Intelligence Institute (AMII) is a world leader in the fields of machine intelligence, artificial intelligence and reinforcement learning.

AMII currently focuses on commercial opportunities and bringing the startup mindset to its world.

The University of Alberta, located in Edmonton, is ranked second in the world for AI and machine learning research – behind Tsingshua University in China. The University of Alberta is best know to have led the way in AI fields as computers beating the best humans in checkers, poker and Go.

DeepMind Ltd, Google's high profile AI research firm announced that it's to open it's first lab outside the United Kingdom in Edmonton. Demis Hassabis, CEO, said in a blog entry that they chose Edmonton for a specific purpose. "It was a big decision for us to open our first non-UK research lab," Hassabis wrote. "The fact that we're doing so in Edmonton is a sign of the deep admiration and respect we have for the Canadian research community."

OTHER EDMONTON IA-RELATED NEWS

- **Nov. 15, 2018** – The Canadian Federal Government invests $2.5 Million in an AI-Supercomputing hub for academic and industry collaboration at the University of Alberta.

- **Oct. 16, 2018** – MIT invests $1 Billion USD (Yes Billion) in an AI-focused university, to meet the demand for AI-related tech talent.

- **April. 10, 2018** – ATB invests $940,000 through a four-year partnership at the University of Alberta, to create real-world banking solutions and applications for real Albertans.

- **Jan. 30, 2018** – DeepMind announces they are funding an endowed chair position in the University of Alberta's Department of Computing Science.

- **July. 17, 2017** – DeepMind opens first ever international AI research office in Edmonton, Alberta, Canada, in close collaboration with the University of Alberta.

- **Nov. 20, 2017** – $1.6 Million CAD five-year funding deal between Servus Credit Union and the University of Alberta, to support AI-related research.

With millions of dollars being funneled into Canada for AI research it's easy to see why and how Canada is remaining one of the top players in the game for artificial intelligence. Although Canada is in the early stages of its new funding from CIFAR, the future of AI research depends on the continued funding and government policy.

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SOURCES

https://www.theglobeandmail.com/canada/education/canadian-university-report/article-canadian-ai-research-depends-on-continued-funding/

https://medium.com/believing/canadas-artificial-intelligence-ecosystem-4798b0517016

https://torontoglobal.ca/AI

http://www.digitaljournal.com/tech-and-science/technology/toronto-is-now-a-global-technology-powerhouse-for-ai-startups/article/523870

https://medium.com/syncedreview/new-institute-for-applied-ai-opens-in-waterloo-afc35992cbf8

https://www.therecord.com/news-story/8912472-waterloo-startup-darwinai-aims-to-make-ai-smarter/

http://edmonton.ai/

https://edmontonjournal.com/business/local-business/david-staples-edmonton-leading-way-in-artificial-intelligence-research

https://www.cbc.ca/news/canada/edmonton/artificial-intelligence-deepmind-edmonton-google-research-1.4195026

http://www.eedc.ca/edmonton-continues-to-flex-its-ai-muscles/

https://www.cybera.ca/news-and-events/tech-radar/introducing-the-ai-initiative-albertas-artificial-intelligence-knowledge-source/

https://www.cifar.ca/ai/pan-canadian-artificial-intelligence-strategy

https://www.investinontario.com/spotlights/10-ai-companies-watch-2018

https://www.itworldcanada.com/ai/listing-category/companies/

https://www.nanalyze.com/2018/07/top-10-ai-startups-canada/