

# DRIVING ONTARIO'S AI INNOVATION ECOSYSTEM

As artificial intelligence (AI) continues to transform how we live and work, Ontario's universities are at the forefront of AI training and innovation – transforming industries and strengthening the economy. Through cutting-edge research, key partnerships and world-class talent development, universities are advancing AI solutions that are shaping everything from health care and life sciences to agriculture and business.

Ontario is a global leader in AI, home to visionary talent such as the University of Toronto's Professor Emeritus Geoffrey Hinton, Canada's newest Nobel laureate and the "godfather of AI." Decades ago, Hinton demonstrated the power of deep learning and neural networks, the foundation for modern AI advancements. Today, thanks to this legacy, U of T excels in training tomorrow's AI leaders and advancing AI research across a range of areas like advanced biomedicine, robotics, engineering, sustainable materials development and autonomous vehicle design – among many others.

The Pan-Canadian AI Strategy, launched in 2017, further catalyzed talent and research in Ontario, supporting the region to become a top global hub for AI innovation. U of T's commercialization ecosystem is a key driver of capital and talent attraction, attracting more than \$14 billion in capital, creating 20,000 jobs at 1,500 startups, including 200+ AI startups. These companies include global leaders such as Blue J Legal, Waabi and Ada.

Below are more examples of the many ways Ontario's universities are advancing AI, driving change, and helping position the province at the forefront of innovation.



## Key Facts

- According to AUTM data, from 2021 to 2023, 12 Ontario universities reported **2,321 invention disclosures** resulting in an impressive **1,033 new patent applications** and a **26% increase in startups** over the 3-year period.
- According to the Vector Institute, nearly **80,000 AI jobs** were created in Ontario between 2019 to 2025, and **70 new AI startups** were founded in 2024-25.
- AI is an engine of economic growth in Ontario with nearly **\$9.8 billion** in venture capital investments in AI between 2019 to 2025, according to the Vector Institute.
- Ontario universities are leading the development of AI talent, with nearly **5,000 new AI master's graduates** between 2019 to 2025, according to the Vector Institute.

## ● Building the AI talent of the future

● An AI-powered experiential learning platform is being used by **Algoma University's** Career and Experiential Education department to help boost student's career skills. InStage is a cutting-edge tool that creates realistic conversational simulations, helping students sharpen their presentation skills and stand out in a competitive job market.

● To help students apply AI tools and concepts to real-world scenarios and explore its impact on future roles across various industries, **Brock University's** AI Essentials course equips students with a comprehensive understanding of AI, its capabilities, challenges and ethical considerations. With hands-on experience in Large Language Models and AI tools, students gain valuable skills to succeed in a changing AI job market.

● By exploring topics like AI in health care, security, arts and culture, to its groundbreaking applications across industries, **Lakehead University's** Artificial Intelligence: Applications & Implications lecture series equips students with both theoretical insight and practical awareness to navigate an AI-driven world. Guest speakers from diverse fields share their expertise to empower learners to thoughtfully apply AI knowledge in their studies, careers and everyday lives.

● To equip international post-graduate students with in-demand skills in emerging fields such as data analytics, high-performance computing, AI, and digital humanities, **Nipissing University's** Post-Baccalaureate Diploma broadens career opportunities and prepare graduates for success in today's tech-driven, interdisciplinary workforce.

● With AI and digital platforms reshaping how we work, **University of Ottawa's** Learning Futures Fund supports professor-led initiatives that integrate innovative teaching methods and students' digital fluency, fostering a dynamic, future-ready learning environment. Projects range from personalized learning platforms to courses that bridge gaps in digital skills and critical thinking.

● To gain a deeper understanding of AI and how to implement this cutting-edge technology into their careers, **Trent University's** Applied Artificial Intelligence postgraduate certificate program equips students with the interdisciplinary AI knowledge and practical skills that are increasing in demand across industries. It also covers machine learning, programming, and the ethical and societal impacts of AI, preparing students to integrate AI into their careers responsibly and effectively.

● To help meet a rising demand for engineers in automation and intelligent systems, the **University of Windsor's** new Mechatronic Systems Engineering program offers two high-demand specializations: autonomous vehicles and intelligent manufacturing. With hands-on training in AI, machine learning, and computer vision, students will gain the skills needed to lead advancements in robotics, smart manufacturing and emerging technologies.

● By harnessing the power of generative AI to make education more accessible, **Wilfrid Laurier University's** Design for Change UX Challenge brings together students to tackle real-world barriers in learning. Guided by expert mentors in AI, education and human-centered design, students turn their classroom knowledge, research skills and lived experience into innovative, inclusive solutions – empowering a future of more equitable education for all.

## ● Industry partnerships that fuel AI innovation

● To promote responsible AI governance in the cultural sector with the use of generative AI, The Cultural Policy Hub at **OCAD University** has joined forces to drive policy discussions, develop artist-focused toolkits, and host expert roundtables that bring together representatives from across the cultural industries and policymakers who are at the forefront of AI governance and regulation. This partnership facilitates dialogue and future policy directions that promote cultural and technological innovation.

● In the second phase of Project Arrow, **Ontario Tech University** is propelling Canada's vision for zero-emission mobility in partnership with the Automotive Parts Manufacturers' Association. Arrow 2.0 is more than a prototype — it's a proving ground for artificial intelligence and machine learning integrated into next-gen electric vehicle design. With advanced sensors and smart systems enhancing safety, performance and environmental sustainability, the project exemplifies how strategic industry-academic collaboration can accelerate Canada's leadership in AI-driven transportation innovation.

● The CareAI project leverages the power of generative artificial intelligence to improve both patients' and healthcare providers' experiences in digital platforms. Led by Calabrio Canada and developed in partnership with **Queen's University**, ORX, and WELL Health Technologies, the initiative received funding from DIGITAL (Canada's Supercluster Initiative) and industry partners. The project aims to address challenges such as the need for reliable reporting mechanisms, reducing errors in data entry and providing 24/7 services like patient scheduling and nursing triage.

● CHARTWatch, an AI-powered early warning system developed at Unity Health Toronto is revolutionizing patient care. The tool, developed in partnership with the **University of Toronto**, monitors hospitalized patients in real-time, identifying when their risk of unexpected mortality increases and alerts doctors and nurses to urgently intervene. An evaluation of the tool's deployment at St. Michael's Hospital found it reduced the risk of unexpected hospital deaths by 26 per cent. The tool is now available to more than 30 hospitals across Ontario, highlighting AI's transformative role in medicine.

● Using AI to enable rapid cancer diagnosis, a **University of Waterloo** professor, in collaboration with Princess Margaret Hospital, is developing a tool that can identify brain and spine cancer types in just ten seconds. This innovation has the potential to support real-time decision-making during surgery — giving surgeons immediate, accurate information to guide treatment and improve patient outcomes.

● With a goal to improve access to life-saving therapies and make clinical trials more effective, a **York University** professor is using AI to transform how patients engage with chronic condition research. By partnering with global digital health company RxPx, the "AI clinical buddy system" boosts patient recruitment, adherence, and participation — bringing critical treatments to more people, faster.



## ● From AI research to real-world impact

● To strengthen Ontario's energy grid and cut fossil fuel use, a **Carleton University** researcher is using AI to make wind and solar energy more predictable. Deep learning algorithms analyze physics and geospatial data to forecast power output and improve grid planning. The team is also evaluating if current infrastructure can handle rising electricity demand, especially from EVs — highlighting the need for urgent upgrades.

● A smart robot developed at The Robotics Institute at the **University of Guelph** called: Guelph Intelligent Greenhouse Automation System (GIGAS), is using AI-powered vision and a cutting-edge grip to harvest tomatoes with precision. Designed to tackle agricultural labour shortages and difficult greenhouse working conditions, GIGAS is revolutionizing agricultural automation.

● To make housing faster, smarter and more accessible in Northern Ontario, a **Laurentian University** team is developing an AI-based robotic system that could revolutionize affordable housing. Using machine vision, the prototype homebuilder can identify building panels, position them accurately, and avoid obstacles — speeding up construction with minimal human input. By combining advanced design, robotics, smart materials, and fabrication techniques, the project aims to streamline the building process and reduce costs.

● From fighting superbugs to tackling climate change, **McMaster University**'s interdisciplinary AI research is delivering solutions with global impact. Stoked Bio is developing next-generation antibiotics, Resilio Climate Solutions uses digital twins to manage climate risks, HARVEST Systems provides a scalable, cost-effective way to recycle waste heat and cut emissions, and the e-Sim Bus project helps transit agencies plan electric bus fleets.

● To better diagnose lung disease in women, a **Toronto Metropolitan University** researcher is using AI models to improve diagnosis and health outcomes for women with Chronic Obstructive Pulmonary Disease (COPD). By developing machine learning prediction models that can determine COPD status based on computed tomography imaging, the goal is to improve detection, accuracy and prediction of who is at risk of developing COPD and provide treatment options. The research also provides a new, more accessible way to diagnose COPD.

● To help doctors deliver more precise radiation therapy for lung cancer, a **Western University** student has developed an AI-powered tool that helps medical teams quickly predict how radiation will spread in the lungs when targeting multiple tumours. The AI program allows clinicians to efficiently estimate, compare, and refine treatment plans, making it easier to personalize care and minimize damage to healthy tissue.

