UNIVERSITY OF TORONTO | Engineering

INNOVATION

INDUSTRY PARTNERSHIPS
WITH U of T ENGINEERING

120

engineering Chairholders and Professorships, including Canada Research Chairs and Industry Research Chairs

19

buildings encompass U of T Engineering's footprint, including our Institute for Aerospace Studies located 15 km north of campus and biomedical engineering laboratories in MaRS Discovery District

#1

engineering school in Canada

400+

engineering-focused industry partners worldwide

3RD

best city in the world "to live and work in tech," ahead of Silicon Valley, Los Angeles and Boston

10

hospital partners in the Greater Toronto Area

260+

engineering faculty members

500

startups launched by U of T entrepreneurs in the last five years

$1.3B

in annual funded research across U of T and our partner hospitals

$15M

investment made by the Government of Ontario in the Myhal Centre for Engineering Innovation & Entrepreneurship to strengthen Ontario's innovation corridor

$15.7B

injected into the Canadian economy per year as a result of U of T's research impact

2,000+

research agreements signed by U of T with external partners each year

MESSAGE FROM THE DEAN

Engineering drives innovation. New technologies strengthen product development, but they also have the potential to disrupt existing business models and create entirely new ones.

As Canada's top-ranked engineering school and among the world's best, we have a proven track record in leveraging the power of collaboration to address complex challenges, launch new ventures and improve the quality of life for people around the world.

Our researchers pursue groundbreaking discoveries across all sectors, from mining and sustainable energy to bioengineering and artificial intelligence. Through our global network of partnerships, we translate these innovations from the lab to the marketplace, generating more than 100 invention disclosures, patent applications and spinoff companies annually.

More than 400 companies and organizations from around the world partner with us to extend their R&D capacity and gain a competitive edge. We offer our partners unprecedented insight into where their industry is headed, and early access to the innovations that will shape them in the years to come. We are adept at leveraging external investments through generous matching programs at the provincial and federal levels, multiplying their impact up to threefold.

We are also a global hub for talent, attracting the best and brightest from around the world. Through our innovative educational programs — including our flagship Professional Experience Year Co-op Program and a rich suite of experiential learning opportunities — we nurture the next generation of engineering leaders.

Situated in the Discovery District, at the heart of one of North America's largest and most vibrant cities, we are a critical anchor of Ontario's innovation corridor. Our world-class infrastructure — wet labs, microfabrication facilities, robotics testing areas and much more — recently received more than $30 million in upgrades. In 2018, we opened the doors to our newest building, the Myhal Centre for Engineering Innovation & Entrepreneurship. This landmark facility is catalyzing exciting new collaborations through its flexible design studios, makerspaces and prototyping facilities.

U of T Engineering is where the future is being shaped today. Let's work together to make it even brighter.

CHRIS YIP
Dean, Faculty of Applied Science & Engineering

Christopher Yip holds the Decanal Chair in Innovation at U of T Engineering. Before becoming the Faculty's 14th Dean he held positions as the University of Toronto's associate vice-president of global partnerships as well as the director of the Institute for Biomaterials & Biomedical Engineering. Yip is a leading scholar in the field of single-molecule biophysics and has served as the vice chair of the Canadian Institutes of Health Research (CIHR) Institute of Genetics Advisory Board as well as on grant panels at the Natural Sciences and Engineering Research Council, CIHR and the U.S. National Institutes of Health. He is a Fellow of the American Association for the Advancement of Science (2009) and of the Engineering Institute of Canada (2014).

Does your organization want to gain a competitive edge in R&D or attract top employees? PARTNERING WITH U of T ENGINEERING WILL HELP YOU ACHIEVE YOUR VISION. The power of partnership adds tremendous value to your research, drives technology development and commercialization, and maximizes your impact.

"To grow, thrive and compete, we need to develop and produce more innovative and complex products. That requires a new type of design engineer who can work across disciplines in an integrated team environment and adapt to technological change. U of T Engineering creates that kind of engineer."

TODD YOUNG
Vice President & General Manager,
Head of QSeries Aircraft Program & Interim Head of
Customer Services, Bombardier Commercial Aircraft

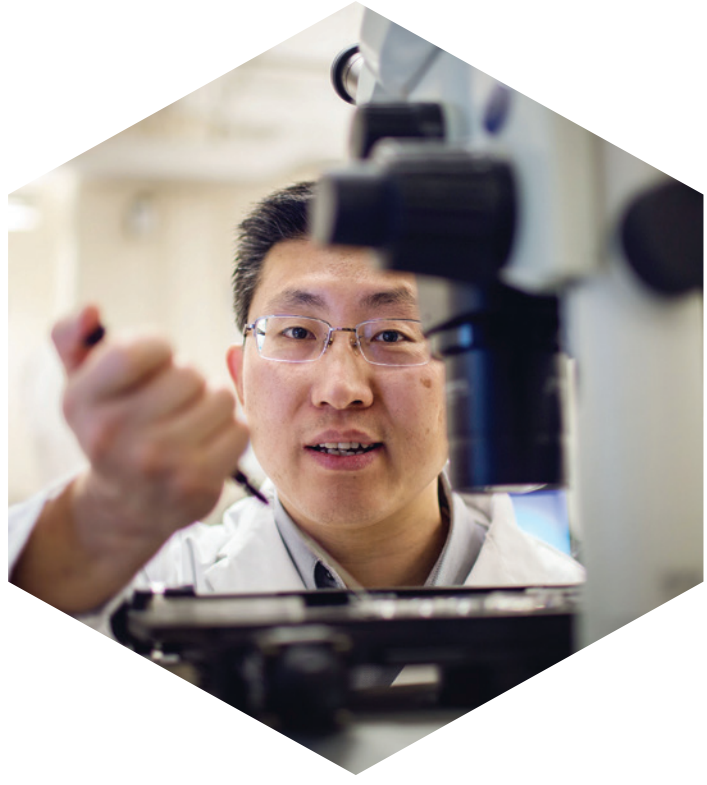
"IBM's partnership with U of T is incredibly important. We've done a lot of great work together on projects that foster high-value jobs, help create new businesses and positively impact IBM, the University and the broader community."

ALLEN LALONDE
Senior Innovation Executive Director,
IBM Canada R&D Centre

"It is fascinating and important to see what we can do by working together on some of the broader challenges. Our relationship with U of T Engineering has been very important and we look forward to continuing this work with the University."

CHRIS ANDREWS
Senior Vice President, EllisDon

REASONS TO PARTNER WITH U of T ENGINEERING



RECRUIT OUR TOP TALENT

Exceptional students from around the world choose U of T Engineering to help them become leaders in their fields. They study with world-renowned professors and gain invaluable experience working directly with industry through work-experience programs, mentorships and project-based learning — resulting in professionals poised to address the diverse challenges facing your company.

TAP INTO OUR BREADTH OF EXPERTISE

Partnership with U of T Engineering brings unparalleled access to a research community defined by excellence, ingenuity and creative trailblazing. This includes leveraging more than 25 leading-edge engineering research hubs that represent our six Innovation Clusters: Advanced Manufacturing, Data Analytics & Artificial Intelligence, Human Health, Robotics, Sustainability and Water. When you collaborate with us, you also tap into a rich ecosystem of more than 10,000 research, teaching and clinical faculty members across the entire University.

MAXIMIZE YOUR ROI

Did you know that every dollar you invest toward the direct cost of research at U of T Engineering can be multiplied up to six-fold? Your investment goes further when you partner with us. We leverage financial support from industry with federal, provincial and matching programs to enable millions of dollars in industry-partnered research every year. The bottom line on being our partner: you achieve the greatest possible scope, impact and ROI on joint projects.

BENEFIT FROM OUR PRIME LOCATION

With companies like Uber, Samsung and Google expanding their operations in Toronto, it's no wonder the city ranks in the top 10 globally for innovation and opportunity. We leverage our prime location, collaborating with our neighbours: world-class hospitals and major multinational corporations headquartered here. Being located in the nation's financial capital and a North American hub for information and communication technology is the perfect place for Canada's #1 engineering school.

CLEAR AND BALANCED INTELLECTUAL PROPERTY (IP) TERMS

U of T has a simple and balanced approach to IP. We are committed to structuring partnership agreements that meet your objectives, accelerate commercialization, provide experiential learning opportunities to our students, and support the publication rights of our researchers. According to Reuters, U of T is Canada's most innovative university. In the last three years, our researchers created over 1,000 inventions and filed more than 300 patents. For more on U of T partnerships, visit **uoft.me/industrypartners**

SAVE TIME AND MONEY: USE OUR RESEARCH INFRASTRUCTURE

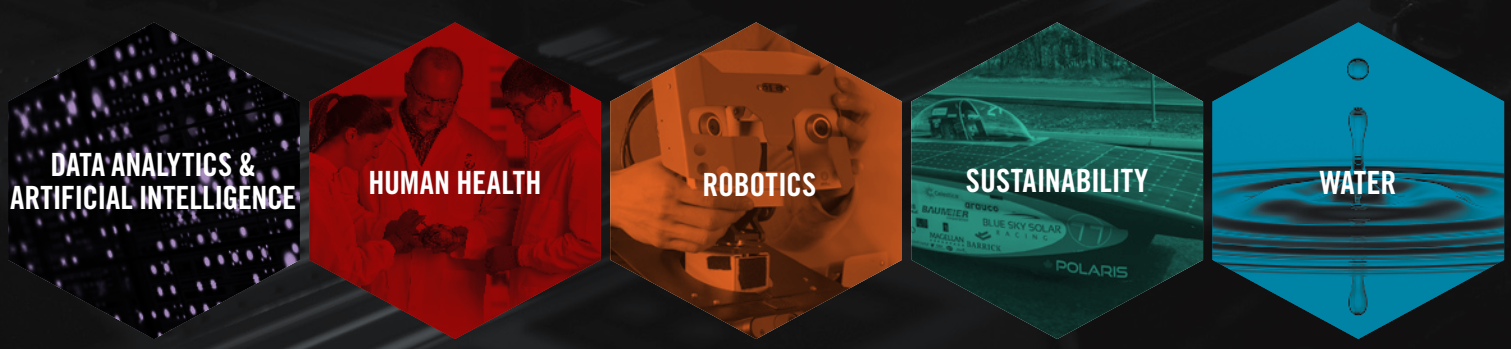
Why put resources toward research infrastructure — equipment and facilities — when you can leverage ours? U of T Engineering is home to some of the most advanced laboratories in the world, facilitating leading-edge research in diverse areas. As a partner, you'll gain access to our publicly funded facilities and technical personnel, resulting in significant savings for your company. In the last five years, we have invested nearly $60 million in engineering research infrastructure on campus.

OUR INNOVATION CLUSTERS

Our Innovation Clusters represent multidisciplinary, advanced research efforts that address a vast range of social, economic and industrial challenges. U of T Engineering has the breadth and depth of research excellence as well as the capacity to effect global change across these key domains.

Our partnerships with industry, government and other stakeholders enable U of T Engineering researchers across our Innovation Clusters to develop innovative technology-based solutions that address the needs of an evolving global marketplace. As an industry partner, our Innovation Clusters enable you to approach your most pressing challenges in a dynamic and driven environment, allowing your company to be nimble in a complex business landscape.

The Propulsion and Energy Conversion Laboratories study the complex physical and chemical processes that take place inside combustion engines used in jet aircraft or large power plants. Adapting such engines to produce fewer emissions and use less fuel — or even to use biofuels — can compromise the stability of their operation. The research group is working toward making low-emission engines safe enough to replace current models. This lab is one of several housed within the U of T Institute for Aerospace Studies (UTIAS), an advanced research facility located in north Toronto.



MYHAL CENTRE FOR ENGINEERING INNOVATION & ENTREPRENEURSHIP

A BOLD COMMITMENT TO ENGINEERING INNOVATION

In Spring 2018, U of T Engineering celebrated the opening of the Myhal Centre for Engineering Innovation & Entrepreneurship — a nine-level facility at the heart of the University of Toronto's St. George campus.

By design, the Myhal Centre inspires new levels of collaboration, innovation and entrepreneurship. The building's state-of-the-art features — which include prototyping and fabrication facilities, design studios and technology-enabled learning spaces — bring together industry partners with researchers, students and alumni to address a breadth of industrial challenges. The Myhal Centre creates an ideal ecosystem for innovation and commercialization.

A strong university helps build a strong city. U of T Engineering has a long history of nurturing exceptional changemakers whose success contributes to the regional marketplace and positively impacts job and wealth creation in Toronto. The Myhal Centre combines some of the University's premier technology incubators and industry-focused research hubs that strengthen our Innovation Clusters — including the U of T Robotics Institute, the Institute for Sustainable Energy and Centre for Global Engineering — all under one roof.

It's never been a more exciting time to partner with U of T Engineering.

For more on the Myhal Centre, visit uoft.me/MyhalCentre

Researchers from around the world congregate in the Myhal Centre's Lee & Margaret Lau Auditorium for the 10th Biannual Conference on Quantum Dots. This unique, tech-enabled space re-imagines the relationship between speaker and audience. Its 468 chairs are arranged around tables to encourage collaboration. A data communications system embedded in each table enables the presenter to display any group's work onto the stadium-style display array.

WAYS TO PARTNER

GOAL-DRIVEN

Whether you aim to address a specific engineering challenge faced within your company, build brand awareness or create a pipeline of exceptional talent, we can help you achieve your goal. Meet your company's targeted objectives by partnering on a specific initiative. For example:

- **Sponsor a collaborative research project to address a defined industry challenge.**
- **Fuel future talent by supporting internship opportunities and scholarships for undergraduate and graduate students.**
- **Contribute your company's equipment, devices and technical instruments to our extensive research facilities to build awareness of your brand.**

STRATEGIC

Your company is committed to pushing the leading edge of innovation to advance your mid- to long-term R&D priorities — and a strategic partnership with U of T Engineering can get you there. This level of partnership typically involves providing seed funding for a new research initiative in conjunction with support to grow our research capacity (e.g., through an Industrial Research Chair) in an area of strategic priority for your corporation. Strategic partnerships also address goal-driven interests via collaborative research projects.

COMPREHENSIVE

Through a coordinated integration of research, training and infrastructure support, a comprehensive partnership is designed to advance your company's innovation agenda. This level of partnership offers the highest ROI for a company looking to achieve multiple objectives and often combines a new capital investment to enable capacity building and collaborative research funding. Comprehensive partners also play an important role on our advisory boards and in championing new government initiatives.

"IBI has developed a very strong relationship with U of T and its researchers. In particular, we work closely with experts at the Ontario Centre for the Characterisation of Advanced Materials (OCCAM). The information and data generated as a result of working with OCCAM has been critical in advancing our R&D efforts — from the bench to commercialization."

JEANNETTE HO
Vice-President Product Development,
Interface Biologics, Inc.

Pictured here, OCCAM is a multidisciplinary U o f T Engineering facility that provides leading-edge equipment — including electron microscopes and mass spectrometers — and expertise in the imaging, analysis and manipulation of materials at the nanometre scale. OCCAM was created with strategic investments from the Canada Foundation for Innovation (CFI), the Ontario Ministry of Research and Innovation (MRI), and Hitachi High-Technologies Canada.

PARTNERSHIPS IN ACTION

GOAL-DRIVEN PARTNER: McEWEN MINING

In 2017, Toronto-based mining company McEwen Mining partnered with U of T Engineering to apply advanced unmanned aerial vehicle (UAV) technology to their operations. Like many mining companies, McEwen Mining invests heavily in equipment and personnel to execute tasks that can be dangerous and time consuming, from mapping and production monitoring to mineral exploration and tracking stockpiles. Working with Professor Angela Schoellig from the U of T Institute for Aerospace Studies and Professor Kamran Esmaeili in the Department of Civil & Mineral Engineering, McEwen Mining is developing UAV systems for real-time mining data acquisition and decision-making. Drones fitted with advanced sensors can provide real-time aerial footage and 3D maps of sites that would be difficult to explore by traditional methods, saving the company both time and money.

An unmanned aerial vehicle (UAV) field test at a McEwen Mining site in Mexico.

STRATEGIC PARTNER: HATCH LTD.

For decades, Hatch Ltd. — a leading global engineering, technology and project-delivery firm — and U of T Engineering have worked together in a symbiotic relationship that encompasses research, education and mentorship. This academic-industry collaboration has included a range of initiatives, from developing wind-energy technologies and advancing fuel cells to exploring alternatives for energy production. Most recently, Hatch has partnered with Professor Gisele Azimi — an expert in the fields of electrochemistry, thermodynamics and advanced materials design — on a project that uses a novel technique to extract and recycle lithium from batteries. Beyond research partnership, Hatch attracts top engineering talent from U of T by hiring through the Professional Experience Year Co-op Program and offering several scholarships to exceptional engineering students.

Hatch Ltd. receives the Corporate Academic Citizen Award at the annual U of T Engineering Industry Partner's Reception.

COMPREHENSIVE PARTNER: FUJITSU LABS LTD.

In spring 2018, multinational information and communication technology company Fujitsu Labs Ltd. launched the Fujitsu Co-Creation Research Laboratory at the University of Toronto — the company's first Canadian R&D centre. The new research hub will accelerate collaborative work in such fields as machine learning, quantum computing, smart cities, advanced health care and financial technology. Fujitsu Labs is one of the latest tech multinationals to move into downtown Toronto, drawn by the city's burgeoning global reputation in artificial intelligence and data analytics — growth areas driven by the research conducted at U of T and its affiliated hospitals. To date, this partnership has led to 10 patents, the publication of more than 30 joint research papers and over $7.5 million in direct funding and in-kind contributions for research.

A global delegation from Fujitsu Labs Ltd. meets with U of T leadership to discuss the thriving research collaboration.

"Our UAV project with U of T has provided us access to world-class aerospace and mining expertise. We have moved quickly from lab-scale experiments to field trials at our mine in Mexico. The results have already led to several technical papers and conference presentations. We hope that these findings will lead to a commercial arrangement in the near future."

NATHAN STUBINA
Managing Director – Innovation, McEwen Mining

"One of the key things Hatch is known for is bridging the gap between research and commercial operations. Having a close linkage with U of T has been an important part of that journey."

JIM SARVINIS
Global Director, Nuclear, Hatch

"Fujitsu's continued collaboration with this world-leading institution further strengthens and catalyzes our ability to produce research innovations. Establishing the Fujitsu Co-Creation Research Laboratory at the University of Toronto is the next step in advancing this flourishing relationship."

TATSUYA TANAKA
President, Fujitsu Labs Ltd.

LEADING INNOVATION STARTS HERE

To discuss how a partnership with U of T Engineering can benefit your organization, contact:

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ACKNOWLEDGEMENT OF TRADITIONAL LAND

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

Engineering