UNIVERSITY OF TORONTO

INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) CLUSTER

TORONTO'S ICT SECTOR

Combined revenue:
$52B

People employed:
161,000

Number of firms:
14,600

U of T'S CONTRIBUTION

Research funding attracted in last 5 years:
$865M

Faculty members in ICT:
417

CRCs in ICT Fields:
**71**

ICT degrees awarded, 2011-15:
2,167

ICT startups created in last 5 years:
43

U of T's ICT global ranking (Times Higher Education 2015)
25th

As one of the world's leading ICT and media hubs, Toronto has a rich technology ecosystem with remarkable depth and breadth. Toronto is Canada's largest, most dynamic, and innovative ecosystem of technology-focused businesses and the 3rd largest ICT cluster in North America. Toronto's diverse ICT workforce, educational infrastructure and proximity to essential adjacent skills are critical to its competitive position. The GTA is home to 35% of Canada's technology businesses—of the top 250 Canadian ICT companies listed on the 2016 Branham300, 36% are located in the Toronto metropolitan area. All of the top multinationals such as Alphabet (Google), Facebook, IBM, Cisco Systems Canada, Symantec, Microsoft Canada, and AutoDesk have established offices in the GTA. Toronto is also home to one of the world's biggest clusters of mobile-application companies in North America.
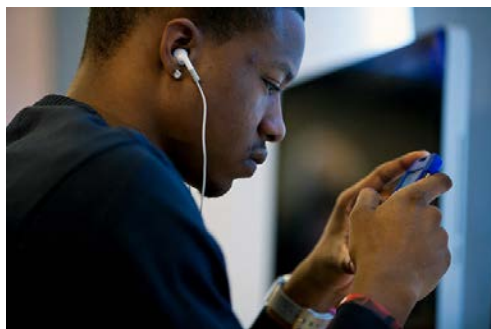
HOW U of T ENHANCES THE CLUSTER

U of T is at the forefront of this revolution in ICT, big data, machine learning, and advanced computation and is uniquely positioned to lead Canada into the data-driven future. U of T is also establishing an Advanced Research Computing centre that will serve as the new home for the SciNet HPC Consortium, a major hub in Compute Canada's HPC network and the country's largest supercomputing facility, as well as the Southern Ontario Smart Computing Innovation Platform, operator of Canada's fastest supercomputer.

Our faculty members have an impressive record of recent entrepreneurial activity—235 inventions disclosed to U of T in the last 5 years are in ICT, and over the same period they secured 267 patents. Many U of T faculty members are also highly integrated within the Toronto Academic Health Science Network, where they oversee medical and bioinformatics research arising from the data associated with millions of patient visits per year and research funding close to a billion dollars per year.

## KEY EDUCATIONAL AND RESEARCH PROGRAMS

- Applied Computing
- Applied Genomics
- Banting & Best Ctr Innovation and Entrepreneurship
- Citizen Lab
- Computational Biology Lab
- Computer Science
- Data Sciences
- Digital Curation Institute
- Dynamic Graphics Project Lab
- Electrical & Computer Engineering
- Genome Biology & Bioinformatics
- Global Change Science
- High-Performance/Advanced Research Computing
- HPC4Health
- Information Studies
- Mathematics & Applied Mathematics
- Quantum Information & Quantum Control Statistical Sciences & Applied Statistics

KEY FACILITIES & INITIATIVES

- Centre for Computational Medicine
- Critical Making Lab
- Institute for Aerospace Studies
- Inst Clinical Evaluative Sciences
- MaRS Innovation
- SciNet
- Strategic Network for Smart Applications on Virtual Infrastructures
- Techna Institute (with UHN)
- Toronto Nanofabrication Centre
- Transportation Research Institute

U of T INNOVATION IMPACTS
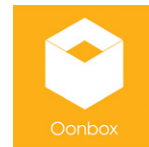
Blue J Legal

Founded by Professors Benjamin Alarie, Anthony Niblett, Albert Yoon, and collaborator Brett Janssen, Blue J Legal uses the power of IBM's Watson cognitive computing technology to transform legal research. Watson can synthesize and understand vast amounts of data, including legislation, academic publications and administrative documents such as Canada Revenue Agency bulletins, to analyze fact situations and discover in seconds distinctions that humans miss. This technology has the potential to provide a much deeper legal analysis than has ever been possible, incorporating multiple factors such as the role of strong and weak precedents, court hierarchies and judges' motivations.

Nymi

Founded by U of T graduates Foteini Agrafioti and Karl Martin, Nymi uses the heartbeat as a biometric identifier for authentication. Nymi's HeartID software detects and distinguishes a person's unique heartbeat, or cardiac signal, through sensors. The technology can be used to secure various devices with greater than 99% accuracy—roughly the same as current fingerprint-enabled security systems.

Whirlscape

Founded by Professor Khai Truong and alumnus Will Walmsley, Whirlscape has taken the QWERTY keyboard and reworked it to fit on a single line of text onscreen. The keyboard uses a specialized, auto-correction algorithm that corrects highly imprecise typing. This algorithm configures the difference between what you type and what you mean, in real time—getting it right even if you miss every single letter.

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