UNIVERSITY OF TORONTO

INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

Toronto is Canada's largest, most dynamic and innovative ecosystem of technology-focused businesses, and the third largest ICT cluster in North America. In an annual survey of global tech industry leaders, six per cent said Toronto is outpacing its competitors such as Silicon Valley and San Francisco. Toronto's diverse ICT workforce, educational infrastructure and proximity to essential adjacent skills are critical to its competitive position. The Toronto Census Metropolitan Area (CMA) is home to 35% of Canada's technology businesses—of the top 250 Canadian ICT companies listed on the 2016 Branham300, 37% are located in the Toronto CMA. The top five multinational ICT firms—IBM, Alphabet (Google), HP, Cisco Systems, and Microsoft Canada—have located their Canadian headquarters in the GTA. Toronto is also home to one of the world's biggest clusters of mobile-application companies in North America. In a joint effort with Waterfront Toronto, Alphabet's Sidewalk Labs will create a new kind of mixed-use community on Toronto's Eastern Waterfront. Additionally, Smart City Toronto is using technology and data to improve navigation of the city, as well as access to services and engagement with local government for its residents and businesses; it helps the city to become an economically, socially and environmentally-connected community.

TORONTO'S ICT SECTOR

Combined revenue:

$52B

People employed:

170,000

Number of firms:

14,600

U of T'S CONTRIBUTION

Bench Strength in Related Research & Innovation

Research funding attracted in last 5 years:

$491M

Canada Research Chairs:

59

Faculty members:

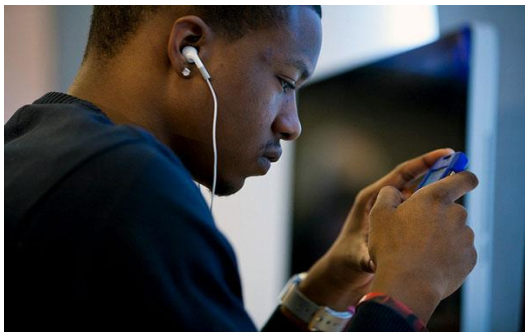
491

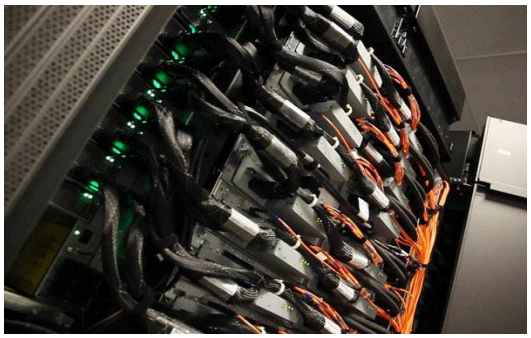
Graduate students supervised:

1,378

Startups created in last 10 years:

172





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 hosts the **SciNet HPC Consortium, the country's largest supercomputing facility** and a major hub in Compute Canada's HPC network, as well as **SOSCIP, Canada's only R&D consortium using data science to drive innovation**. SciNet operates the Niagara supercomputer, one of Canada's most powerful advanced research computing platforms. U of T's strong performance internationally in research across ICT is a measure of the excellence of our faculty and graduate students, their propensity for collaborating with leading researchers around the world, and our track-record of supporting and enabling investigator-led and partnered research with industry, both locally and globally. 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 in ICT are also highly integrated within the Toronto Academic Health Science Network (TAHSN), where they oversee medical and bioinformatics research arising from the data associated with millions of patient visits per year, and are supported by hundreds of millions of dollars per year in research funding.

KEY EDUCATIONAL AND RESEARCH PROGRAMS

- Applied Computing
- Applied Genomics
- Citizen Lab
- Computational Biology Lab
- Computer Science
- Data Sciences
- Digital Curation Institute
- Digital Humanities
- Dynamic Graphics Project Lab
- Electrical & Computer Engineering
- Genome Biology & Bioinformatics
- Global Change Science
- High-Performance/Advanced Research Computing
- HPC4Health
- Information Studies
- Management Analytics
- Mathematics & Applied Mathematics
- Quantum Information & Quantum Control Statistical Sciences & Applied Statistics
- U of T Entrepreneurship

KEY FACILITIES & INITIATIVES

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

U of T & HOSPITAL INNOVATION IMPACT

Kepler Communications

Founded in 2015 by four U of T graduates, Mina Mitry, Jeffrey Osborne, Mark Michael, and Wen Cheng Chong, Kepler has developed high-throughput satellite communication technologies with off-the-shelf antennas and modems and made it reliable, secure, and simple for enterprises to use satellite services. Kepler builds, launches and operates satellites, and provides pole-to-pole satellite data backhaul services for wideband and Internet of Things applications to deliver in-space connectivity. The technology can be used for maritime usage, defense and tourism purposes, as well as for the exploration and extraction of natural resources in the poles. It supports transferring large quantities of weather, mapping, seismic, and astronomy data between remote sites and data processing centers ensuring rapid analysis and activities planning.

BlueDot

Founded by Dr. Kamran Khan, U of T Associate Professor and an infectious disease physician and scientist at St. Michael's Hospital, BlueDot has developed a web-based platform that creates "situational awareness" of infectious disease threats around the around the world and how they can move through air travel. Bluedot has combined public health and medical expertise with advanced data analytics to build solutions that track, contextualize, anticipate infectious disease risks, and provide actionable intelligence for health workers and employees on the front lines.

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. Nymi solves the privacy issue of protecting a person's identifiable information by keeping their heart rhythm signature local to the hardware.

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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