

Biometrics in the Toronto Region

November 25, 2009

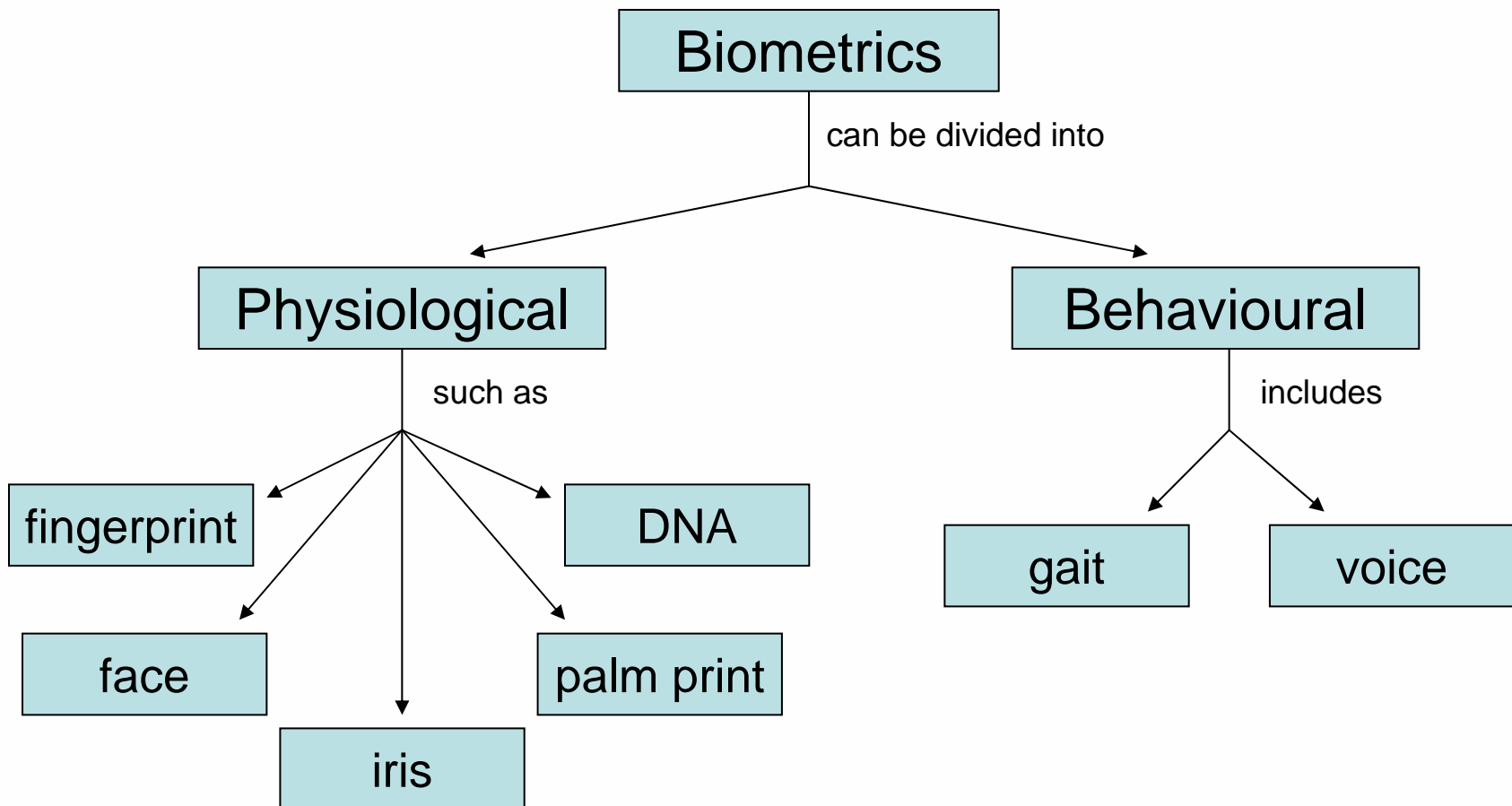


Outline

- Definition – what is biometrics?
- Global trends
- Global Status in Publications and Patents
- Overview of regional assets
 - Research institutes and scientific expertise
- State of the industry
 - Companies and labour force
- Opportunities in Ontario and Canada

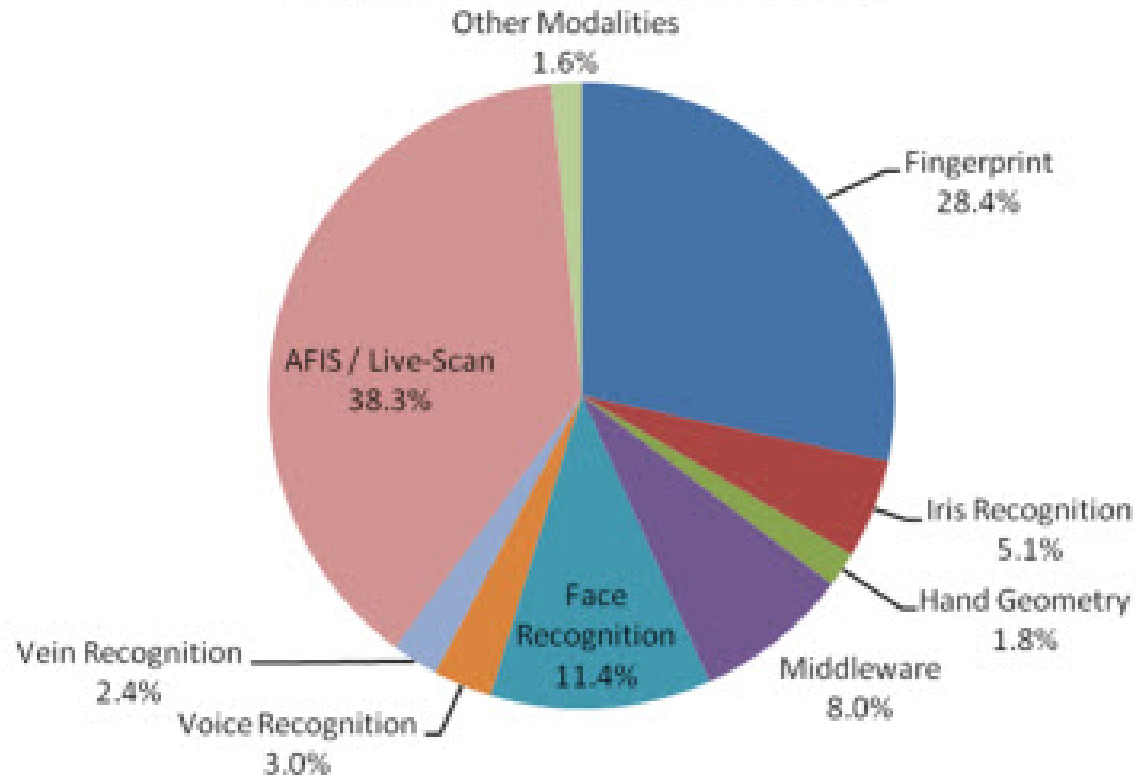
What is Biometrics?

- As a characteristic:
 - A measurable biological and behavioural characteristic
 - Unique and therefore can be used for identification
- As a process:
 - Automated methods of recognizing an individual based on measurable biological and behavioural characteristics
- First known example of biometrics dates back to the 14th century in China



Biometric Revenues by Technology, 2009

Copyright © 2008 International Biometric Group



Source: International Biometric Group, October 2008

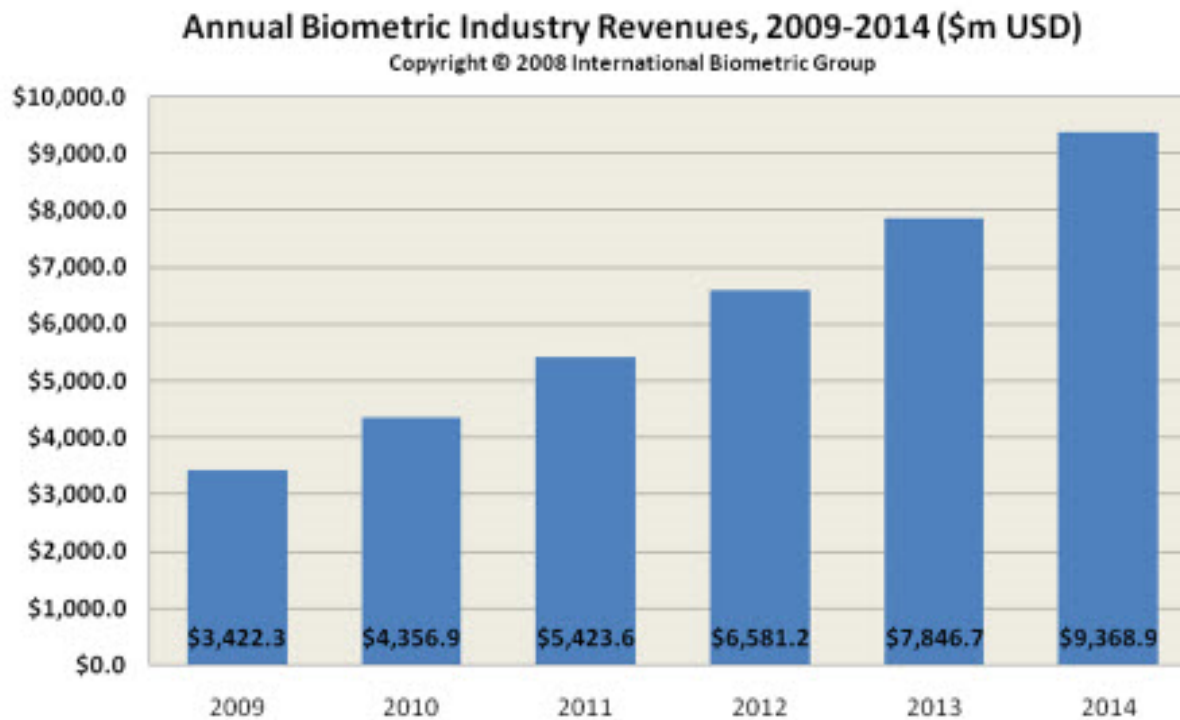
Global Trends

- Increasing security concerns and decreasing costs driving the biometrics market
- US-VISIT Program – collection of biometrics data from international travelers at U.S. visa-issuing posts and ports of entry
- Similar biometric identification programs in other countries used to improve border security, including the UK, Australia, Japan, Canada, and the European Union
- Chinese biometrics market growing at a rate of 50% annually and could reach a market volume of over RMB 3 billion by 2010

“Biometrics is quite rightly viewed to be at the cutting edge of security technology”

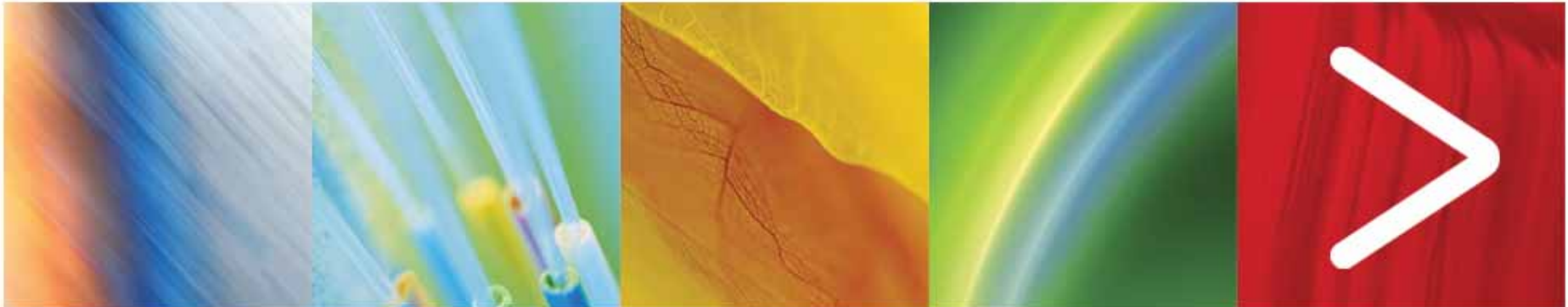
John Davies, Managing Director of DSI, one of the UK's leading access control technology companies

Global Trends



Sources: U.S. Department of Homeland Security; Infosecurity magazine, October 22, 2009; International Biometric Group, October 2008; PRWeb, <http://outdo.net/article.cfm/id/188026>, 2007; SourceSecurity.com

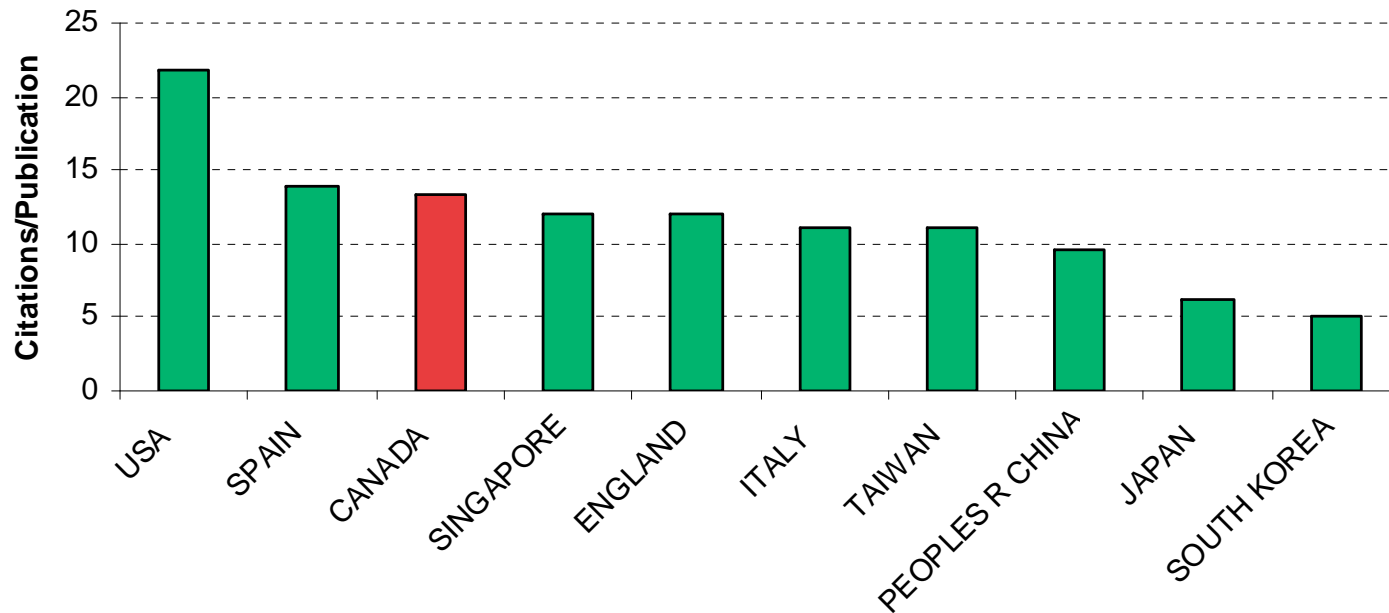
Global Status in Research and Patents



Canada as a Global Leader in Physiological Biometrics Research

Top 10 Countries for Physiological Biometrics Related Publications (1999 - 2009)

Total Global Publications: 1584

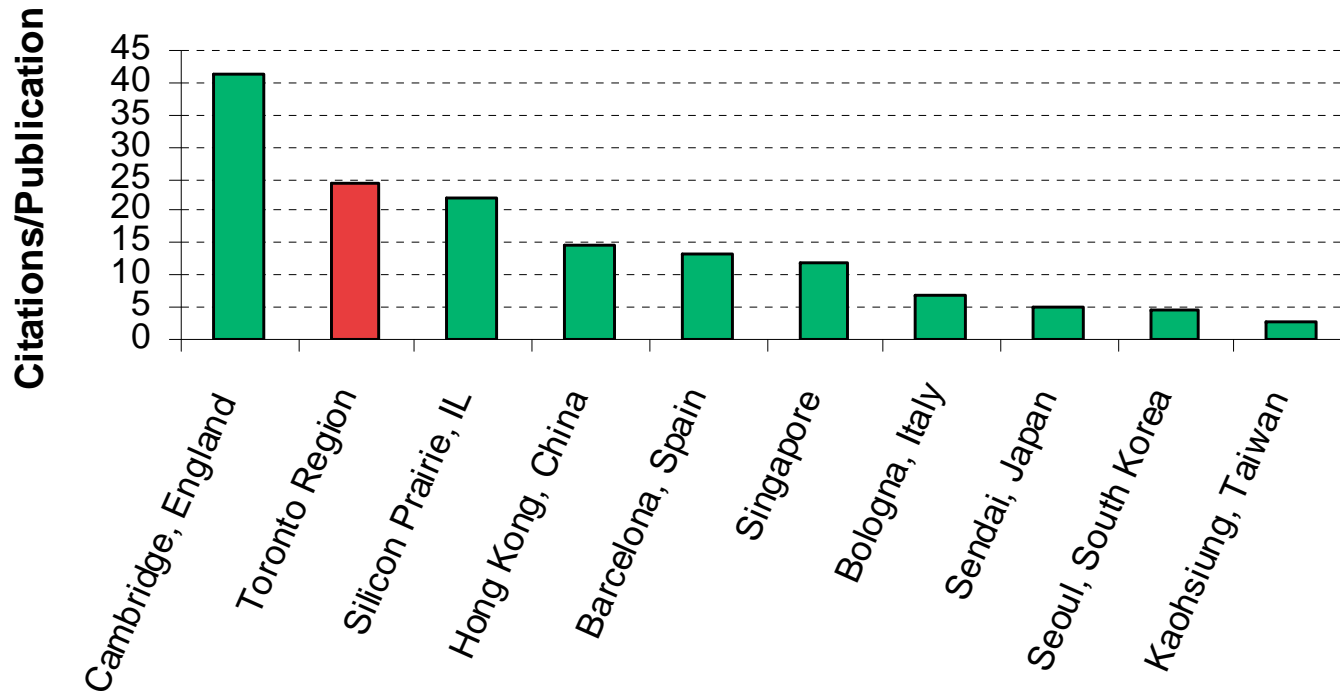


Source: ISI Publications, November 2009

Toronto Region's High Impact in Physiological Biometrics

Toronto Region vs. International Competitive Cities for Physiological Biometrics Related Publications (1999 - 2009)

Total Global Publications: 1584

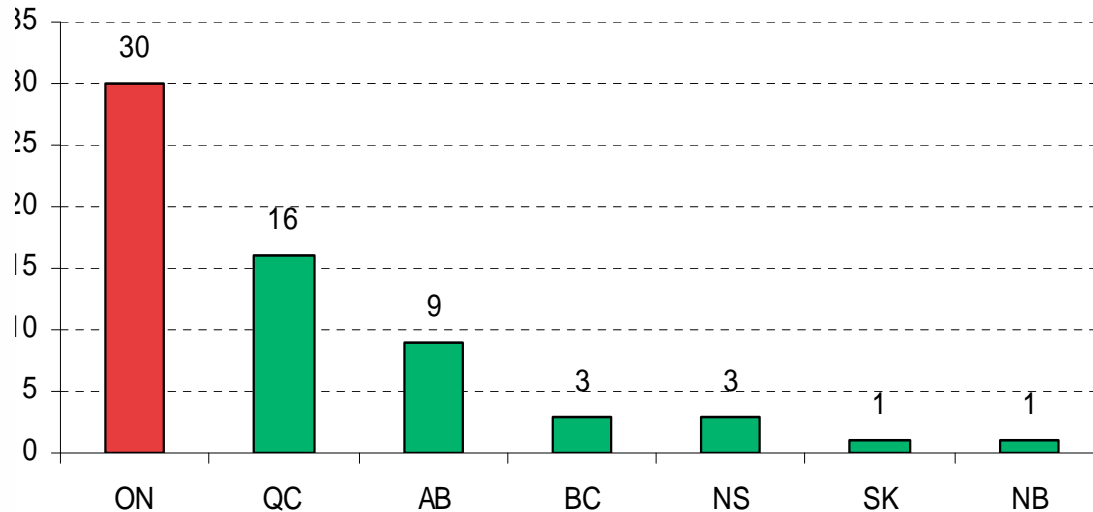


Source: ISI Publications, November 2009

Canada's Leader in Physiological Biometrics

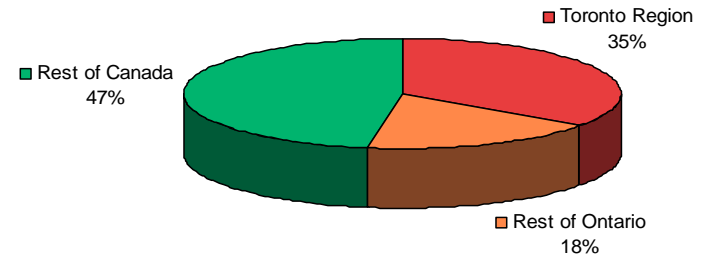
Canadian Physiological Biometrics Related Publications by Province (1999 - 2009)

Total Publications in Canada: 57



Distribution of Physiological Biometrics Related Publications in Canada by Region (1999 - 2009)

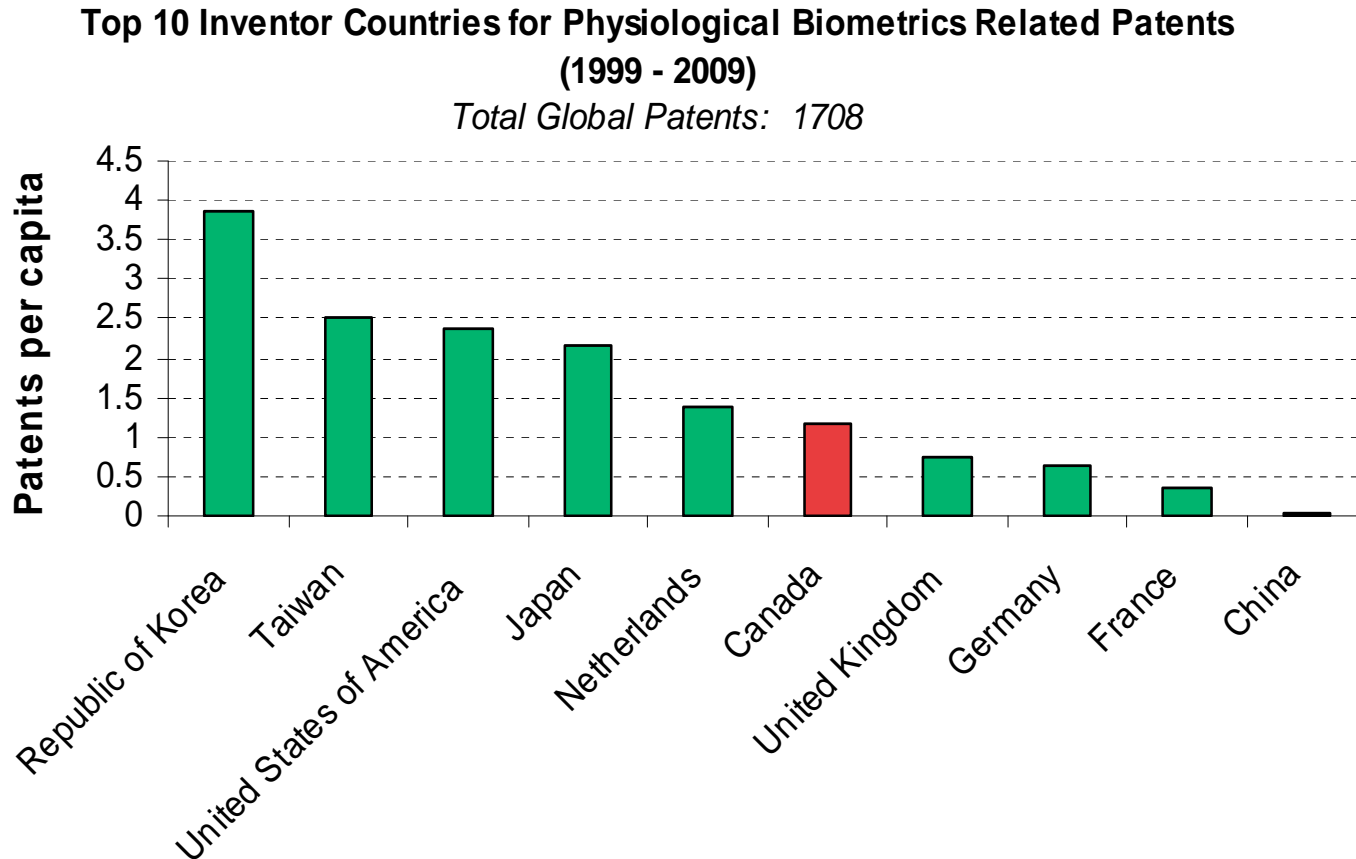
Total Publications in Canada: 57



Source: ISI Publications, November 2009



Physiological Biometrics Patents

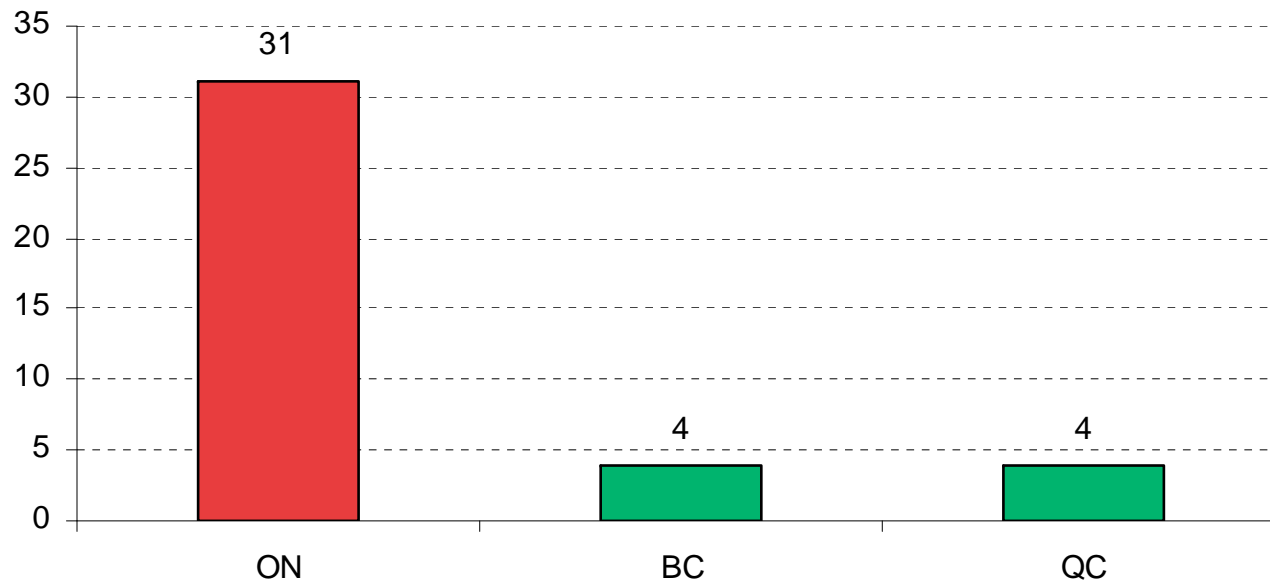


Source: Delphion, November 2009

Physiological Biometrics Patents continued

Canadian Physiological Biometrics Related Patents by Province
(1999 - 2009)

Total Canadian Patents: 39

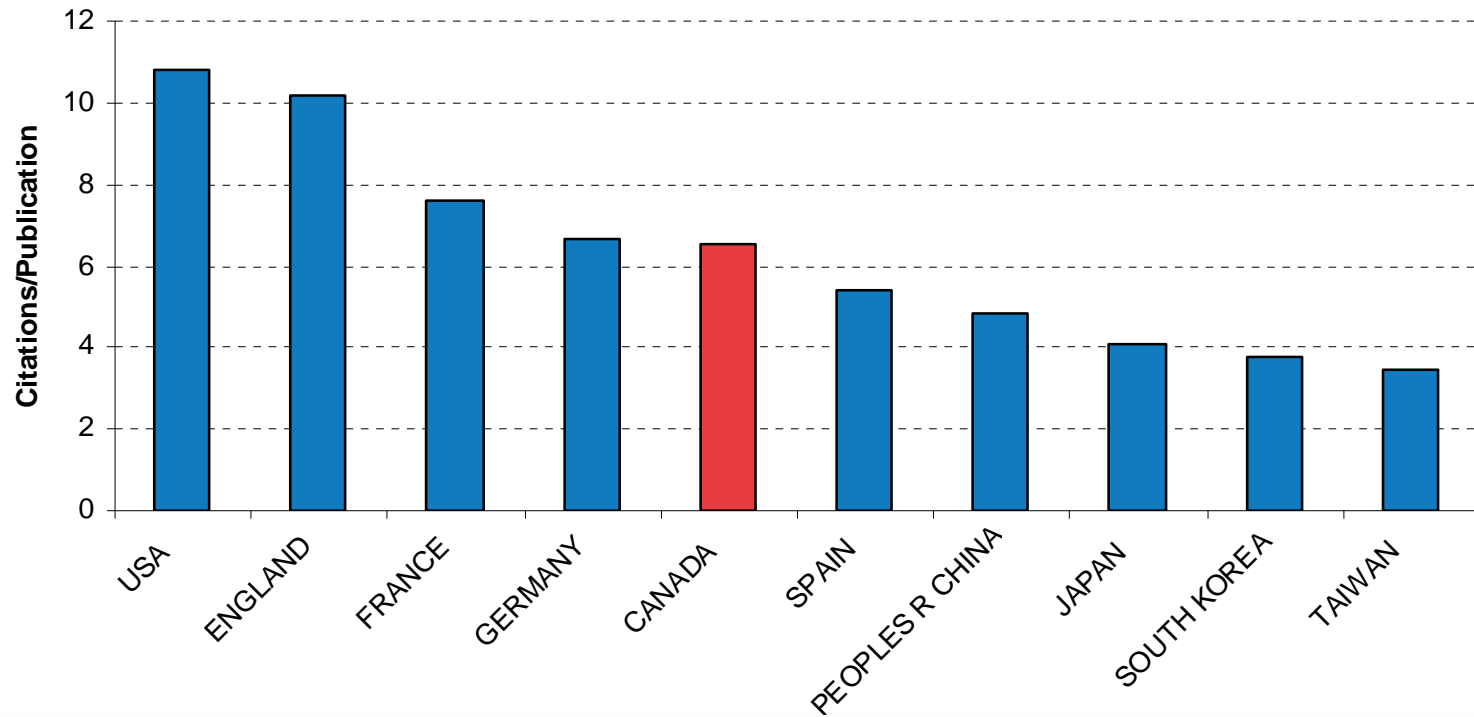


Source: Delphion, November 2009

Behavioural Biometrics Research

Top 10 Countries for Behavioural Biometrics Related Publications (1999 - 2009)

Total Global Publications: 2028



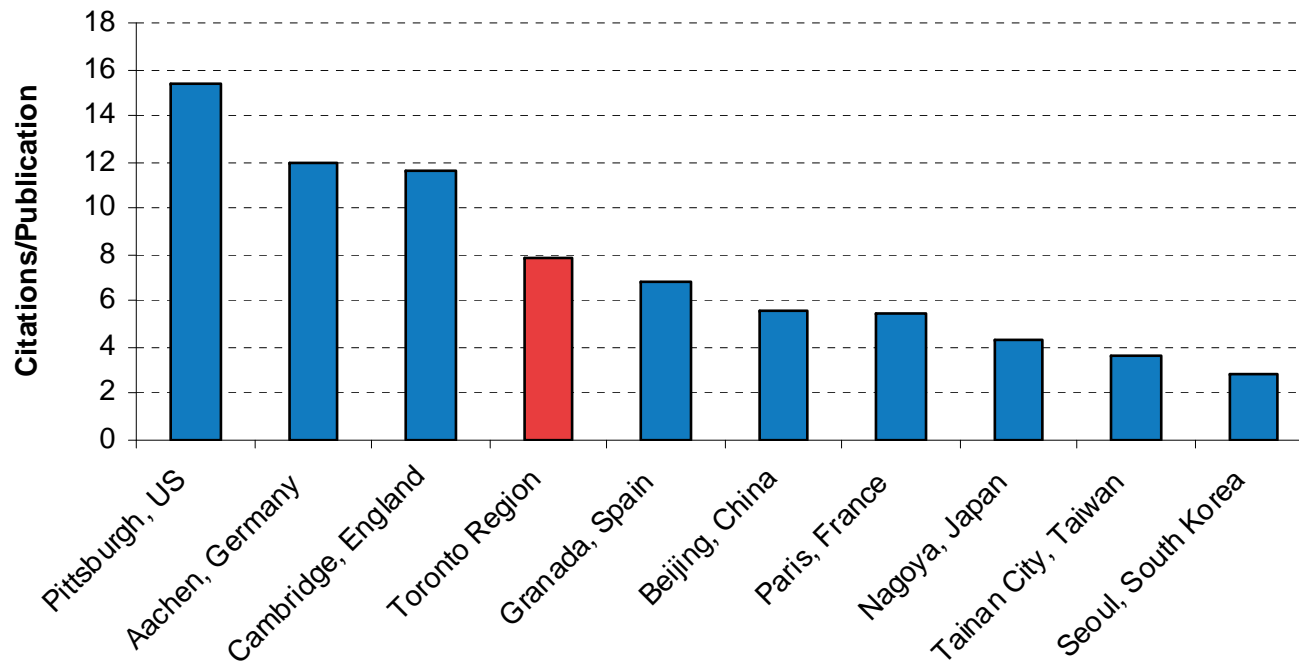
Source: ISI Publications, November 2009

Behavioural Biometrics in the Toronto Region

The TR's impact is comparable to leading international regions.

Toronto Region vs. International Competitive Cities for Behavioural Biometrics Related Publications (1999 - 2009)

Total Global Publications: 2028

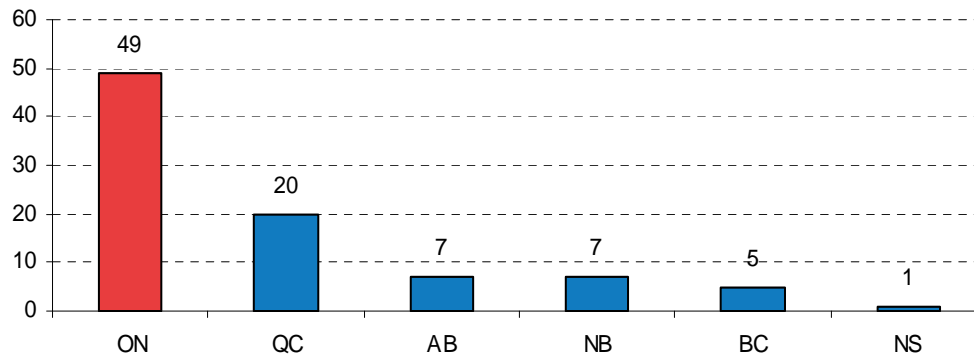


Source: ISI Publications, November 2009

Canada's Leader in Behavioural Biometrics

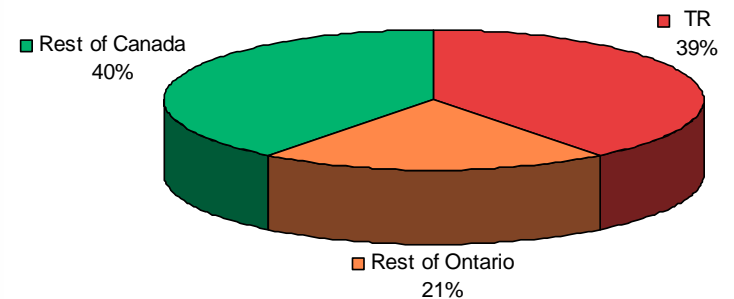
Canadian Behavioural Biometrics Related Publications by Province (1999 - 2009)

Total Publications in Canada: 81



Distribution of Behavioural Biometrics Related Publications in Canada by Region (1999 - 2009)

Total Publications in Canada: 81

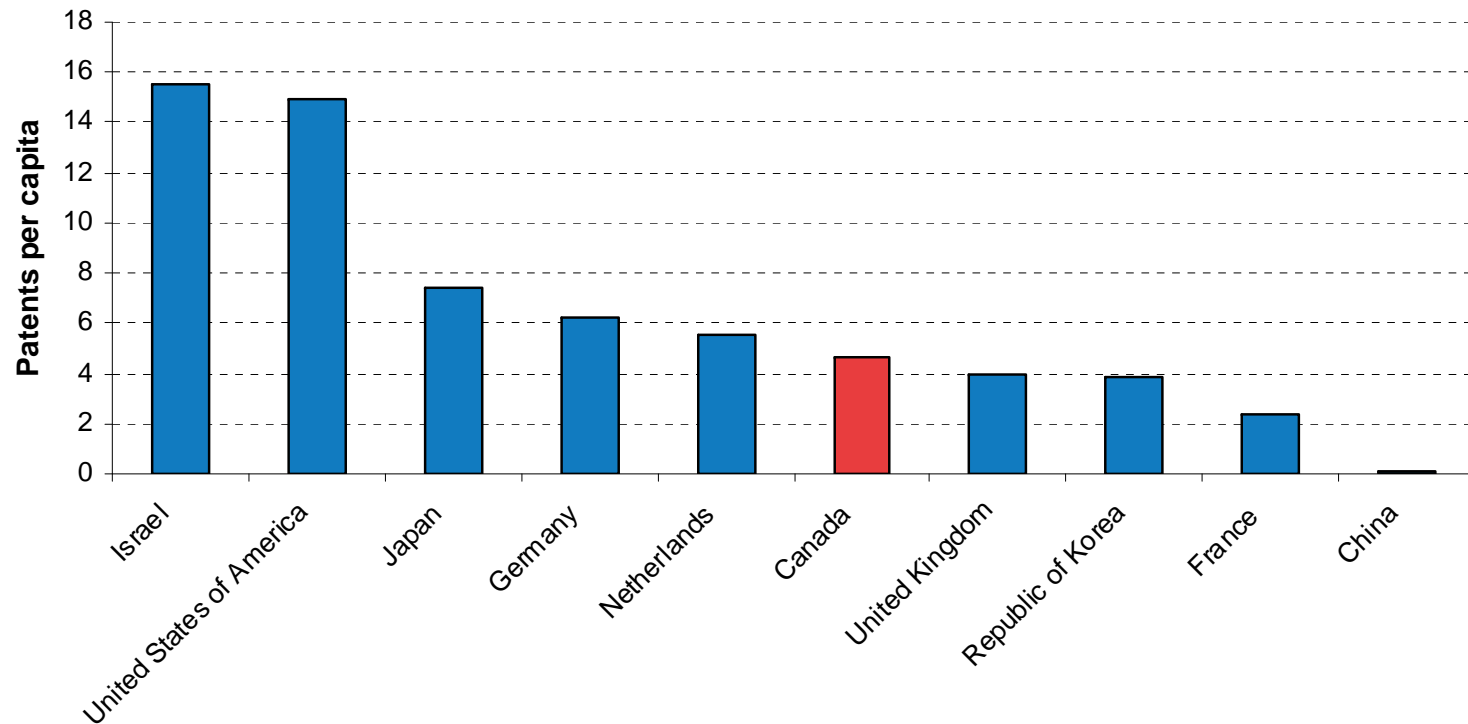


Source: ISI Publications, November 2009

Behavioural Biometrics Patents

Top 10 Inventor Countries for Behavioural Biometrics Related Patents (1999 - 2009)

Total Global Patents: 8788

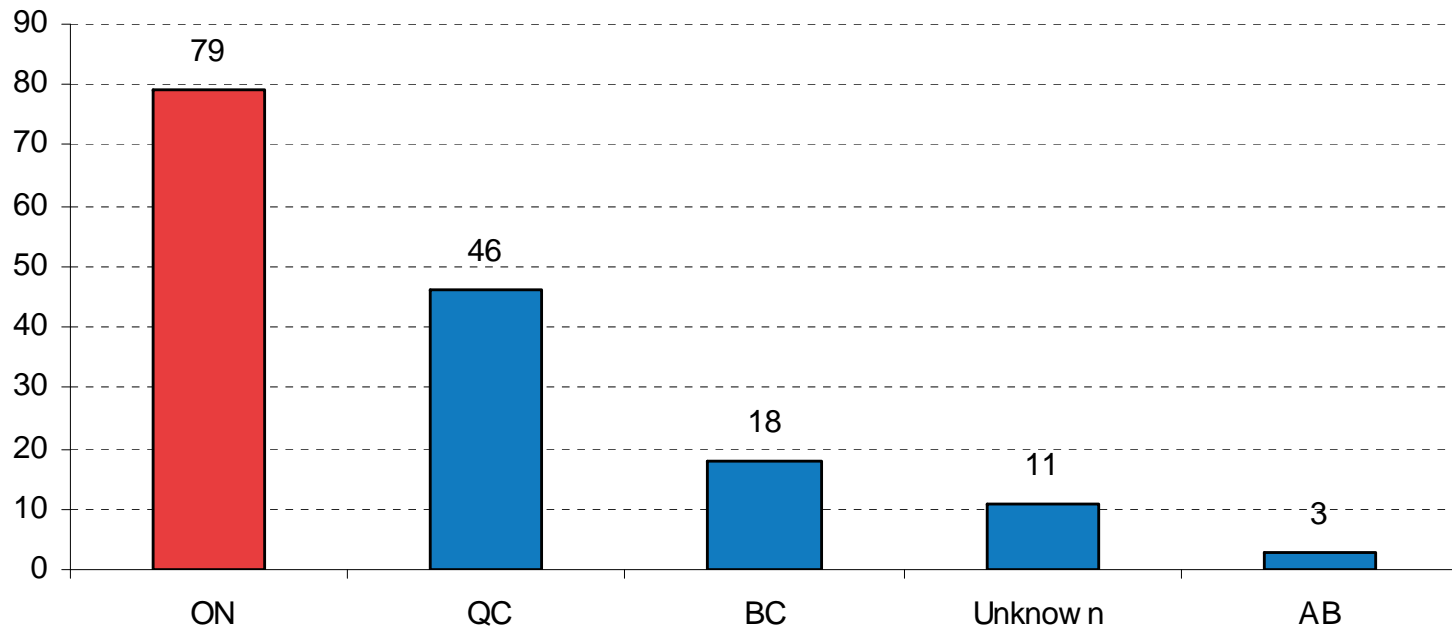


Source: Delphion, November 2009

Behavioural Biometrics Patents continued

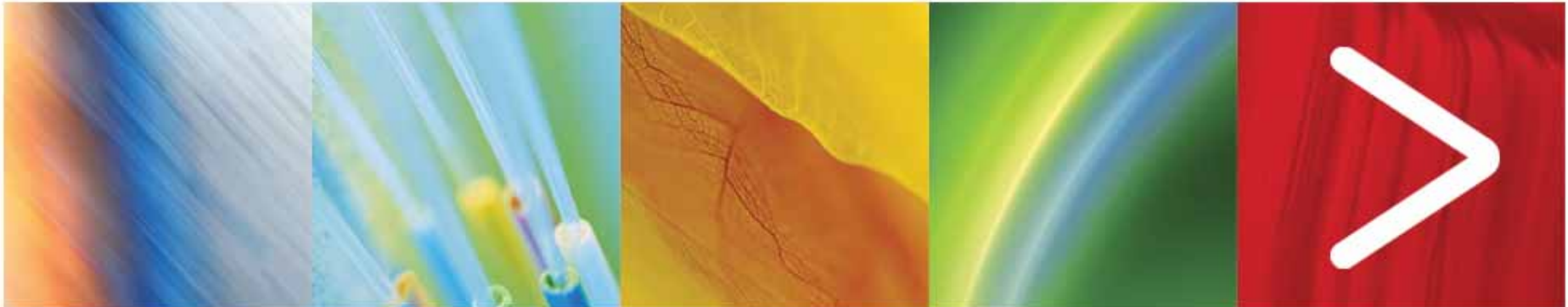
Behavioural Biometrics Related Patents in Canada by Province (1999 - 2009)

Total Patents in Canada: 157



Source: Delphion, November 2009

Research Institutes and Scientific Expertise



Centre of Advanced R&D: 22 Related Research Institutes and Groups

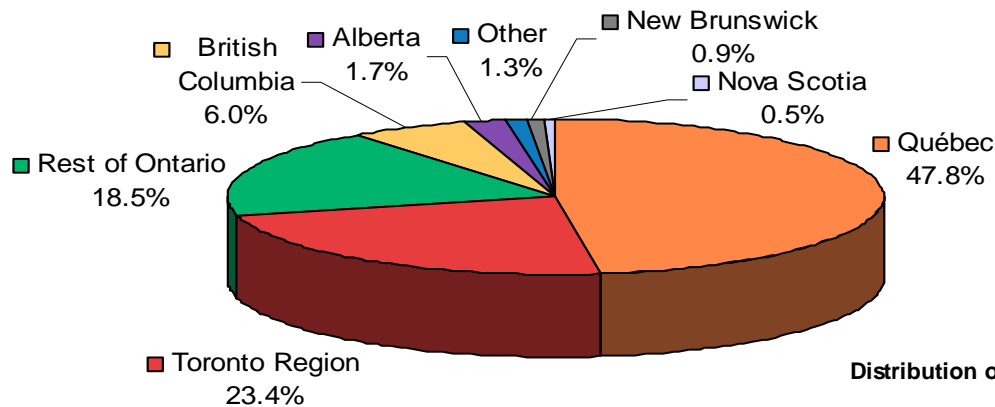
- Selected research groups and institutes

University of Toronto	Culture, Communication and Information Technology Emerging Communication Technology Institute Institute for Optical Sciences The Communications Group
University of Waterloo	Centre for Applied Cryptographic Research (CACR) Institute for Computer Research (ICR) Nortel Networks Institute for Advanced Information Technology (NNI) Pattern Analysis and Machine Intelligence Group
Ryerson University	Privacy and Cyber Crime Institute (PCCI) Ryerson University Multimedia Research Laboratory
McMaster University	Centre for Electrophotonic Materials & Devices Communications Research Laboratory Centre for Emerging Device Technology

NSERC and CFI Funding (1999 – 2009)

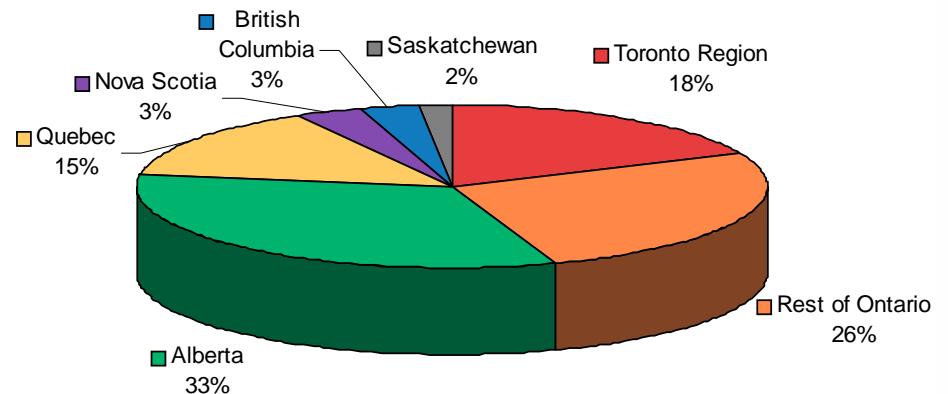
Distribution of NSERC Funding for Biometrics Related Projects in Canada by Province (1999 - 2009)

Total NSERC Funding: \$6,404,504



Distribution of CFI Funding for Biometrics Related Projects in Canada by Province (1999 - 2009)

Total CFI Funding: \$3,888,337

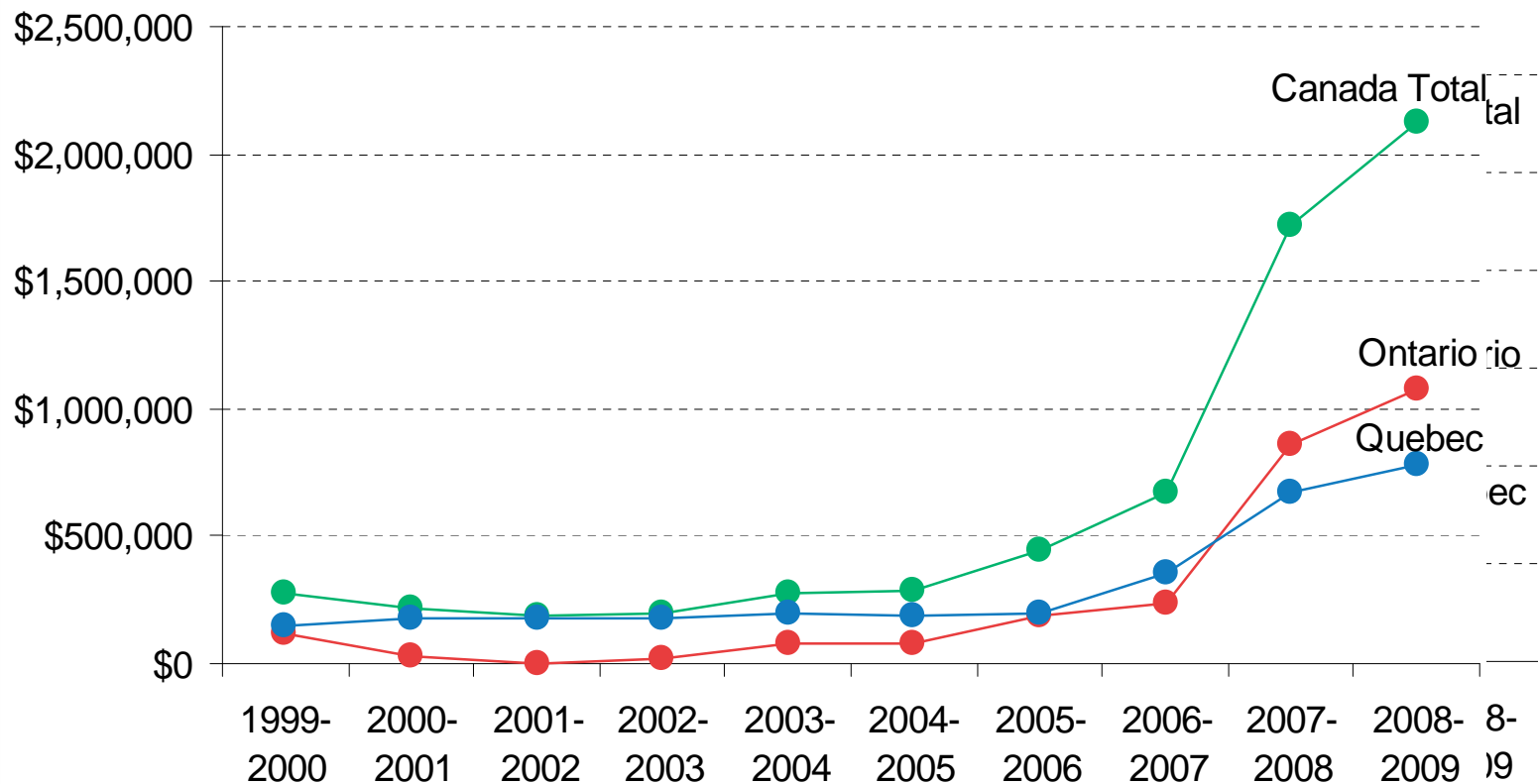


Sources: NSERC, October 2009; CFI, October 2009



Increase in Public Funding for Biometrics

NSERC Funding by Fiscal Year for Top Recipients



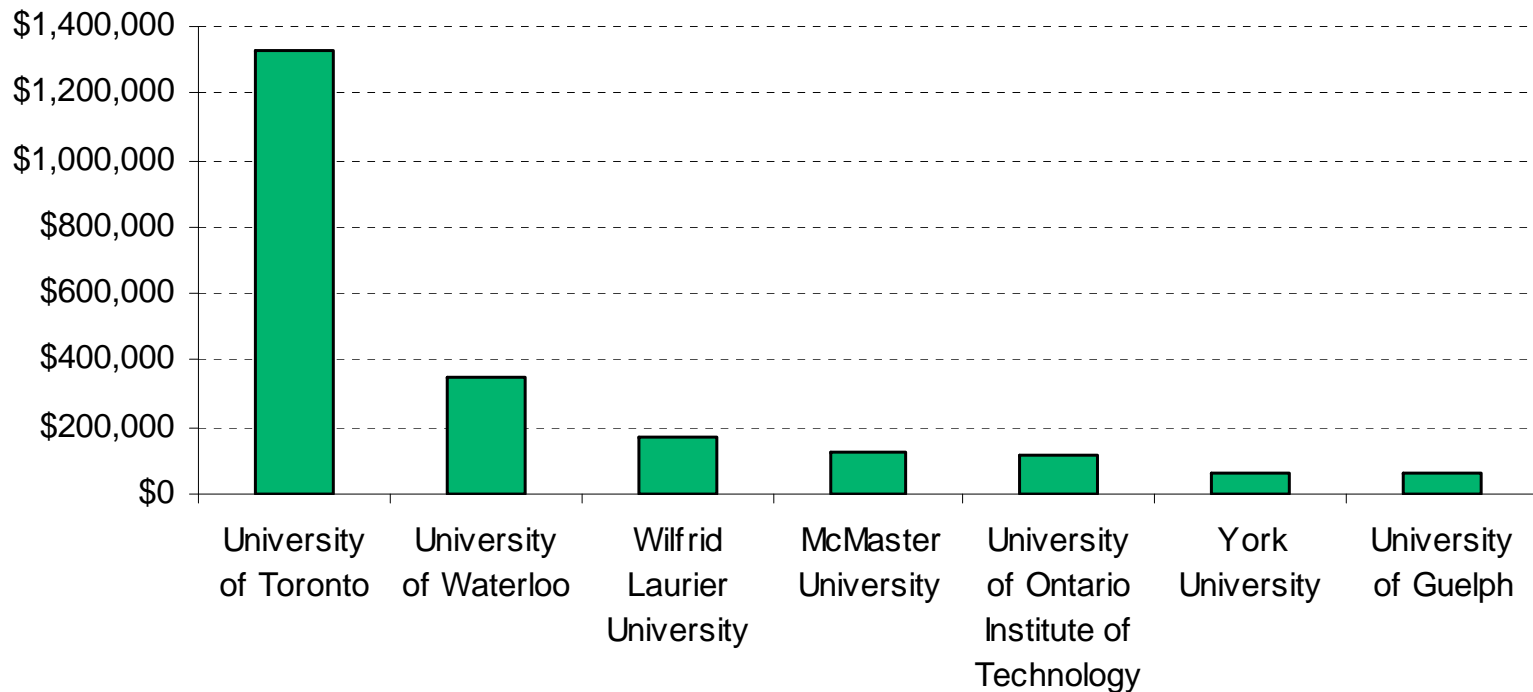
Source: NSERC, October 2009



Funding in the Toronto Region

Combined NSERC and CFI Funding for Biometrics Related Projects in the Toronto Region by Institution (1999 - 2009)

Total Funding in TR: \$2,211,492



Sources: NSERC, October 2009; CFI, October 2009

Innovative Research in the Toronto Region

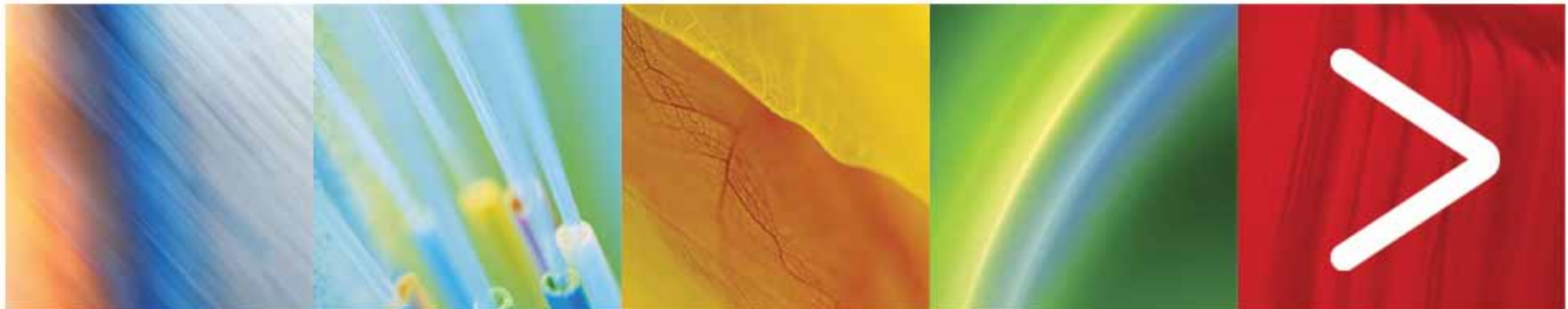
- 16 biometrics experts* in Canada, 9 of which are located in the Toronto Region
- Academic projects with potential for commercialization:

Project Name	University of PIs	Industrial Partners	Goal
BUSNET	University of Toronto	DRDC Toronto, Bell Canada	Integrated security architecture for the protection and storage of sensitive data within the domain of a care enterprise (e.g. wireless healthcare)
MUSES_SECRET	University of Ottawa, University of Waterloo, University of Toronto, Ryerson University	IBM Canada, Visual Cortek Inc., IMS Inc., Vestec Inc.	New multimodal (video and infrared, voice and sound, RFID and perimeter intrusion) intelligent sensor technologies for human-crowd surveillance applications in environments such as school campuses, hospitals, shopping centers, subways, airports, etc

*Note: Experts identified based on position as Canada Research Chairs, NSERC Industrial Research Chairs, or participation in major biometrics projects

Sources: Brenda McPhail; <http://www.ipsi.utoronto.ca/research.htm>; http://horizon.uwaterloo.ca/ras/MUSES_SECRET.pdf

Industry Status



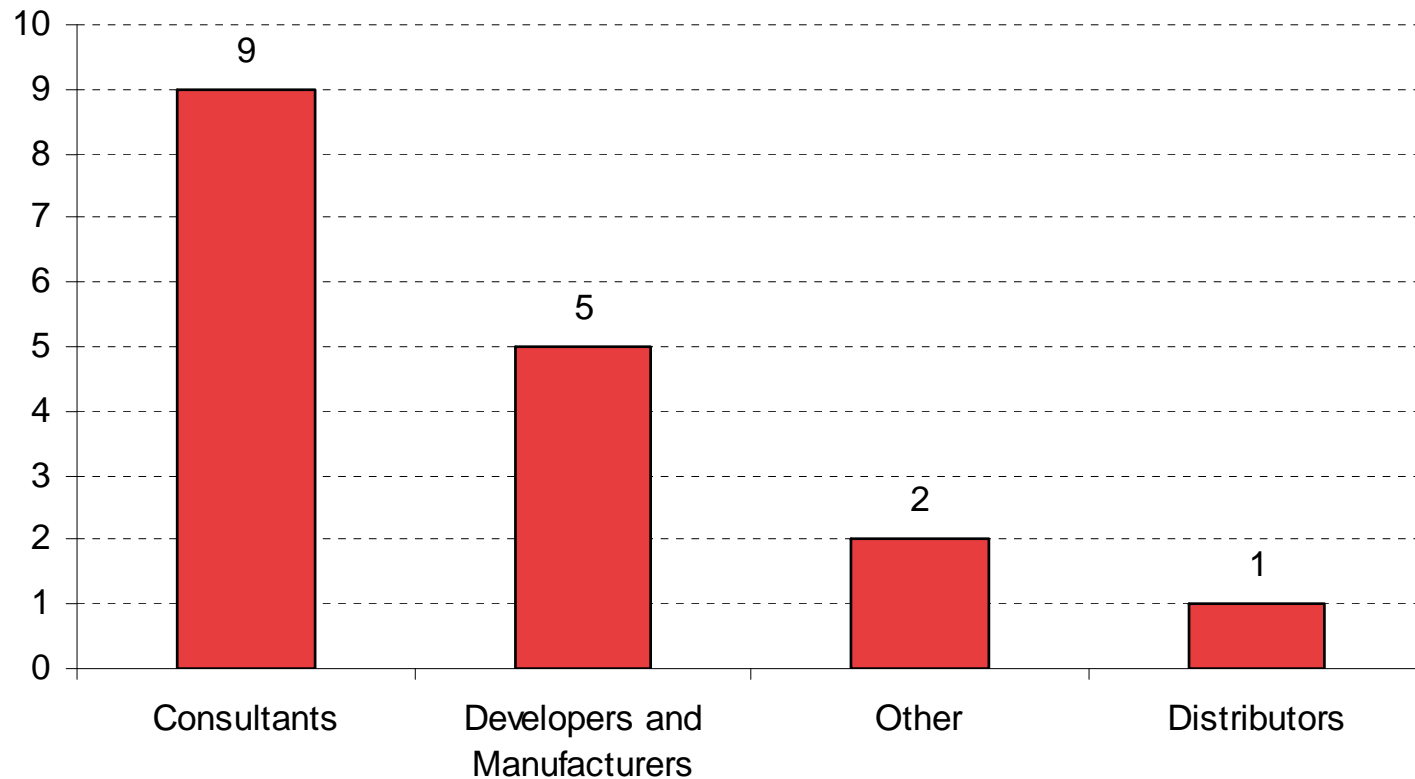
Highly-Educated and Highly-Skilled Workforce

The Toronto Region has:

- Over 5000 college and university graduates (all levels) in biometrics related programs in 2007
- 89 undergraduate and 25 graduate related programs of study offered by 8 universities in 2008, which is more than 50% of all related programs of study in Ontario
- Over 30% of the potential biometrics labour force in Canada

Biometrics-related Companies in the Toronto Region

- 17 companies in the Toronto Region



Source: Industry Canada, October 2009; Brenda McPhail

Home to Key Players in the World Biometrics Market

- L-1 Identity Solutions Enterprise Access Division (Markham, ON)
 - Solutions used across 25+ countries and targeted towards specific markets
 - VeriSoft software application for fingerprint authentication now included on more than 20 million HP computers
 - Its 3D facial recognition used by the largest casino in the world to provide access control for 12,000+ employees

- AcSys Biometrics (Burlington, ON)
 - Leading-edge provider of facial biometrics technology
 - Offers custom biometric solutions for government agencies and a variety of sectors

Note: Key players identified using RNCOS' report "Global Biometric Market – New Opportunities (2007 – 2010)"

Sources: <http://www.l1id.com/>; <http://www.acsysbiometrics.com/index.html>; Business Wire, January 2008

Capitalizing on Innovation

- Two spin-off companies from innovative research at TR universities with potential applications in biometrics

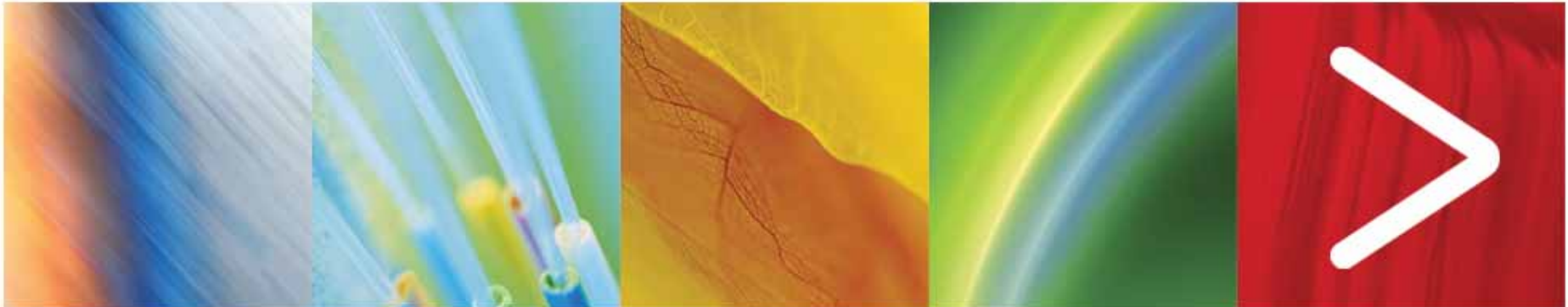
The logo for Opalux features the word "opalux" in a bold, lowercase, sans-serif font. The letters are filled with a vibrant, multi-colored gradient that transitions from purple and blue on the left to red and orange on the right, with a subtle, shimmering effect.

- spin-off from research at the University of Waterloo
- expertise in speech recognition and advanced AI technologies
- potential application in voice recognition biometrics

- spin-off from research at the University of Toronto
- expertise in photonic colour technologies
- potential application in low-power biometrics-based security devices

The logo for Vestec consists of a square icon on the left containing a stylized white checkmark and three curved lines representing sound waves. To the right of the icon, the word "vestec" is written in a bold, lowercase, red sans-serif font. Below "vestec", the tagline "voice enabling systems technology" is written in a smaller, lowercase, grey sans-serif font.

Opportunities in Ontario and Canada



Growing Government Interest

- Interest of government agencies to drive growth of the biometrics market

	What They Are Doing
Citizenship and Immigration Canada (CIC)	<ul style="list-style-type: none"> Now leading a \$26 million Temporary Resident Biometrics Project 15% of temporary residents by late 2011, 50% in 2012, and 100% in 2013
Passport Canada	<ul style="list-style-type: none"> Currently implementing the ePassport program, utilizing facial recognition technology Pilot project began 2009, full national implementation for 2011
Ontario Lottery and Gaming	<ul style="list-style-type: none"> Planning to use facial recognition technology to help keep gambling addicts out of casinos

- Other government agencies currently involved in projects/programs using biometrics include: DRDC, Ontario Ministry of Transportation, RCMP, Correctional Services Canada

Sources: Toronto Sun; Citizenship and Immigration Canada; Passport Canada; Department of National Defence; Canadian IDentity Forum; ITBusiness.ca; Government of Canada, 2008

Summary

- Global leader in our physiological biometrics research
 - Toronto Region is number 2 when compared to other international competitive cities, in terms of impact
- Appropriately trained labour force for budding industry
 - Over 5000 graduates in biometrics-related engineering, math, and science programs
- Increasing global and government interest propelling industry growth and R&D
 - NSERC funding in Ontario for biometrics related projects has increased nine-fold since 1999

For more information, contact us:

**Toronto Region Research Alliance
MaRS Centre, Heritage Building
101 College Street, Suite HL30
Toronto, Ontario M5G 1L7
Email: info@trra.ca
Tel: 1 416 673 6674
Fax: 1 416 673 6671**