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Education

1998: Doctor of Philosophy (PhD), System Design Engineering, University of Waterloo. Autonomy and autonomous agents/robots.
1992: Master of Science (MSc), Computing and Information Science, University of Guelph. Artificial Neural Networks and their application to the automatic conversion of text into speech sounds.
1988: Bachelor of Technology (B Tech), Applied Computer Science, Ryerson Polytechnic Institute.

Employment-Current

Academic

September 1996- Present,
Professor,
Department of Computer Science

I was hired as a tenure-track, Assistant Professor in the Department of Mathematics, Physics and Computer Science. I was promoted to the academic rank of Professor in 2007. As a faculty member, I am responsible for teaching 1 or 2 undergraduate and/or graduate courses per term. These courses include Computer Science 1 in Java, Artificial Intelligence, Autonomous Mobile Systems, Human-Robot Interaction and various Computer Science service courses. I also teach several graduate courses including Research Methods, Presence, Methods of Instruction and a Collaborative Workshop (business team building).

My research program has evolved into one that deals primarily with Computational Public Safety where Computer Science tools and techniques are used to improve public safety processes. My research is highly interdisciplinary, practical and applied. I work closely with both the Urban Search and Rescue (USAR) and Chemical, Biological,

Radiological, Nuclear explosive (CBRNe) Response Team (UCRT) of the Ontario Provincial Police[1] (OPP) and the Heavy Urban Search and Rescue (HUSAR) organization that form part of Canada`s response system to urban disasters.

I serve on (or have served on) many committees at all levels within Ryerson including the Faculty of Science Implementation committee, the Chief Librarian Search committee, Dean-YSGS Search Committee, the Dean-Faculty of Science Search Committee, various Provost working groups and I am one of the longest-serving Senators at Ryerson. I have been an avid supporter of the Science Rendezvous community outreach event (from its inception at Ryerson)--organizing many student volunteers and demonstrations and I have supported several robotics/technology-related clubs in High Schools and one Middle School in the Greater Toronto Area.

July 2016- Present,
Vice Chair-Senate,
Ryerson University
This is the second highest leadership role in Ryerson's Senate--the academic policy making body of Ryerson University. The Senate consists of elected representatives of the faculty, librarians, students and alumni, and ex-officio members of the administration, including the Chancellor. Senate is chaired by Ryerson's President. The Vice Chair is prepared to act on behalf of the Chair when the Chair is unable to do so and is involved in every facet of planning the Senate's agenda.

July 2016- Present,
Graduate Program Director (GPD),
Master of Digital Media (MDM)
Yeates School of Graduate Studies
Master of Digital Media is an intensive 12-month professional graduate program designed to equip graduates with the skills and industry experience they will need as they launch themselves into the digital media world. Whether our students plan to develop their own startup, work in the corporate world or go on to further studies. The program intersects three key areas of digital media: art & design, technology, and business & entrepreneurship. Gaining perspective in each of these areas helps participants tackle problems from innovative angles. The MDM is the first academic program embedded within a university-based business incubator[2]. The GPD is the academic leader of a program and manages all aspects of it.

January 2011- Present
Faculty Liaison,

[1] Ryerson Office of the Vice President-Research and Innovation holds a Memorandum of Understanding (2007) with the OPP that supports collaborative research between the OPP and myself in the area of public safety.
[2] The MDM is embedded within Ryerson's Digital Media Zone (DMZ)—ranked the number one university-based incubator in North America.

Faculty of Engineering and Architectural Science (FEAS), Faculty of Science (FoS) to the Chang School of Continuing Education,
Office of the Deans

Reporting to the Deans FoS, FEAS and the Chang School, the Liaison forms the nexus between the goals and aspirations of disparate Faculties and the Chang School in order to foster dialogue, find synergies and encourage collaboration for the purposes of creating new curriculum, updating existing offerings and generating new revenue.

My responsibilities include identifying opportunities, preparing business cases for and creating new certificate programs, workshops and course series (undergraduate and non-graduate) related to curriculum, interests and competencies from the 2 academic Faculties to the Chang School. This role includes leading Chang school staff in developing delivery and governance models as well as working with stakeholders to define course offerings that are high quality, academically sound and popular with continuing education learners. Once a program is running, I am responsible for finding and hiring competent contract instructors to teach the required courses. To date, I have substantively[3] contributed to the definition, creation and/or revision of the programs/course series/workshops listed below:

1. Data Analytics, Big Data and Predictive Analytics[4] (Certificate, FEAS and FoS)
2. Computer Security and Digital Forensics (Certificate, FoS)
3. Disaster and Emergency Management (Certificate, FoS)[5]
4. Energy Management and Innovation (Certificate, FEAS)
5. Financial Mathematics Modeling (Certificate, FoS)
6. Infrastructure Asset Management and Renewal (Certificate, FEAS)
7. Project Management for Mid-Level Managers in the Technical Sector (Certificate, FEAS)
8. Program and Portfolio Management (Certificate Renewal, FEAS)
9. Project Management (Certificate Renewal, FEAS)
10. Robotics and Embedded Systems (Certificate, FoS and FEAS)[6]
11. Sustainability Management and Process Excellence (Certificate Renewal, FEAS)
12. Course Series in Computer Applications (FoS)
13. Course Series in The Human Body (FoS)
14. Course Series in Transportation Logistics (FEAS)
15. Course Series in Project Management (FEAS)
16. Course Series in CATIA[7] Engineering Design (FEAS)
17. Non-Technical Workshops for Technologists and Technicians in the Technical Sector (FEAS)
18. Commercial Unmanned Aerial Vehicle (UAV) Ground School (FoS)

February 2014 - Present

[3] Written, revised or collaboratively created
[4] I share the academic coordinator role in this program with Prof. Ayse Bener (Mechanical and Industrial Engineering).
[5] This is the only D&EM program housed within a Department of Computer Science in the World.
[6] This Certificate program is a collaboration across 2 Faculties (FEAS and FoS) and 3 Departments (CS, Mech/Ind Eng and E&CE)
[7] Computer Aided Three-dimensional Interactive Application (CATIA)

Academic Co-coordinator--Certificate Program in Data Analytics, Big Data & Predictive Analytics
The G. Raymond Chang School of Continuing Education, Ryerson University
All private and public sector organizations are recognizing the competitive advantage of "Big Data" – the ability to analyze large data sets – and are increasingly demanding professionals who have advanced competencies in data analytics, statistics, and predictive analytics. This certificate focuses on direct, practical application of skills and techniques, while providing sound academic and technical education in data analytics with big data. The certificate provides a strong foundation in analytics, tools, and statistics. The certificate is a collaboration between FEAS, FoS, the departments of Mechanical and Industrial Engineering (academic home of the certificate), Computer Science, Mathematics, and The Chang School. As the co-academic coordinator I am responsible for the quality, delivery and management of the program.

March 2012 - Present
Academic Coordinator - Robotics and Embedded Systems Certificate Program
The G. Raymond Chang School of Continuing Education, Ryerson University
This certificate program provides adult learners with hands-on opportunities to acquire knowledge and skills that will permit them to contribute and respond effectively to our collective societal need to provide innovation through advances in robotics and embedded systems product and device development. The Certificate is a collaboration between FEAS, FoS, the departments of Computer Science (academic home), Mechanical and Industrial Engineering, Electrical and Computer Engineering, and The Chang School. As the academic coordinator I am responsible for the quality, delivery and management of the program.

February 2012 – Present
Academic Coordinator, Computer Security and Digital Forensics Certificate Program
The G. Raymond Chang School of Continuing Education, Ryerson University
The Certificate in Computer Security and Digital Forensics will be of interest to individuals just starting their career; career changers seeking to achieve advancement, portability, and longevity goals; managers and end users requiring a more in-depth understanding of computer security and data protection; and long-time practitioners seeking to round out their knowledge and attain a recognized level of academic achievement. The Certificate is a collaboration between the FoS, the Ted Rogers School of Management (TRSM) and the departments of Computer Science (academic home), the Law Practice Program, and The Chang School. As the academic coordinator I am responsible for the quality, delivery and management of the program.

February 2012 – Present
Academic Coordinator, Disaster and Emergency Management Certificate Program
The G. Raymond Chang School of Continuing Education, Ryerson University
This program is designed to prepare participants to act as members of a multi-disciplinary team involved in, planning for, and dealing with emergency incidents. The

fundamental goal of this certificate is to introduce participants to best practices including risk assessment and risk mitigation, pre- and post-disaster planning, including business contingency planning, effective communication guidelines, pre- and post-disaster mitigation, on-the-ground operations, and follow through in search, rescue, response, and recovery. The curriculum emphasizes the knowledge, processes, tools, and mechanisms necessary to ensure that disaster and emergency management projects are executed using best practices and success-proven procedures. As the academic coordinator I am responsible for the quality, delivery and management of the program.

The Certificate's academic home is the departments of Computer Science—perhaps the only disaster and emergency management program associated with such a department. Over the past several years, the program has become a gateway for demobilized Canadian Forces veterans to receive retraining while taking advantage of their existing skill sets. Several Certificate graduates have gone on to senior leadership roles in various emergency management agencies. In addition, several graduates now regularly teach in the program.

September 2000- Present
Adjunct Professor
School of Computer Science
The University of Guelph
I collaborate with regular faculty members within the school and am involved in graduate education.

November 2012 – Present
Adjunct Professor
Department of Computing and Software
McMaster University
I collaborate with regular faculty members within the school and am involved in graduate education.

Employment-Past
Academic
January 2013- December 2016,
Director-Professional Graduate Diploma Programs (D-PGDP),
Yeates School of Graduate Studies (YSGS),
Office of the Dean
Reporting to the Dean-YSGS and working with all program stakeholders, the D-PGDP leads the team effort in ideation, definition, creation and launch of cost-recovery, graduate programs leading to Ryerson`s newest credential--the Professional Masters Diploma (PDip). I was instrumental in all aspects leading to these successful programs:

1. Aerospace Design Management

2. Dietetics
3. Enterprise Information Security, Privacy and Protection
4. Energy and Innovation
5. Finance for Social Innovation
6. Accounting
7. Management of Technology and Innovation
8. Canadian Business

The PDip initiative represents the largest expansion of cost-recovery graduate programming that Ryerson has ever attempted and is the first collaboration between YSGS and the G. Raymond Chang School of Continuing Education.

July 2007- June 2016,
Graduate Program Director (GPD),
Associate Chair,
Department of Computer Science
The GPD is responsible for all aspects of the Masters and Doctoral Programs in Computer Science. I am the founding GPD and lead the Department's efforts to establish high quality graduate programs. I author all Letters of intent (LoI), briefs, rebuttals and responses to internal and external reviewing and authorizing bodies for both programs. The programs received permission to run from the Province of Ontario in 2007 and 2011 for the MSc and PhD programs respectively.

September 1992 - June 1996, Instructor,
Continuing Education (now the Chang School),
Ryerson Polytechnic University.
I presented one or two evening courses for the School of Computer Science each semester. These included, Data Structures, Structured Programming in C and a course in Soft Computing and Artificial Intelligence.

Jan 1996 - August 1996
Associate Director,
Intelligent Network Solutions,
Bell Global Solutions (a subsidiary of Bell Canada).
Reporting to the Vice President of Intelligent Network Solutions, I was responsible for scouting technology, resources and new markets for Bell Global Solutions and Bell Canada's Network-centric solutions. I also provided system integration and development services on a contract basis to other Bell organizations. My primary focus was the development of Bell's Call Centre and interactive voice response (IVR) strategies through the use of an intelligent national network. I was one of several team leader who worked with a diverse set of technical, management and client organizations to "craft" complex services into purchasable packages that addressed client needs.

Mar 1995 - Jan 1996

Technology Consultant,
Technology Department,
Bell Sygma Inc. (a subsidiary of Bell Canada).
Reporting to the Vice President for technology, my primary responsibilities were the investigation, prototyping and dissemination of leading-edge technology to the rest of Bell Sygma and Bell Canada. I was responsible for Bell Canada winning several contracts deploying its networks to various government organizations. I was also responsible for forging alliances with academic institutions including the Universities of Toronto and Waterloo.

April 1992 - Mar 1995, System Analyst,
PERMITS project,
Bell Sygma Telecom Solutions (a subsidiary of Bell Canada).
The Project Estimate Resource Management Information Tracking System (PERMITS) was a large Ingres relational database application spanning two provinces and supporting over 2000 users across Bell Canada. I was responsible for the maintenance and validation of all system reference tables, supplying program specifications, code enhancements and bug fixes. I was extensively involved in an effort to reverse engineer the project in order to better document the application's function as well as to look for opportunities to improve its performance.

September 1990 - April 1992, System Manager - Budgets and Results,
Expense District, Residential Sales and Service,
Bell Canada.
I was responsible for the day-to-day operation of a VAX 6000-310 minicomputer running an Ingres application tracking budget and result information for Bell Ontario. One of my primary responsibilities was the rollout of the project to our client communities. The task required a detailed understanding of Bell's internal communication backbone, including its technological foundation, as well as an appreciation for each client's particular needs. The position required a sound knowledge of system management practices, VAX/VMS architecture, and data communications principles.

April 1990 - September 1990, Office Systems Associate,
Systems Technology, Operations Development,
Bell Canada.
This position required me to perform the initial evaluations of graphical user interface standards within Bell Canada. I worked to understand the technology available and the requirements of the Bell user community and make recommendations for technology adoption. Secondary responsibilities included chairing requirements and program walk-through meetings to bring various internally developed VM/CMS applications into production.

May 1988 - April 1990, Information Services Support Centre Associate,

Systems Development, Corporate Systems Organization,
Bell Canada.
Initially I was responsible for the site management of a development laboratory primarily equipped with VAX, PDP, Sun and Tandem computers. The position eventually evolved into one requiring me to develop applications for internal clients--primarily in the FORTRAN and C programming languages. My general responsibilities included providing day-to-day management of the lab, performing hardware and software evaluations and, provisioning an effective disaster recovery plan.

Part time:
October 2008 – October 2010
Auxiliary,
Ontario Provincial Police (OPP) – USAR and CBRNe Response Team (UCRT)
An Auxiliary member of the OPP is responsible for assisting regular police officers within the OPP in the completion of their duties. The Urban Search and Rescue (USAR) and Chemical, Biological, Radiological, Nuclear explosive (CBRNe) Response Team (UCRT) requested that I become an Auxiliary as there were certain aspects of our research collaboration which required my actual membership as an official volunteer within the OPP (to achieve standing). This relationship culminated in 2010 during the devastating Earthquake in Haiti when I was on 4-hour standby to accompany the UCRT to Haiti on their expected deployment[8].

June 1980 - November 1994
Company Commander,
Combat Service and Support Company,
The Royal Regiment of Canada,
Canadian Forces Primary Reserve.
For fourteen years, I was a member of this infantry battalion. Having joined as a private soldier and progressing through the ranks, I held every appointment within an infantry Company--retiring with the rank of Captain and was appointed to the senior leadership role within a Company—Officer Commanding. During my career, I took many courses on leadership, management and instructional technique. I was provided with many opportunities to apply this knowledge in very practical settings in some interesting situations and parts of the world. In the role of Company Commander, I was responsible for the administration, management and leadership of over 120 personnel under operational conditions. I received the Canadian Forces Decoration (CD) in 1992.

Consulting Positions
October 2004 – 2009
Scientific Research and Experimental Development (SR&ED)
I act as a technical advisor to clients who wish to participate in the federal government's SR&ED program providing advice on how applied research, conducted

[8] The deployment was scrubbed shortly thereafter.

within an organization, can be formalized and documented to qualify for government rebates (SR&ED) and assistance (IRAP).

September 2002 – January 2003
HumCorp Networks Inc.
I, and graduate students within the NCART lab, worked with the Chief Technology Officer of this company to introduce a new wireless product to the European market related to multipoint voice communications in the 900 MHz band.

November 2001 - May 2002
Sick Children's Hospital
I and several members of N-CART worked with Dr. Bill Williams, the Chief Cardiologist at Sick Children Hospital and the Congenital Heart Surgeon's Society to develop their first on-line survey for collecting information related to surgical conduit implants in infants. The goal of the study was to determine why there is a high rate of failure of implants within two years of the initial procedure in very young children. In the past, such a study would have been conducted by FAX or mail however, this study allowed participating institutions to directly and securely enter patient and surgical data into a central data repository using any web browser and a phone. The technology was new to the hospital and this was a first-of-a-kind demonstration project.

May 2000 - January 2001
Moby Dark Inc.
I, and members of the N-CART lab, were engaged to conduct an investigation into the deployment of new wireless devices into the consumer market based around Moby Dark's wireless router technology and the N-CART labs Heating Ventilation and Air Conditioning (HVAC) monitoring prototype.

February 1999 - September 2000
Personification Inc.
I was engaged as the project manager for a large development effort associated with reasoning and personalization engines being developed for Bell Canada. I eventually became part of the company's marketing and sales groups, acting as the system architect for various Internet-based audio products. In addition, I supported marketing and sales efforts through the creation of compelling demonstrations, presentations and other collaterals.

September - October 1998
Bell Canada
As part of their due diligence effort I was engaged by Bell to help architect the relationship that Bell would have with the Universities of Toronto and Waterloo in its effort to create the "Bell Canada University Labs". My task was to bridge the gap between the competitive world of telephony and academia. The project involved the philanthropic transfer of $21M to these universities.

October 1997 - July 1998
Berkshire Investment Group
I was involved in the selection of a new brokerage back-office system for the company as well as helping to devise a consistent and effective Internet strategy. In addition, I developed several utility programs to work around problems associated with their back-office system.

February - October 1997
Systems Group
AIC Group of Funds
I was engaged to implement an interactive voice response (IVR) system coupled to the corporate transaction engine (AS400). The intent was to free human resources within the existing call centre from answering simple questions related to AIC's fund prices. The solution was highly successful and resulted in a significant saving in both time and money and improved functionality. In addition, I was involved in training and implementing procedures within the group and advised Mr. Michael Lee-Chin (the owner) on the strategic use of information technology as a competitive tool.

Teaching

Courses Presented (Last 10 years)[9]

Course	Title	Level	Students	Dates
CPS813	Human Robot Interaction	Undergraduate	11	2016-17
MDM Milestone	Collaborative Workshop	Graduate	38	
CPS109	Computer Science 1	Undergraduate	85	2015-16
DG8010	Selected Topics in Digital Media	Graduate	6	
CPS813	Human Robot Interaction	Undergraduate	15	
CP8101	Research Methods for Computer Science	Graduate	17	2014-15
CPS109	Computer Science 1	Undergraduate	100	2013-14
CP8101	Research Methods for Computer Science	Graduate	21	2012-13
CPS109	Computer Science 1	Undergraduate	99	
CKDM100	Principles and Practices of Emergency Management	Continuing Education	6	
CPS109	Computer Science 1	Undergraduate	105	2011-12
CP9101	Method of Instruction	Graduate	7	
CP8306	Presence	Graduate	3	2010-11
CP8101	Research Methods for Computer Science	Graduate	18	
CPS109	Computer Science 1	Undergraduate	145	2009-10
CP8101	Research Methods for Computer Science	Graduate	20	
CP8101	Research Methods for Computer	Graduate	23	2008-9

[9] Teaching evaluations are available on request. An informal measure of effectiveness can be found at: http://www.ratemyprofessors.com/ShowRatings.jsp?tid=7490 providing an overall quality rating of 4.7/5.0

	Science			
CP8101	Research Methods for Computer Science	Graduate	23	2007-8
CPS125	Digital Computation and Prog	Undergraduate	61	2006-7
CPS607	Autonomous Mobile Systems	Undergraduate	27	
CPS841	Advanced Topics in Computer Science		17	

Graduate Student Supervision (Career total)

Name	University	Department/Program	Degree	Start	End
Hannah, Dalia	Ryerson	Comp. Sci.	PhD	2016	TBD
Hashim, Ahamed Umar	Ryerson	Master of Digital Media	MDM	2016	TBD
Tencer, Ashley	Ryerson	Master of Digital Media	MDM	2016	TBD
Gonzalez, Nuria	Ryerson	Master of Digital Media	MDM	2016	TBD
Fraser, Danielle	Ryerson	Master of Digital Media	MDM	2016	TBD
Brennan, Lindsay	Ryerson	Master of Digital Media	MDM	2015	2016
Appleby, Aaron	Ryerson	Master of Digital Media	MDM	2015	2016
Fernando, Alexandra Julia	Ryerson	Master of Digital Media	MDM	2015	2016
Cohen, Matthew	Ryerson	Master of Digital Media	MDM	2015	2016
Blain, Rob	Ryerson	Master of Digital Media	MDM	2015	2016
Tran, Nhan	Ryerson	Comp. Sci.	PhD	2015	TBD
Djafarova, Naza	Ryerson	Comp. Sci.	PhD	2015	TBD
Chan, Christopher	Ryerson	Comp. Sci	PhD	2015	TBD
Bains, Gurjit	Ryerson	TRSM	MBA	2014	2014
Waismark, Ben	Ryerson	Comp. Sci.	MSc	2014	2017
Zouri, Muthana	Ryerson	Comp. Sci.	PhD	2013	TBD
Ufkes, Alex	Ryerson	Comp. Sci.	PhD	2013	TBD
Chan, Christopher	Ryerson	Comp. Sci.	MSc	2013	2015
Kong, Christopher	Ryerson	Comp. Sci.	MSc	2012	2014
Herman, Scott	Ryerson	Comp. Sci.	MSc	2011	2013
Ufkes, Alex	Ryerson	Comp. Sci.	MSc	2010	2013
Shah, Waqas	Ryerson	Comp. Sci.	MSc	2010	2012
Brian Pham	Guelph	Comp. and Info Sci.	PhD	2009	2013
D'Souza, Andrew	Ryerson	Comp. Sci.	MSc	2009	2011
Tran, Jimmy	Ryerson	Comp. Sci.	PhD	2009	TBD
Gerdzhev, Martin	Ryerson	E&CE	MSc	2008	2010
Sharieh, Salah	Ryerson	Comp. Sci.	MSc	2007	2008
Bokhari, Saadat	Ryerson	Comp. Sci.	MSc	2007	2009
Somers, Vijay	Ryerson	E&CE	MSc	2007	2009
Rahnama, Hossein	Ryerson	E&CE	PhD	2006	2010
Coleshill, Elliott	Guelph	Comp. and Info Sci.	PhD	2004	2010

Ribeiro, Cristina	Guelph	Comp. and Info Sci.	MSc	2006	2008
Sommers, Vijay	Ryerson	Comp. Sci.	MSc	2007	2009
Tran, Nhan	Ryerson	Comp. Sci.	MSc	2009	2011
Tran, Jimmy	Ryerson	Comp. Sci.	MSc	2007	2009
Arora, Ankit	Ryerson	E&CE	MSc	2003	2005
Lac, Hao	Guelph	Comp. and Info Sci.	MSc	2002	2004
Nguyen, Le	Guelph	Comp. and Info Sci.	MSc	2003	2005
Lu, Wei	Guelph	Comp. and Info Sci.	MSc	2001	2003
Pham, Justin	Guelph	Comp. and Info Sci.	MSc	2003	2005
Klotz, Greg	Guelph	Comp. and Info Sci.	MSc	2002	2004
Coleshill, Elliott	Guelph	Comp. and Info Sci.	MSc	2001	2003
Shiu, Wing	Guelph	Comp. and Info Sci.	MSc	2001	2003

Postdoctoral Supervision

Name	Start	End
Dr. Cheryl To	June 2017	Present
Dr. Fatima Hussain	Sept 2016	Present
Dr. Md Altab Hossain	Sept 2015	Present

Graduate Examination Activity (Last 5 years)

Student	Degree	Program	Event	My Role	Year
Karim, Raed	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Chair	2013
Ahmed, Lubaid	PhD	Ryerson, Comp. Sci.	Oral Examination	Examiner	2013
Tran, Jimmy	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Examiner	2013
Khojasteh, Haleh	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Chair	2013
Seifzadeh, Alireza	PhD	Ryerson, Mech. & Ind. Eng.	Oral Examination	Chair	2014
Poon, Wilson	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Chair	2014
Abdullah, Alaa	PhD	Ryerson, E & Comp. Eng.	Oral Examination	Chair	2014
Harishankar, Ssowjanya	MSc	Ryerson, Comp. Sci.	Oral Examination	Chair	2014
Khan, Mohammad	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Chair	2014
Khan, Nargis	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Chair	2015
Habibi, Khashayar	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Chair	2015

Mohamed, Richard	PhD	Ryerson, Aerospace Eng	Oral Examination	Chair	2015
Rabbou, Mahmoud Abd	PhD	Ryerson Civil Eng.	Oral Examination	Examiner	2015
Almeshary, Meshary	MSc	Ryerson, Comp. Sci.	Oral Examination	Chair	2015
Papanicolau, Naum	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Chair	2015
Firdaus, Syeda Nadia	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Chair	2016
Byagowi, Ahmad	PhD	U. Manitoba, E. & Comp. Eng.	Oral Examination	External Examiner	2016
Murphy, David	PhD	Ryerson, Communication and Culture	Oral Examination	Chair	2016
Chan, Christopher	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Examiner	2016
Zouri, Muthana	PhD	Ryerson, Comp. Sci.	Comprehensive Exam	Examiner	2016
Powell, Jeffery Alexander	PhD	Ryerson, Mech. Eng.	Oral Examination	Chair	2017
Jakubovic, Raphael	PhD	Ryerson, Medical Physics	Oral Examination	Chair	2017

Research Interests

- Robotics (ground, water and air)
- Autonomous Systems
- Teleoperation, telepresence, computer-machine mediation systems
- Mechatronics,
- Human Factors
- Response Robotics
- Non-intrusive technological augmentation of service animals
- Computational Public Safety (Specifically, USAR, EDU and CBRNe response)
- Canine olfaction, behavior and augmentation
- Disaster and Emergency Management

Experience

September 1997 - Present
Director of Research
The Network-Centric Applied Research Team (N-CART)
School of Computer Science
Ryerson University

As the research director, I provide direction to a mixed team of approximately a dozen Doctoral and Masters students, several Post Docs and a strategic advisor. The lab performs applied research in the area of computational public safety. Our specializations are Urban Search and Rescue (USAR) response and Chemical, Biological, Radiological and Nuclear Explosive (CBRNE) incident response.

Current and past sponsors include, NSERC, Public Safety Canada, The Ontario Provincial Police, Bell Canada, Bell Global Solutions, Bell Sygma, Apple Canada and Moby Dark. In 2007 N-CART was recognized by the Ontario Government for research excellence--receiving both the Gold and Diamond Showcase Awards for Excellence in Project Achievement for the Canine Augmentation Technology (CAT) project.

January 1991 – 2000
Primary Investigator - Autonomous Systems
The Natural Selection Research Group
Department of Computing and Information Science
University of Guelph
The group was established By Dr. Deborah A. Stacey to further research in the areas of machine intelligence in various forms including genetic algorithms, artificial neural network, fuzzy systems and mobile robotics. The group has worked extensively with such organizations as the Department of National Defence, Ontario Hydro, and many others. My research interests have included text-to-speech processing using neural networks, sonar target identification, and speech recognition. I was the group's primary investigator in the area of robust intelligent autonomous systems.

September 1993 - October 1997
Member
Pattern Analysis and Machine Intelligence Group (PAMI)
Department of Systems Design Engineering,
University of Waterloo
The PAMI group was established in 1980 with the objective of providing resources to researchers in the areas of pattern analysis and machine intelligence and to promote technology transfer between the university and industry. My own work as a graduate student centered on the application of simple, robust neural networks to the field of autonomous agents-especially fast learning.

September 1990 - May 1992
Associate
Human-Computer Interaction Design Lab
Department of Computing and Information Science
University of Guelph
Under the direction of Dr. Tom Carey, the goal of the HCI design lab was to further the understanding of how humans interact with computing machinery. Interests in the lab were far ranging, encompassing fields such as computer supported cooperative work,

usability testing, and HCI design tools. I contributed to various user and product studies including the IBM Book Manager and Bell Northern Research VISIT usability studies.

Significant Projects (Last 10 years)

Project	Description	Dates	Collaborators
Canine Augmentation Technology (CAT) 	CAT is a suite of technologies that augment an Urban Search And Rescue (USAR) dog's natural ability as an excellent mobility and sensor platform. By adding cameras, accelerometers, microphones, computing, lights and wireless networking, CAT allows remote humans to track and observe the progress of a searching dog when humans a precluded from following. It was first deployed operationally at a realistic disaster training exercise in Fergus Ontario by the canine teams of the OPP and Toronto HUSAR. The technology has undergone substantial revisions based on feedback from canine handlers and search team managers.	2006-Present	Ontario Provincial Police (OPP), Toronto Police Services (TPS), Toronto Heavy Urban Search and Rescue (HUSAR), Federal Emergency Management Agency (US FEMA) canine subcommittee, Ryerson School of Fashion, Ryerson Mechanical and Industrial Engineering, Natural Sciences and Engineering Research Council (NSERC)
Canine Remote Deployment System (CRDS) 	This patented device is a canine-carried, release mechanism designed to be easily integrated into a canine harness originally intended for use with CAT systems but has been used with CANES and CARD as well. The current version of the CRDS is carried by the USAR canine teams of the OPP and has been deployed to Lebanon by a U.S. non-governmental agency	2007-2016	OPP, TPS, Toronto HUSAR, FEMA canine subcommittee, Ryerson School of Fashion, Ryerson Mechanical and Industrial Engineering, Field Innovation Team (FIT)-Utah, USA
Canine Automatic Network Extension System (CANES)	CANES is a method for deploying wireless radio equipment (repeaters or mesh routers) around and under disaster rubble piles. As radio signals propagate around an antenna, we discovered that radio signals under rubble can be detected through the rubble and may be useful in locating trapped individuals by searching for an appropriate radio signal. More recently we have been running experiments deploying mesh routers from dogs using our CRDS technology and wired tethers (see CARD).	2008-2012	OPP, TPS, Toronto HUSAR, FEMA canine subcommittee, Ryerson Electrical and Computer Engineering, FEMA Texas USAR Task Force 1 canine teams, Ontario Centres of Excellence (OCE)
Canine Assisted Robot Deployment (CARD)	CARD is a refined version of CANES, allowing canine teams to drop robots on or near entombed victims of a collapse. The system is capable of releasing many different types of robots including, in one case, an 11 lbs. tethered snake robot developed at Carnegie Melon University	2012-Present	OPP, CMU Robot Institute, FEMA Ohio USAR Task Force 1 canine teams, FEMA Texas Task USAR Force 1 canine teams, OCE

	(CMU)		
Disaster Scene Reconstruction (DSR) 	The focus of DSR is the creation of data collection, visualization and simulation tools capable of interacting to create virtual models of disaster scenes that can be manipulated to answer "what if" questions before a rescue is attempted in an USAR rubble environment. DSR is a methodology for sensing, recording, modelling and making serious, rule-based games of real disaster scenes.	2013-Present	OPP, Toronto HUSAR, FIT, IMR Systems Inc., DRDC
Automatic Access Hole Finding 	The structural collapse of building may cause people to become trapped underneath rubble. Emergency workers responding to such disasters are tasked with searching for and extracting trapped victims. An important step in the process involves searching for trapped victims and access points that may lead rescuers into under rubble voids. Our work aims to speed up and relieve some of the work first responders are tasked with by autonomously detecting access holes which may lead to voids in the rubble.	2013-Present	OPP, Toronto HUSAR
Explosive Disposal Unit-Simulation Training (EDUST) 	The training of EDU personnel is often expensive and complex involving the use of specialized disruption equipment, hours of experimentation and some risk. In this project we use methodology learned from DSR and apply it to the improvised explosive device (IED) neutralization task.	2015-Present	OPP, Toronto Police Services

Grants and Gifts

Granting Agency	Start	Duration	Amount	Topic	Notes
NSERC Discovery	2017	1 yr	$21000	Unmanned Terrestrial Inspection of Bridge Infrastructure Using Image Processing Techniques	
Faculty of Science Interdisciplinary research grant	2017	1 yr	$12000	El-Hibeh Archaeological Dig Site, Egypt--looter tunnel exploration robot creation fund	In collaboration with Dr. Jean Lee (Prof. Dept of History, Faculty of

(Internal)					Arts, Ryerson U)
Faculty of Science Dean's Travel Grant (Internal)	2017	1 mth	$1000	Attend and participate in DHS/NIST/ASTM "Response Robot Evaluation" Exercise	FEMA VA-TF2 training facility, Virginia Beach, Virginia, USA
Faculty of Arts Interdisciplinary undergraduate research assistant (Internal)	1017	4 mths	$9,888.20	An algorithmic approach to defining search algorithms for unmanned aerial vehicles (UAVs) engaged in the "lost and wandering" external-to-facility-grounds patient search task.	In collaboration with Dr. Janet Lum (Associate Dean, Faculty of Arts, Ryerson U)
eCampus Ontario Research and Innovation Grant	2017	1 yr	$95,942[10]	Practical Design Guide for Simulation Game-Based Learning	In collaboration with the G. Raymond Chang School of Continuing Education and Prof. Ozgur Turetken, Chair, BTM, The Ted Rogers School of Management, Ryerson
G. Raymond Chang Family	2016	NA	$25,000.00	Canine applications for Computational Public Safety	Research Gift
NSERC (Engage)	2016	6 mths	$25,000.00	Inter/Intranet manufacturing machine monitoring (I2M3)	With Ivedha Inc.
NSERC (Engage)	2015	6 mths	$25,000.00	Omni-directional canine camera system	With MAXgear Inc.
NSERC (CREATE)	2015	6 yrs	$1,650,000.00[11]	ADERSIM Project	
Microsoft Canada	2014	NA	$25,000.00	Embedded Systems Grant	USD, Research Gift
NSERC (Engage)	2014	6 mths	$25,000.00	Confined Space Flight Software Assist	With DreamQii Inc.
NSERC (Engage)	2013	6 mths	$25,000.00	Sensor mount for UAV for scanning urban disaster scenes.	With the AeroX company.
NSERC (Engage)	2010	6 mths	$25,000.00	An Algorithm for Determining Acceptable Personal Space	With InteraXon Inc.

[10] I am 1 of 9 "partners" in the project lead by my Doctoral Student, Naza Djafarova
[11] I am 1 of 11 primary investigators in this York University-centred grant

NSERC (Engage)	2010	6 mths	$25,000.00	Dual Function Pressure Pipe Inspection Sensor Head	With Pressure Pipe Inspection Company
NSERC (Discovery)	2010	5 yrs	$155,000.00	Human Interface for Canine Augmentation Technology Data	
Ontario Centres of Excellence (Photonics)	2008	6 mths	$15,000.00	Untethered near-infrared brain spectroscopy to monitor canine brain function.	
Ontario Centres of Excellence (Communication and Information Technology)	2008	6 mths	$13,703.00	Algorithm for the Automatic Placement of Nodes to extend emergency wireless networks.	
OPIC	2008	3	$25,000.00	Canine Remote Deployment System Market Readiness	
OPIC	2007	1	$10,000.00	CAT Demonstration Project at HUSAR exercise with OPP/PERT	
NSERC (EQPEQ program)	2007	1 yr	$44,338.00	Vision-based micro-manipulation system for autonomous inspection and assembly of micro-parts	
Ontario Provincial Police	2005	Ongoing	$20,000.00	Canine Augmentation Technology/ Improved Urban Search and Rescue Robotics/ improve CBRNe response robots	in kind, per year
Dog-Goes	2005	1 yr	$2,000.00	Canine USAR	in kind
Invacare	2003	2 yr	$15,000.00	Network-Enabled Powered Wheel-Chair Adaptor Kit Prototype (3 Powered Wheelchairs donated)	in kind
Microsoft Canada	2003	NA	$25,000.00	Network-Enabled Powered Wheel-Chair Adaptor Kit Prototype	USD
HumCorp Networks Inc.	2002	1 yr	$2,000.00	Network Routing Research	in kind
Moby Dark Inc.	2000	4 mths	$2,000.00	Collaborative Research Grant - Network-centricity	
NSERC (Discovery)	2000	4 yr	$48,000.00	Distributed Network Services for Remote and Teleoperated Systems	
Department of Foreign Affairs and International	1999	4 days	$10,000.00	Sponsored "Team Canada" participant on research mission to Japan to demonstrate the	

Trade				Internet robot project: MAX	
Bell Global Solutions	1998	2 mths	$6,000.00	Competition Study - Fax services	
NSERC (Discovery)	1998	2 yr	$18,000.00	Autonomous Systems	
Active Surplus Annex	1997	1 yr	$500.00	Sumo Robot Design in collaboration with Ontario College of Art and Design artist Norman White	in kind
Bell Canada	1996	2 yr	$1,000.00	Telephone Line	in kind
Bell Sygma Inc.	1996	1 yr	$23,000.00	Equipment Grant	in kind
Apple Canada	1996	1 yr	$4,500.00	Apple Newton PDA Study	
Bell Sygma Inc.	1996	1 yr	$1,000.00	Personal Digital Assistants	
Ryerson Starter Grant	1996	1 yr	$5,000.00	Personal Digital Assistants	

Dissemination (Career totals unless otherwise stipulated)

Book Chapters

- **S. Sharieh**, F. Franek and A. Ferworn, “Mobile Functional Optical Brain Spectroscopy over Wireless Mobile Networks Using Near-infrared Light Sensors”, in *Data Acquisition*, ISBN 979-953-307-817-4, INTECH, 2012
- A. Ferworn, “Canine Augmentation Technology for Urban Search and Rescue” in *Canine Ergonomics – The Science of Working Dogs*, William S. Helton (Ed.), CRC Press Taylor and Francis Group, 2009, Boca Raton, Florida, USA, ISBN: 978-1-4200-7991-3.
- A. Ferworn, K. Plataniotis, “Teleoperation Over the World Wide Web” in *Robotics and Applications*, M.H. Hamza (Ed.), Acta Press Series on Robotics and Manufacturing, 1999, Calgary, Alberta, Canada, ISBN: 0-88986-265-6 (304).

Journal Papers

- M. S. Islam, M. R. Islam, M. A. Hossain, A. Ferworn, M. K. I. Molla. “Subband entropy-based features for clothing invariant human gait recognition”, Advanced Robotics, 1-12, http://dx.doi.org/10.1080/01691864.2017.1283249, February (2017)
- **C. Kong**, A. Ferworn, **E. Coleshill**, **J. Tran**, and K.G. Derpanis. "What is a Hole? Discovering Access Holes in Disaster Rubble with Functional and Photometric Attributes." Journal of Field Robotics (2015)
- F. Butt, **S. S. Bokhari**, A. Abhari, and A. Ferworn. "Scalable Resource Discovery through Distributed Search." International Journal of Distributed and Parallel Systems (IJDPS) 2.5 (2011): 1-19

- **C. Ribeiro**, A. Ferworn, M. Denko, and **J. Tran,** "Wireless Mesh Network Performance for Urban Search and Rescue Missions", International Journal of Computer Networks & Communications (IJCNC), 2010, Vol 2, Issue 2, pp. 38-57
- L. Dell'Agnese and A. Ferworn, "Work Apparel for Urban Search and Rescue Dogs", Descant, Volume 40, No. 1, pp. 73-81, 2009
- A. Ferworn, D. Ostrom, K. Barnum, M. Dallaire, D. Harkness, and M. Dolderman, "Canine Remote Deployment System for Urban Search and Rescue", Journal of Homeland Security and Emergency Management: Vol. 5 : Iss. 1, Article 9. 2008
- A. Ferworn, **A. Arora**, and M. Jaseemuddin, IP Mobility Issues for a Mobile Tele-Robotic System - NEPWAK, International Journal of Automation and Computing, Special Issue of Online Robots and E-automation, 2004.

Refereed Conferences, Workshops, etc.

- **N. Tran**, **M. Zouri** and A. Ferworn, "Computational Public Safety: The Evolution to Public Safety Research", 20th International Conference on Network-Based Information Systems (NBiS-2017), 24-26 August 2017, Toronto, Canada.
- **C. Chan**, A. Ferworn, and D. Tran "A Rudimentary Approach to Unmanned Aerial Vehicle Guided Improvised Explosive Device Shrapnel Dispersal Simulation" International Conference on Intelligent Networking and Collaborative Systems (INCoS), 24-27 August 2017, Toronto, Canada
- **B. Waismark**, A. Ferworn, and **J. Tran**, "Enhancing Autonomous Access Hole Detection", IEEE International Humanitarian Technology Conference (IHTC), 20-21 July 2017, Toronto, Canada
- **C. Chan**, A. Ferworn, and L. Chin, "Towards Determining Relative Densities for Common Unknown Explosives in Improvised Explosive Devices", IEEE International Humanitarian Technology Conference (IHTC), 20-21 July 2017, Toronto, Canada
- F. Hussain , H. Farahneh, X. Fernando and A. Ferworn, "VLC Enabled Foglets Assisted Road Asset Reporting", 2017 IEEE 85th Vehicular Technology Conference (VTC2017-Spring), 4–7 June 2017, Sydney, Australia
- **D. Hanna**, A. Abhari, and A. Ferworn, "Recommending open educational resources based on user comments", Proceedings of the 20th Communications and Networking Simulation Symposium (CNS 2017) of SCS/ACM, April 23-26, Virginia Beach, VA, USA, 2017
- F. Hussain and A. Ferworn, "Distributed Slot Allocation in Capillary Gateways for Internet of Things Networks", The 84th IEEE Vehicular Technology Conference (VTC2016), 18–21 September 2016, Montréal, Canada
- **C. Chan** and A. Ferworn, "Serious Gaming for Improvised Explosive Device Neutralization Training", The 3rd International Conference on Industrial Engineering and Applications (ICIEA 2016), 5-7 June 2016, Hong Kong, MATEC Web of Conferences. Vol. 68. EDP Sciences, 2016
- **B. Waismark**, A. Ferworn, "CAT 360 - Canine Augmented Technology 360-Degree Video System", IEEE International Workshop on Safety, Security & Rescue Robotics (SSRR-2015), Purdue University, West Lafayette, Indiana, USA, October 18-20, 2015

- A. Ferworn, **S. Herman**, **C. Kong**, **A. Ufkes**, **J. Tran,** "Interacting with a Virtual Destroyed Environment Constructed from Real Disaster Data", IEEE International Workshop on Safety, Security & Rescue Robotics (SSRR-2014), Toyako-Cho, Japan, 2014
- **M. Coatsworth**, **J. Tran**, A. Ferworn, "A Hybrid Lossless and Lossy Compression Scheme for Streaming RGB-D Data in Real Time", IEEE International Workshop on Safety, Security & Rescue Robotics (SSRR-2014), Toyako-Cho, Japan, 2014
- **C. Kong**, A. Ferworn, **J. Tran**, **S. Herman**, **E. Coleshill** and K. Derpanis, "Toward the Automatic Detection of Access Holes in Disaster Rubble," in IEEE International Workshop on Safety, Security & Rescue Robotics (SSRR-2013), Oct 24-26 2013, Linköping, Sweden, 2013
- A. Ferworn, **S. Herman**, **J. Tran**, **A. Ufkes**, **R. McDonald**, "Disaster scene reconstruction: Modeling and simulating urban building collapse rubble within a game engine", in Summer Computer Simulation Conference, SCSC 2013, Jul 7 – 10 2013, Toronto, On, Canada, 2013
- **J. Tran**, **A. Ufkes**, A. Ferworn, M. Fiala, "3D Disaster Scene Reconstruction Using a Canine-Mounted RGB-D Sensor," in Computer and Robot Vision (CRV), 2013 International Conference on, May 28 – 31 2013, Regina, SK, Canada, 2013
- A. Ferworn, C. Wright, **J. Tran**, C. Li, H. Choset, "Dog and Snake Marsupial Cooperation for Urban Search and Rescue Deployment", in IEEE International Workshop on Safety, Security & Rescue Robotics (SSRR-2012), 5-8 Nov, College Station, Texas, USA, 2012
- A. Ferworn, **J. Tran**, **A. Ufkes**, **S. Herman**, **C. Kong**, "Establishing Network Connectivity under Rubble Using Hybrid Wired and Wireless Approach", in IEEE International Workshop on Safety, Security & Rescue Robotics (SSRR-2012), 5-8 Nov, College Station, Texas, USA, 2012
- **J. Tran**, **A. Ufkes**, M. Fiala, A. Ferworn, "Low-Cost 3D Scene Reconstruction for Response Robots in Real-time," in IEEE International Workshop on Safety, Security & Rescue Robotics (SSRR-2011), Nov 1 - 6 2011, Kyoto, Japan, 2011
- Ferworn, **J. Tran**, **A. Ufkes**, **A. D'Souza**, "Initial Experiments on 3D Modeling of Complex Disaster Environment using Unmanned Arial Vehicle," in IEEE International Workshop on Safety, Security & Rescue Robotics (SSRR-2011), Nov 1 - 6 2011, Kyoto, Japan, 2011
- **S. Sharieh**, K. Sartipi, A. Ferworn, "Light-weight Protocol Simulation for Binary Data Exchange over Heterogeneous Networks", Communications and Networking Simulation Symposium (CNS 2010), April 12-15, 2010, Orlando, Florida, USA.
- **J. Tran**, A. Ferworn, "Bark Indication Detection and Release Algorithm for the Automatic Delivery of Packages by Dogs", 6th International Wireless Communications and Mobile Computing Conference (IWCMC 2010), June 28 – July 2 2010, Caen, France
- **J. Tran**, **M. Gerdzhev**, A. Ferworn, "Continuing Progress in Augmenting Urban Search and Rescue Dogs", 6th International Wireless Communications and Mobile Computing Conference (IWCMC 2010), June 28 – July 2 2010, Caen, France

- **M. Gerdzhev**, **J. Tran**, A. Ferworn, “A Scrubbing Technique for the Automatic Detection of Victims in Urban Search and Rescue Video”, 6th International Wireless Communications and Mobile Computing Conference (IWCMC 2010), June 28 – July 2 2010, Caen, France
- **S. Sharieh,** K. Sartipi, A. Ferworn, “Light-weight Protocol Simulation for Binary Data Exchange over Heterogeneous Networks”, 2010 Spring Simulation Multiconference (SpringSim'10), April 11-15, 2010, Orlando, Florida, USA
- **H. Rahnama**, A. Sadeghian, A. Ferworn and X. Aubry “A Context-Aware Development Framework for Building Self-Adaptive Mobile Software for Public Transport Systems,” in Proc. of the 2009 16th World Congress on Intelligent Transport Systems, Stockholm, Sweden, 25-29 Sept. 2009.
- **C. Ribeiro**, A. Ferworn, **J. Tran** (2009) An Assessment of a Wireless Mesh Network Performance for Urban Search and Rescue Task. IEEE TIC-STH. 369-374.
- **H. Pham**, Q. Mahmoud, and A. Ferworn, “Intelligent agent control using simple logic-based hierarchical planning”, IEEE SMC Fourth International Conference on System of Systems Engineering 2009, May 31-June 3, 2009, Albuquerque, New Mexico, USA.
- I. Woungang, G. Ma, M.K. Denko, A. Sadeghian, S. Misra, A. Ferworn, “Survivability in Existing ATM-Based Mesh Networks”, The IEEE 23rd International Conference on Advanced Information Networking and Applications (AINA’09), May 26-29, 2009, University of Bradford, Bradford, UK
- **C. Ribeiro**, A. Ferworn, M. Denko**, J. Tran**, "Canine Pose Estimation – A Computing for Public Safety Solution”, IEEE CRV 2008, May 25-27, 2009, Kelowna, BC, Canada.
- **S. Bokhari Syed**, A. Ferworn and A. Abhari, “Implementation of Architectural Model for Grid Resources Discovery”, In CNS Session, Proceedings of the 2009 Spring Simulation Multi Conference, March 22 - 27, 2009, San Diego, USA.
- **S. Bokhari Syed**, A. Ferworn and A. Abhari, “Architectural Model for Grid Resources Discovery”, In Poster Track Session Proceedings of the 2008 Spring Simulation Multi Conference, April 14 - 17, 2008, Ottawa, Canada.
- **C. Ribeiro**, A. Ferworn, M. Denko, **J. Tran**, C. Mawson, "Wireless Estimation of Canine Pose for Search and Rescue”, IEEE Systems of Systems Engineering (SoSE'08), June 2-5, 2008, Monterey, CA, USA.
- **J. Tran**, A. Ferworn, **C. Ribeiro**, M. Denko, "Enhancing Canine Search", IEEE Systems of Systems Engineering (SoSE'08), June 2-5, 2008, Monterey, CA, USA.
- **S. Sharieh**, A. Ferworn, O. Pucci, S. Stepanov, V. Toronov, and A. Venetsanopoulos, "Determining cerebral hemodynamic responses to naturally administered cigarette smoke using a fully mobile near-infrared sensor", CAP Congress, Quebec, June 8-11,2008
- **S. Sharieh**, A. Ferworn, V. Toronov, (2008), "A GSM Mobile System to Monitor Brain Function Using a Near-Infrared Light Sensor", In Proceedings of the 21st Canadian Conference on Electrical and Computer Engineering, May 5-7, 2008, Niagara Falls, Ontario, Canada.

- **S. Sharieh**, A. Ferworn, V. Toronov, A. Abhari, "An Ad-hoc Network Based Framework for Monitoring Brain Function", the 11th Communications and Networking Simulation Symposium, Ottawa, Canada, April 14-17 2008, ACM, New York, NY, USA.
- **E. Coleshill**, A. Ferworn, D. Stacey, "Image Enhancement using Frame Extraction Through Time", CISSE 2007, Dec 3-12, 2007, Online.
- I. Woungang, S. Misra, A. Sadeghian and A. Ferworn. "A Minimum Distance Bound on 1-Generator Quasi-Cyclic Codes". Proc. of the 10th Canadian Workshop on Information Theory (CWIT 2007), Edmonton, Alberta, Canada, June 6-8, pp. 156-159, IEEE Catalog # 07EX1602C, ISBN: 1-4244-0769-9, 2007.
- **H. Pham**, Q. Mahmoud, A. Ferworn, A. Sadegian, "Applying Model-Driven Techniques to Pervasive System Engineering", Proc. Of the 29th Intl. Conf. on Software Eng. (ICSE07), May 20-26, 2007, Minneapolis, USA.
- **H. Pham**, A. Ferworn, Q. Mamoud, A. Sadeghian, "Applying Model-Driven Development Techniques to the Development of Search and Rescue Systems", IEEE SoSE 2007, April 16-18, 2007, San Antonio, TX, USA.
- A. Ferworn, A. Sadeghian, K. Barnum, D. Ostrom, H. Rahnama, I. Woungang, "Canine as Robot in Directed Search", IEEE SoSE 2007, April 16-18, 2007, San Antonio, TX, USA.
- A. Ferworn, A. Sadeghian, K. Barnum, D. Ostrom, **H. Rahnama**, I. Woungang, "Rubble Search with Canine Augmentation Technology", IEEE SoSE 2007, April 16-18, 2007, San Antonio, TX, USA.
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- A. Ferworn, G. Hough, R. Manca, "Expedients for Marsupial Operations of USAR Robots", IEEE International Workshop on Safety, Security and Rescue Robotics (SSRR06), Gaithersburg, MD, USA, August 22-24, 2006.
- A. Ferworn, A. Sadeghian, **H. Rahnama**, **H. Pham,** C. Erikson, K. Barnum, D. Ostrom, L. Dell'Agnese, "Urban Search and Rescue with Canine Augmentation Technology", 2006 IEEE International Conference of Systems of Systems (SoSE'06), Los Angeles, USA, Apr 24-26, 2006.
- **A. Arora**, A. Ferworn, "Pocket PC Beacons: WiFi-Based Human Tracking and Following", ACM Symposium on Applied Computing (SAC2005) Special Track on Handheld Computing, Santa Fe, New Mexico, USA, March 13-17, 2005.

- A. Ferworn, **A. Arora**, and M. Jaseemuddin, "IP Mobility Issues for a Mobile Tele-Robotic System – NEPWAK", International Journal of Automation and Computing, Special Issue of Online Robots and E-automation, ISSN1476-8186, pp. 10-16, October 2004.
- **J.E. Coleshill**, A. Ferworn. Spherical Panoramic Video for Micro-Gravity Applications", 55th International Astronautical Congress, Vancouver, Canada, Oct 4-8, 2004.
- A. Ferworn, **W. Lu**, **A. Arora**, **W. Shiu** and D. Ostrom, "Telebotic Control of a Powered-Wheelchair across the WWW – NEPWAK", The 2nd International Conference on Mechatronics and Information Technology, Cheongpung Resort Hotel, Jecheon, Korea, December 4-6, 2003.
- **J.E. Coleshill**, A. Ferworn, "Spherical Panoramic Video – The Space Ball", The 2003 International Conference on Computational Science and its Applications, ICCSA'03, Montreal, Canada, May 18-21, 2003.A. Ferworn, W. Lu, "Optimization For Video and Telebotic Control on Palm OS PDAs", Proc. Of the International Conference on Internet Computing (IC'02), Las Vegas, USA, June 24-27, 2002.
- A. Ferworn, **W. Shiu**, **W. Lu**, "Constrained Image Understanding Using Lossy Compressed Images", Proc. Of the IASTED International Conference for Robotics and Applications (RA'01), Clearwater, Florida USA, November 19-22, 2001.
- A. Ferworn, **J.E. Coleshill**, "Challenges for Mobile Internet Appliances", Proc. Of the IASTED International Conference for Robotics and Applications (RA'01), Clearwater, Florida USA, November 19-22, 2001.
- A. Ferworn, **B.D. Torres**, **S. Patel**, S. Kanellis, "The Internet-Enabled Furnace", Proc. Of the IASTED International Conference for Intelligent Systems and Control (ISC'01), Clearwater, Florida USA, November 19-22, 2001.
- A. Ferworn, **W. Shiu**, K. Plataniotis, "Constrained Image Understanding for an Internet Robot Supporting Telepresence", Proc. Of the 2001 IEEE Canadian Conference on Electrical and Computer Engineering, Toronto, Ontario, Canada, May 13-16 2001.
- A. Ferworn, R.C. Bodner, and M.H. Chignell, "Auditory WWW Search Tools", Proc. Of The Sixth International Conference on Auditory Display, Georgia Institute of Technology, Atlanta, Georgia USA, April 2-5, 2000.
- A. Ferworn, K. Plataniotis, "Effective Teleoperation Over the World Wide Web", Proc. Of the IASTED International Conference for Robotics and Applications (RA'99), Santa Barbara, USA, October 28-30, 1999.
- A. Ferworn, K. Plataniotis, "Solenodon: Unstable Hexapod Walking", Proc. Of the 5th International Conf. on Information Systems Analysis and Synthesis, Orlando, USA, July 31 – August 4, 1999.
- A. Ferworn, **R. Roque**, and **I. Vecchia**, "MAX: Teleoperated Dog on the World Wide Web", Proc. Of the 2nd International Workshop on Presence, The University of Essex, Colchester, U.K., 6-7 April 1999.

- A. Ferworn, **R. Roque**, and **I. Vecchia**, "MAX: Wireless Teleoperation via the World Wide Web", Proc. Of the 1999 IEEE Canadian Conference on Electrical and Computer Engineering, Edmonton, Alberta, Canada, May 9-12 1999. (In Print)
- A. Ferworn, and D.A. Stacey, "The Reflexive Instructor with Deliberate Apprentice Architecture", Proc. Of the 1998 World Automation Congress, Anchorage, Alaska, USA, May 10-14 1998.
- A. Ferworn, and D.A. Stacey, "Inchworm Mobility–Stable, Reliable and Inexpensive", Proceedings of the 3rd IASTED International Conference for Robotics and Manufacturing, June 14-16 1995, Cancun, Mexico.

Magazine Articles

- I. Coe and A. Ferworn, "The Life and Contributions of Countess Ada Lovelace-Unintended Consequences of Exclusion, Prejudice and Stereotyping", IEEE Technology and Society Magazine, Vol. 35, No. 4, December 2016, Pages 46-49

Patents

Inventors: A. Ferworn, K. Barnum and D. Ostrom inventors, Assignee: Ryerson University, "Remote Parcel Deployment System", U.S. Patent # 7,878,154 B2, Feb. 1, 2011.

Conference Activities (Last 3 years)

- Program committee member, the 16th International Conference on Networks, (ICN 2017), April 23-27, 2017, Venice, Italy, http://www.iaria.org/conferences2017/ICN17.html
- Technical program committee member, the 13th International Conference on Mobile Web Information Systems (MobiWIS 2016), 22-24 August 2016, Vienna, Austria, http://www.mobiwis.org/2016/
- Technical program committee member, 12th Conference on Computer and Robot Vision (CRV 2016), Victoria, BC, Canada, June 1-3, 2016, http://www.computerrobotvision.org
- Reviewer, 2015 International Conference on Advanced Mechatronics, Intelligent Manufacture, and Industrial Automation, 15-17 Oct 2015, Surabaya, Indonesia, http://www.ieee.org/conferences_events/conferences/conferencedetails/index.html?Conf_ID=35599
- Reviewer, The Fourteenth International Conference on Networks (ICN 2015), April 19 - 24, 2015, Barcelona, Spain, http://www.iaria.org/conferences2015/ICN15.html
- Program Committee member, the 12th International Conference on Computer and Robot Vision (CRV 2015), Halifax, NS, Canada, June 3-5, 2015, http://www.computerrobotvision.org
- Program Committee member, the 2014 IEEE International Conference on Systems, Man, and Cybernetics (SMC 2014), San Diego, CA, USA, October 5 -8, 2014, http://smc2014.org/

Journal Activities (Last 3 years)

- Editor, "The International Student Journal of Automation Robotics Mechatronics Manufacturing", Ryerson University, http://www.ryerson.ca/sjarmm/
- Editorial board member, "Digital Communications and Networks" Elsevier, https://www.journals.elsevier.com/digital-communications-and-networks/editorial-board
- Editorial board member, "International Journal of Wireless and Mobile Networks", http://airccse.org/journal/j3editorial.html
- Editorial board member, "International Journal of Mechatronics and Automation (IJMA)", http://ijma.ieee-icma.org/Home/Home.aspx
- Editorial board member, "Journal of Robotics and Mechatronic Systems", http://jorams.co.uk/editorial-board
- Editorial board member, "International Journal of Communications and Computer Networks", https://ijcnc.com/editorial/
- Reviewer, IEEE Transactions on Cybernetics
- Reviewer, IEEE Access
- Reviewer, International Journal of Robotics and Automation (ACTA press)
- Reviewer, Applied Mathematical Modelling (Elsevier)
- Reviewer, The International Journal of Computing and Digital Systems (University Of Bahrain)
- Reviewer, International Journal of Humanoid Robotics (World Scientific)
- Reviewer, Applied Mathematical Modelling (Elsevier)
- Reviewer, Journal of Field Robotics (Wiley)
- Reviewer, IEEE Transactions on Cognitive and Developmental Systems

Other matters

Visiting Scholar

Location	Dates	Purpose
Deakin University, Institute for Intelligent Systems Research and Innovation (IISRI), Geelong Campus, Australia	August 2016	Collaboration with Dr. Shady Mohamed and Prof. Saeid Nahavandi—various IISRI current projects.
University of Otago, Department of Information Science, Dunedin, New Zealand	February-March 2011	Collaborate with Dr. Maryam Purvis and Dr. Martin Purvis—robotics at Otago

Other

Multi-Disciplinary Doctoral Studies in Computer Science (MDDS-CS): 2015-Present

As the GPD for CS, in collaboration with the Dean-YSGS, the MDDS-CS is an experiment within Ryerson's Computer Science Doctoral Program. The experiment involves the creation of individual doctoral programs of study designed to address the needs of specific non-Computer Science applicants with strong backgrounds in another discipline. One of the goals of the experiment is to support those who are not seeking a

traditional academic career, but whose lives would benefit from advanced Computer Science Education. Two students are involved in this experiment proceeding through a contractually obligatory qualifying process.

Naïve Caribbean Assistance Plan (NCAP): 2016-Present
In collaboration with Mr. Kevin Junor[12] I created NCAP as an experiment in international education targeting Caribbean residents. The goal of NCAP is to provide long-term, sustainable funding for qualified Caribbean post-secondary applicants to attend transformational educational opportunities at universities. While there appear to be numerous grass roots initiatives in this area, the intent of NCAP is to provide a direct link between potential students, willing universities and programs within them. This embryonic initiative has "naïve" in its name because there does not appear to be other plans it can model itself after. Thus, NCAP is finding its own way. Working with Ryerson International, the plan has the participation of Ryerson's Office of the President who is supporting a social work undergraduate student attending the University of West Indies, Mona, Jamaica campus.

Rubric for Scoring Diversity Working Group: To start August 2017
Working with the Assistant Vice-President/Vice-Provost, Equity, Diversity and Inclusion and her staff, it is our intention to provide clear and actionable guidelines to hiring committees seeking to participate in equitable hiring practices. The working premise is that it should be possible to measure the diversity of any hiring organization at Ryerson and create a rubric that supports its continuing diversification. The initial goal of the EDI team will be to develop equity, diversity and inclusion metrics (score sheets) for the faculty hiring process.

Achievements

- 2017: N-CART visited by Dr. Mark Williamson, Defence Research and Development Canada (DRDC)– Centre for Security Science, Government of Canada
- 2016: Canine Remote Deployment System (developed and patented in NCART lab) deployed for disaster relief in Lebanon by Utah-based NGO "Field Innovation Team" (FIT)
- 2016: Research collaboration with FIT added to "speaking points" of Consul General of Canada in international trade discussion with the Governor of Utah.
- 2015: Invited presenter to the Colorado Innovation Network (COIN) Summit sponsored by the State of Colorado, Office of the Governor
- 2014: Named Partner In Research (PIR) national "Technology Ambassador". The Technology Ambassador Award of PIR recognizes outstanding contributions of a

[12] Kevin Junor, Deputy Superintendent, Government of Ontario, Senior Program Advisor-Use of Force, Ontario Ministry of Public Safety and Correctional Services, Chairman, Provincial Alliance Credit Union, Former Regimental Sergeant Major, Canadian Armed Forces.

body of work over a period of time to the field of technology and to Canadians and their promotion to the public by a Canadian researcher.

- 2014: Named Privacy by Design Ambassador by the Information Privacy Commissioner of Ontario.
- 2013: Invited TEDx talk at TEDx@RyersonU: "Dogs and Robots"
- 2013:EURAXESS "Science Slam" Canadian champion, ranked 2nd in North America[13].
- 2012: Research recognized by IEEE Spectrum, viewed by over 300000 Scientists and Engineers[14].
- 2011: National Institute of Standards and Technology award for contributions to the Response Robot Evaluation Exercise process. College Station, TX, USA.
- 2009: Nominated as "best lecturer" for TVO's program "Big Ideas" competition.
- 2009: Awarded "Information Technology Hero" by the Information Technology Association of Canada (ITAC) for work research work in Urban Search and Rescue.
- 2007: Winner of the Ontario Government Showcase of Excellence awards (Gold and Diamond awards) for project achievement for the research project "Canine Augmentation Technology".
- 2001-05: Recognized as one of the "Popular Profs" at Ryerson University by Maclean's Magazine Guide to Canadian Universities.
- 1995: Received University of Waterloo Graduate Fellowship
- 1994: Recipient of the Maple Leaf Chapter of the Association of Old Crows
- 1994: Recipient of the University of Waterloo graduate scholarship.
- 1992: Awarded the Canadian Forces Decoration for twelve years of service in the Canadian Armed Forces.
- 1992: University of Guelph Graduate Fellowship for academic achievement.
- 1988: Royal Regiment of Canada Association scholarships while attending Ryerson.

Memberships and Professional Affiliations

- Member of the Institute of Electrical and Electronic Engineers (IEEE).
- Member of the Association of Computing Machinery (ACM)
- Member of the Business Technology Management (BTM) Governing Council of the Information Technology Association of Canada (ITAC)
- Member of the Royal Regiment of Canada Association
- Member of the advisory committee of the U.S. National Institute of Standards and Technology (NIST) reporting to the Department of Homeland Security (DHS) for the standardization of performance metrics for Search and Rescue (response) Robots (Through the ASTM standards organization committees E54: "Homeland Security Technology" and E54.09: "Response Robots")

[13] http://www.ryerson.ca/science/research/stories/news_ScienceSlam_update.html
[14] http://spectrum.ieee.org/automaton/robotics/industrial-robots/search-and-rescue-dog-deploys-robot-snake-via-bark-control

- Member of Ryerson's Yeates School of Graduate Studies Council.
- Member of Ryerson's Yeates School of Graduate Studies Programs and Planning Committee
- Member of the G. Raymond Chang School of Continuing Education Council
- Member at Large of Ryerson's Senate
- Member of Ryerson's Senate Priorities Committee
- Past member of the advisory council of the Department of Computer Science at the University of Ontario Institute of Technology.

References:

Available on request.