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Education:

1998: Doctor of Philosophy, System Design Engineering, University of Waterloo.
Autonomy and autonomous agents/robots.

1992: Master of Science, Computing and Information Science, University of Guelph.
Artificial Neural Networks and their application to the automatic conversion of text into speech sounds. Additional work was conducted in the field of human factors in computing.

1988: Bachelor of Technology, Applied Computer Science, Ryerson Polytechnic Institute.

Academic Experience: Current

January 2013- Present,
Director-Professional Graduate Diploma Programs (D-PGDP),
Yeates School of Graduate Studies (YSGS),
Office of the Dean

Reporting to the Dean-YSGS, the D-PGDP is responsible for the definition, creation and launch of cost-recovery, graduate programs leading to Ryerson's newest credential, the Professional Masters Diploma (PDip). I have been responsible for managing the academic approval (at every level, including Ryerson's Senate) of six PDips since January 2012, across 4 Departments in 3 Faculties. There are currently another 3 PDips awaiting transmission to Ontario's Quality Council and about half a dozen proposals at some level of internal approval.

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 (Chang School).

January 2011- Present

Faculty Liaison,

Faculty of Engineering and Architectural Science (FEAS), Faculty of Science (FoS) to the Chang School,

Office of the Deans

Reporting to the Deans of FoS, FEAS and the Chang School, the Liaison forms the nexus between the goals of 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, proposing and fostering the creation of new certificate programs, workshops and course series (undergraduate and non-graduate) related to curriculum, interests and competencies from the 2 academic Faculties to CSCE. This role includes developing delivery and governance models. To date, I have substantively contributed to (written, revised or collaboratively created) the list of programs/course series/workshops listed below:

1. Data Analytics, Big Data and Predictive Analytics¹ (Certificate, FEAS)
2. Computer Security and Digital Forensics (Certificate, FoS)
3. Disaster and Emergency Management (Certificate, FoS)²
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)³
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 Engineering Design (FEAS)
17. Non-Technical Workshops for Technologists and Technicians in the Technical Sector (FEAS)

July 2007- Present,

Graduate Program Director (GPD),

Associate Chair,

Department of Computer Science

¹ I shares the co-academic coordinator role in this program with Prof. Ayse Bener (Mechanical and Industrial Engineering).

² This is the only D&EM program housed within a Department of Computer Science in the World.

³ This Certificate program is a collaboration across 2 Faculties (FEAS and FoS) and 3 Departments (CS, Mech/Ind Eng and E&CE)

The GPD is responsible for all aspects of the Masters and Doctoral Programs in Computer Science. I am the founding GPD and author of all Letters of intent (LoI), briefs, rebuttals and responses to internal and external reviewing and authorizing bodies for both programs. The programs were authorized to run by the Province in 2007 and 2011 for the MSc and PhD programs respectively. I am the author of the brief that substantially revised the MSc program (2015) that has (roughly) doubled applicant demand for the spaces in the program.

While I am the founding GPD for Computer Science, I am also Ryerson's longest serving GPD.

**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 an instructor at Ryerson I am responsible for presenting 1 or 2 undergraduate courses in Computer Science 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 and Methods of Instruction.

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 Police⁴ (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, various Provost working groups and I am one of the longest-serving, elected Senators at Ryerson. I have been an avid supporter of the Science Rendezvous community outreach event (from its inception at Ryerson)--organizing many students volunteers and demonstrations and support several robotics/technology-related clubs in High Schools and one Middle School in the Greater Toronto Area.

**September 2000- Present
Adjunct Professor
School of Computer Science
The University of Guelph**

⁴ 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.

I collaborate with regular faculty members within the school, co-supervise Masters and Doctoral students.

November 2012 – Present

Adjunct Professor

Department of Computing and Software

McMaster University

I collaborate with regular faculty members within the school, co-supervise Masters and Doctoral students.

Academic Experience: Past

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.

February 1996 - August 1996, Technology Team Leader,

The Eaton School of Retailing,

Ryerson Continuing Education and Bell Canada

The Eaton School of Retailing was a corporate entity within, what was, the T. Eaton Company Ltd. It was established to manage the delivery of corporate education in the Eaton's chain of department stores. In partnership with Ryerson, the school sought to develop and deliver University-level programming to its students. As a team leader, I oversaw and coordinated the selection of technology for Ryerson's distance education offering for the school. The focus was to use enhanced multimedia tools, including video conferencing, to present course material in a cost-effective manner.

May-August 1995, Lecturer,

Department of Computing and Information Science,

The University of Guelph.

In conjunction with Dr. Deborah A. Stacey, I presented a graduate course involving intelligent systems and mobile robotics. The goal of the course was to have students actually build robots, which could interact with a specified world in intelligent ways. This goal was achieved and culminated in a final competition, which was attended by various representatives from Industry and Education.

Research Interests

- Robotics (ground 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 and CBRNe)
- Canine olfaction, behavior and augmentation

Research Experience

September 1996 - Present

Director of Research

The Network-Centric Applied Research Team (N-CART)

School of Computer Science

Ryerson University

As the research director I coordinate the efforts of several faculty members and provide direction to a mixed team of a dozen doctoral and masters students and several post docs who perform applied research in the area of computational public safety—mostly related to USAR and the structural collapse of occupied buildings. 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 NCART was recognized by the Ontario Government by 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. I maintain contact with the group as a Adjunct Professor within the Department of Computing and Information Science at the University of Guelph.

September 1993 - October 1997,

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.

Professional Experience:**Full time:****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 IVR strategies through the use of an intelligent embedded-computing 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 was 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. This assignment was interrupted by an emergency work assignment during a strike within Bell Canada. I became responsible for the installation and repair of telecommunications services to Bell Canada's residential and single-line business customers.

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 deployment⁵.

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 progressed through the ranks, I held virtually every appointment within an infantry Company--retiring with the rank of Captain and the appointment of Company Commander-Combat Service Support Company. During my career I took many courses on leadership and instructional technique and have been given 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 and leadership of over 120 personnel under operational conditions. I received the Canadian Forces Decoration (CD) in 1992.

Consulting Positions**October 2004 – Present****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 within a company 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 member of my lab 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

⁵ The deployment was scrubbed shortly thereafter.

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 that is being used as the basis for similar projects.

May 2000 - January 2001

Moby Dark Inc.

I, and my 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 initially 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 contracted 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.

September 1997 - March 1998

Personal Digital Assistant Research Group

Apple Canada

My research team was contracted to examine the interface to Apple's Newton Personal Digital Assistant. We focused on issues related to network connectivity and usability. We presented our work to the president of Apple Canada at the end of the contract.

Publications

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

- **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

- **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 Aerial 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.
 - A. Ferworn, **N. Tran**, **J. Tran**, G. Zarnett, F. Sharifi, "WiFi repeater deployment for improved communication in confined-space urban disaster search", IEEE SoSE 2007, April 16-18, 2007, San Antonio, TX, USA.
 - A. Ferworn, **N. Tran**, **J. Tran**, G. Zarnett, F. Sharifi, **J.E. Coleshill**, A. Ferworn, D. Stacey, "Obstruction Removal using Feature Extraction Through Time for Video Conferencing Processing", CISSE 2006, Dec 4-14, 2006, Online.
 - **J.E. Coleshill**, A. Ferworn, D. Stacey, "Traffic Safety using Frame Extraction Through Time", SoSE 2007, April 16-18, 2007, San Antonio, TX, USA.
 - **J.E. Coleshill**, A. Ferworn, D. Stacey, "Feature Extraction Through Time", 57th International Astronautical Congress, IAC-06-B4.4.03, Valencia Spain, Oct 2-6, 2006.
 - 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, “Telebot 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.
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- 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.

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.

Graduate Student Supervision

Name	University	Department	Program	Start	End
Shiu, Wing	Guelph	Comp. and Info Sci.	MSc	2001	2003
Coleshill, Elliott	Guelph	Comp. and Info Sci.	MSc	2001	2003
Klotz, Greg	Guelph	Comp. and Info Sci.	MSc	2002	2004
Pham, Justin	Guelph	Comp. and Info Sci.	MSc	2003	2005
Lu, Wei	Guelph	Comp. and Info Sci.	MSc	2001	2003
Nguyen, Le	Guelph	Comp. and Info Sci.	MSc	2003	2005
Lac, Hao	Guelph	Comp. and Info Sci.	MSc	2002	2004
Arora, Ankit	Ryerson	E&CE	MSc	2003	2005
Tran, Jimmy	Ryerson	Comp. Sci.	MSc	2007	2009
Tran, Nhan	Ryerson	Comp. Sci.	MSc	2009	2011
Sommers, Vijay	Ryerson	Comp. Sci.	MSc	2007	2009
Ribeiro, Cristina	Guelph	Comp. and Info Sci.	MSc	2006	2008
Coleshill, Elliott	Guelph	Comp. and Info Sci.	PhD	2004	2010
Rahnama, Hossein	Ryerson	E&CE	PhD	2006	2010
Somers, Vijay	Ryerson	E&CE	MSc	2007	2009
Bokhari, Saadat	Ryerson	Comp. Sci.	MSc	2007	2009
Sharieh, Salah	Ryerson	Comp. Sci.	MSc	2007	2008
Gerdzhev, Martin	Ryerson	E&CE	MSc	2008	2010
Tran, Jimmy	Ryerson	Comp. Sci.	PhD	2009	TBD
D’Souza, Andrew	Ryerson	Comp. Sci.	MSc	2009	2011
Shah, Waqas	Ryerson	Comp. Sci.	MSc	2010	2012
Ufkes, Alex	Ryerson	Comp. Sci.	MSc	2010	2013
Herman, Scott	Ryerson	Comp. Sci.	MSc	2011	2013
Kong, Christopher	Ryerson	Comp. Sci.	MSc	2012	2014
Chan, Christopher	Ryerson	Comp. Sci.	MSc	2013	2015
Ufkes, Alex	Ryerson	Comp. Sci.	PhD	2013	TBD
Zouri, Muthana	Ryerson	Comp. Sci.	PhD	2013	TBD
Waismark, Ben	Ryerson	Comp. Sci.	MSc	2014	TBD
Bains, Gurjit	Ryerson	TRSM	MBA	2014	2014
Chan, Christopher	Ryerson	Comp. Sci.	PhD	2015	TBD
Djafarova, Naza	Ryerson	Comp. Sci.	PhD	2015	TBD
Tran, Nhan	Ryerson	Comp. Sci.	PhD	2015	TBD
Blain, Rob	Ryerson	Master of Digital Media	MDM	2015	TBD
Brennan, Lindsay	Ryerson	Master of Digital Media	MDM	2015	TBD

Research Grants

Granting Agency	Start	Duration	Amount	Topic
Ryerson Starter Grant	1996	1 yr	\$5000	Personal Digital Assistants
Bell Sygma Inc.	1996	1 yr	\$1000	Personal Digital Assistants
Apple Canada	1996	1 yr	\$4500	Apple Newton PDA Study
Bell Sygma Inc.	1996	-	\$23000 (in-kind)	Equipment Grant
Bell Canada	1996	2 yr	\$1000 (in-kind)	Telephone Line
Active Surplus Annex	1997	1 yr	\$500 (in-kind)	Sumo Robot Design in collaboration with Ontario College of Art and Design artist Norman White
NSERC (Discovery)	1998	2 yr	\$18000	Autonomous Systems
Bell Global Solutions	1998	2 mths	\$6000	Competition Study – Fax services
Department of Foreign Affairs and International Trade	1999	4 days	\$10000	Sponsored “Team Canada” participant on research mission to Japan to demonstrate the Internet robot project: MAX ⁶
NSERC (Discovery)	2000	4 yr	\$48000	Distributed Network Services for Remote and Teleoperated Systems
Moby Dark Inc.	2000	4 mths	\$2000	Collaborative Research Grant – Network-centricity
HumCorp Networks Inc.	2002	1 yr	\$2000 (in-kind)	Network Routing Research
Microsoft Canada	2003	Indefinite	\$25K (USD)	Network-Enabled Powered Wheel-Chair Adaptor Kit Prototype
Invacare	2003	2 yr	\$15000 (in-kind)	Network-Enabled Powered Wheel-Chair Adaptor Kit Prototype (3 Powered Wheelchairs donated)
Dog-Goes	2005	1 yr	\$2000 (in-kind)	Canine USAR
Ontario Provincial Police	2005	Ongoing	\$20K/yr (in-kind)	Canine Augmentation Technology/ Improved Urban Search and Rescue Robotics/ improve CBRNe response robots
NSERC (EQPEQ program)	2007	1 yr	\$44338	Vision-based micro-manipulation system for autonomous inspection

⁶ 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.

				and assembly of micro-parts
OPIC	2007	1	\$10000	CAT Demonstration Project at HUSAR exercise with OPP/PERT
OPIC	2008	3	\$25000	Canine Remote Deployment System Market Readiness
Ontario Centres of Excellence (Communication and Information Technology)	2008	6 mths	\$13703	Algorithm for the Automatic Placement of Nodes to extend emergency wireless networks.
Ontario Centres of Excellence (Photonics)	2008	6 mths	\$15000	Untethered near-infrared brain spectroscopy to monitor canine brain function.
NSERC (Discovery)	2010	5 yrs	\$31000/yr	Human Interface for Canine Augmentation Technology Data
NSERC (Engage)	2010	6 mths	\$25000	Dual Function Pressure Pipe Inspection Sensor Head—With Pressure Pipe Inspection Company
NSERC (Engage)	2010	6 mths	\$25K	An Algorithm for Determining Acceptable Personal Space—With InteraXon Inc.
NSERC (Engage)	2013	6 mths	\$25K	Sensor mount for UAV for scanning urban disaster scenes. With the AeroX company.
NSERC (Engage)	2014	6 mths	\$25K	Confined Space Flight Software Assist with DreamQii Inc.
Microsoft Canada	2014	Indefinite	\$25K (USD)	Embedded Systems Grant
NSERC (CREATE)	2015	6 yrs	\$1.65M ⁷	ADERSIM Project
NSERC (Engage)	2015	6 mths	\$25K	Omni-directional canine camera system
G. Raymond Chang Family	2016	indefinite	\$25K	Canine applications for Computational Public Safety
NSERC (Engage)	2016	6 mths	\$25K	Cloud-based monitoring of manufacturing equipment using Internet of Things (IOT) technology

Personal Achievements:

- 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.

⁷ I am one of 11 principle investigators. To date, this opportunity has provided training for 1 MSc and 1 PhD student and funded an initial investigation in the gamification of certain explosive neutralization tasks.

- 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 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 America⁸.
- 2012: Research recognized by IEEE Spectrum, viewed by over 300000 Scientists and Engineers⁹.
- 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 Force.
- 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)
- Reviewer for the Ontario Graduate Scholarship program, have reviewed and refereed grants for various granting agencies including NSERC, OPIC and the OCE.
- Member of the Royal Regiment of Canada Association

⁸ http://www.ryerson.ca/science/research/stories/news_ScienceSlam_update.html

⁹ <http://spectrum.ieee.org/automaton/robotics/industrial-robots/search-and-rescue-dog-deploys-robot-snake-via-bark-control>

- Refereed many conferences and journals--generally related to wired and wireless networking and robotics.
- 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 on the Homeland Security Technology Committee E.54).
- Member of the graduate programs of the School of Fashion, the Department of Physics and the Department of Electrical and Computer Engineering at Ryerson.
- 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 of Ryerson's Senate.
- Past member of the advisory council of the Department of Computer Science at the University of Ontario Institute of Technology.

References:

Available on request.