Howard Li

1 Biographical

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Date of CV:	March 6, 2018
Signature:	

2 Summary

2.1 Record of Pursuit of Advanced Degrees and/or Further Academic Study

2006	PhD	Doctor of Philosophy in Electrical and Computer Engineering University of Waterloo, Waterloo, Ontario, Canada Thesis: A Framework for Coordinated Control of Multi-Agent Systems Supervisors: Dr. Fakhri Karray and Dr. Otman Basir
2006		Certificate in University Teaching University of Waterloo, Waterloo, Ontario, Canada
2005		Team Based Project Management School of Business, Queen's University, Kingston, Ontario, Canada
2002	MSc	Master of Science in Engineering System and Computing University of Guelph, Guelph, Ontario, Canada Thesis: The Development of a Biologically Inspired Mobile Robot with a Visual Landmark Recognition System Supervisor: Dr. Simon Yang
1999		Diploma of Arts in English Language Foreign Affairs University, Beijing, China
1995	BEng	Bachelor of Engineering in Electrical Engineering Zhejiang University, Hangzhou, China Thesis: Computer-Based Hand Written Word Recognition - Pattern Analysis and Machine Intelligence

2.2 Teaching Subjects

- Without Preparation
  - Systems & Control Theory
  - Industrial Control
  - Intelligent Control
  - Linear/Nonlinear Control Systems
  - Stochastic Control
  - State Estimation

  - Discrete Time Control Systems
  - Mechatronics
  - Embedded Systems
  - Introduction to Robotics
  - Artificial Intelligence
  - Scientific Instrumentation
  - C++ Programming
  - Digital/Analog Electronics
  - Engineering Design
  - Engineering Drafting

- With Some Preparation
  - Electrical and Electronic Fundamentals
  - Power Electronics
  - Electrical Power Systems
  - Microcontrollers
  - Information Theory

2.3 Research Interests

I have a special interest in mechatronics, embedded systems, and intelligent control systems that involve sensors & actuators, system modeling, locomotion as well as parameter and state estimation. In order to conduct high quality research and provide training to HQP, I have established the following unique research infrastructure:

- Multiple Unmanned Ground Vehicles: four mobile robots and one autonomous all terrain ground vehicle equipped with laser sensors, encoders, Inertial Measurement Units (IMU), GPS, video cameras, and infrared sensors
- Multiple Unmanned Aerial Vehicles: Draganflyer X8 Rotorcraft, TREX 450 RC helicopters, quad rotor helicopters, fixed-wing aircraft (FOX, EZ Hawk), targeting systems (daylight and thermal cameras), autopilot (IMU, GPS, differential pressure sensor, absolute pressure sensor, voltage sensor, current sensor, range sensor for indoor localization), STANAG (NATO abbreviation for Standardization Agreement) 4586 Standard Interface of the Unmanned Control System (UCS), flight simulators, communication systems (COMM), antenna tracker, Attitude Heading Reference Systems (AHRS), Inertial Navigation Systems (INS) (Fig. 1 Fig. 2)
- Autonomous Underwater Vehicles: motion planner, simulator, 3D visualizer, base station, navigation systems, and automatic control systems

My main research areas include:

- Robotics
  - Motion planning and control of robotic systems
  - Simultaneous Localization And Mapping (SLAM)

Figure 1: The unmanned aerial vehicle

  - Mobile robots and robot manipulators
  - Behavior based robotics
  - Multi-sensor fusion and its applications in robotics and control systems
  - Machine vision

- Unmanned Vehicles
  - Unmanned Aerial Vehicles (UAVs)
  - Unmanned Ground Vehicles (UGVs)
  - Autonomous Underwater Vehicles (AUVs)

- Mechatronics
  - Sensors (infrared sensors, laser sensors, light sensors, sonar sensors, bumpers, IMU, GPS, hall effect sensors, tilt sensors, thermo-couples, etc.)
  - Actuators (DC motors, servo motors, solenoid valves, hydraulic cylinders and pneumatic cylinders)
  - Electrical systems
  - Microcontrollers and microprocessors
  - Industrial systems with data acquisition systems, PLC and HMI

- Control Systems
  - Linear control systems
  - Nonlinear control systems
  - Stochastic control
  - Estimation theory
  - Discrete time control systems
  - Multi-variable control systems
  - Intelligent control systems
  - Embedded systems

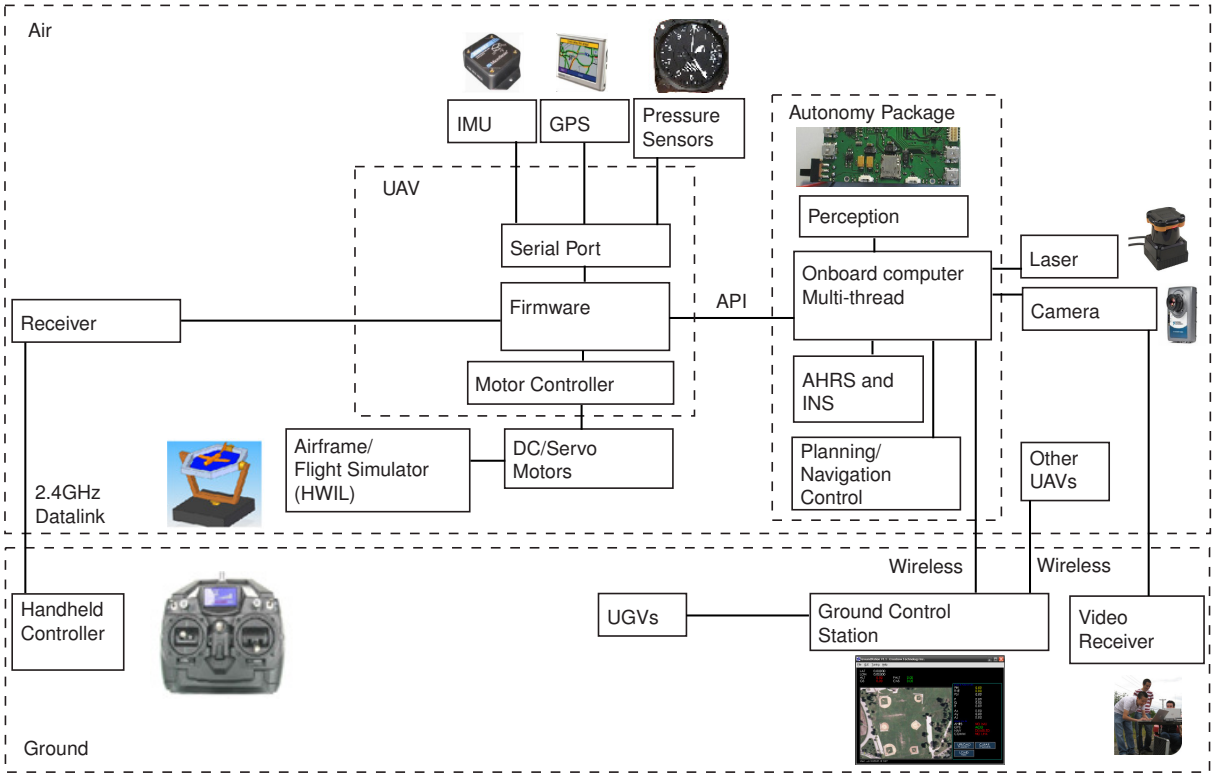

Figure 2: System architecture of the UAV

  - Real-time systems

- Artificial Intelligence
  - Neural networks, fuzzy logic and genetic algorithms
  - Reinforcement learning
  - Information theory, pattern analysis and recognition

- Multi-Agent Systems
  - Control of multi-agent systems
  - Coordination and cooperation of multiple autonomous vehicles
  - Control of multi-robot systems
  - Reconfigurable systems
  - Distributed control systems

In order to conduct the above research, I have established collaborations with L3 Wescam, Honeywell, Ontario Power Generation, iRobot, Clearpath Robotics, Department of National Defence, Defence R&D Canada Atlantic, Defence R&D Canada Suffield, Defence R&D Canada Valcartier, Naval Surface Warfare Center, University of Guelph, University of Waterloo, Dalhousie University, McGill University, Massachusetts Institute of Technology, University of Toronto Institute of Aerospace Studies, and University of New South Wales, etc.

3 Employment

3.1 Research Experience

2015 – Professor, **University of New Brunswick**, Fredericton, NB, Canada
2010 – 2015 Associate Professor, **University of New Brunswick**, Fredericton, NB, Canada
2007 – 2010 Assistant Professor, **University of New Brunswick**, Fredericton, NB, Canada

- Conducted research on Intelligent Coordination of Multiple Unmanned Ground Vehicles and Unmanned Aerial Vehicles (collaborated with Defence R&D Canada Suffield of the Department of National Defence)
- Developed a Multi-Agent System for Countering Underwater Threats (collaborated with Defence R&D Canada Atlantic and Defence R&D Canada CORA of the Department of National Defence)
- Conducted research on Coverage Mission Planner for Mine Countermeasure (collaborated with Defence R&D Canada Atlantic of the Department of National Defence)
- Conducted research on Integration of Sensor Systems into Perpetual Systems for Use on Novel Small Scale Vehicle Platforms (collaborated with Defence R&D Canada Suffield of the Department of National Defence and Shore Consulting Group)
- Conducted research on Remote Inspection of Nuclear Power Plants Using Mobile Robots
- Other projects: Aggregated Load Control Using Electric Domestic Water Heaters and Smart Meters (collaborated with Professor Liuchen Chang, Professor Julian Meng, Saint John Energy and New Brunswick System Operator); intelligent transportation systems as a collaborator (collaborated with Professor Ming Zhong); intelligent wheelchairs as a collaborator (collaborated with Professor Peter Kyberd and Stan Cassidy Rehabilitation Center)
- Collaborated with industry partners, universities and government agencies
  - Defence Research and Development Canada - Atlantic, Dartmouth, Nova Scotia, Canada, Department of National Defence (also helped the following colleagues to establish new connections with DRDC Atlantic: Drs. Andrew Gerber, Don Kim, and Gordon Holloway)
  - Defence Research and Development Canada - Suffield, Suffield, Alberta, Canada, Department of National Defence
  - Defence Research and Development Canada - Valcartier, Valcartier, Quebec, Canada, Department of National Defence
  - Defence Research and Development Canada - CORA, Ottawa, Ontario, Canada, Department of National Defence
  - National Institute of Standards and Technology, Maryland, USA
  - Underwriter's Laboratory Canada, Toronto, Ontario, Canada
  - China Household Electrical Appliance Research Institute, Beijing, China
  - Agency of Defence Development, South Korea
  - New Brunswick Association of Defence and Aerospace, Fredericton, NB
  - L-3 Wescam, Burlington, ON

  - Honeywell, Mississauga, ON
  - ING Engineering, Fredericton, NB
  - RobotShop, Montreal, QC
  - Ontario Power Generation, Ajax, ON (helped my colleagues to develop the new research programs: Drs. Maryhelen Stevenson, Eduardo Castillo Guerra, Joseph Hall, and Gordon Holloway)
  - Case Bank Technologies, Mississauga, ON
  - Atlantic Mini Fridge, Moncton, NB
  - Atlantic Nuclear Services Ltd., Fredericton, NB
  - BeneFACT Consulting Group, Toronto, ON
  - Shore Consulting Group, Toronto, ON
  - Quanser Consulting Inc., Markham, ON
  - SkyMetro, Moncton, NB
  - CDL Systems, Calgary, AB
  - Neptec Design Group Ltd., Kanata, ON
  - CM-Labs Inc., Montreal, QC
  - Xiphos, Montreal, QC
  - Clearpath Robotics, Waterloo, ON
  - MC Border Security, Fredericton, NB
  - Moncton Flight College, Moncton, NB
  - Fredericton International Airport, Fredericton, NB
  - Forest Protection Ltd., Fredericton, NB
  - Thales Canada, Ottawa, ON
  - McGill University
  - University of Toronto, Institute of Aerospace Studies
  - Massachusetts Institute of Technology
  - University of New South Wales
  - University of Waterloo
  - University of Guelph
  - Dalhousie University
  - Peking University
  - Tsinghua University
  - Beijing University of Aeronautics & Astronautics
  - Beijing Jiaotong University
  - Federal University of Rio Grande do Sul, Brazil
- Supervised graduate students and undergraduate students
- Miscellaneous
  - Established the Collaboration Based Robotics and Automation (COBRA) Group which is well recognized in the unmanned systems society by researchers in academia, industry and government (http://www.unb.ca/cobra)
  - Developed Lab Safe Operating Procedures for the COBRA research group
  - Presented research results to collaborators such as, Aeryon Labs, Clearpath Robotics, Bombardier, Lockheed Martin, MDA Corporation

- Presented at the Electrical and Computer Engineering Department Research Expo
- Organized the National Instruments workshop for the Electrical and Computer Engineering department
- Organized tours of collaborating universities for UNB colleagues (Dr. Eduardo Castillo Guerra and Dr. Maryhelen Stevenson)
- Prepared department tours/demonstrations for UNB alumni
- Participated in the department tours/demonstrations for UNB Open House
- Prepared/submitted course information for undergraduate courses to be accredited by Canadian Engineering Accreditation Board (CEAB)
- Provided services to the department project - Powershift Atlantic

2015 Visiting Professor, **Ecole Polytechnique Federale de Lausanne (EPFL)**, Lausanne, Switzerland

- Worked on navigation and adaptive sampling using swimming robots, with applications to pollution detection in aquatic environments

2014 Visiting Professor, **Universita di Pavia**, Pavia, Italy

- Worked on particle filter based localization using RSSI signals

2013 – 2016 Visiting Professor, **Beijing Jiaotong University**, Beijing, China

2002 – 2006 Research Assistant, **University of Waterloo**, Waterloo, Ontario, Canada

- Developed a multi-agent cooperative robotic system (a mobile robot, a robot manipulator and an overhead crane)
- Implemented the vision navigation system for an iRobot mobile robot (CCD camera, DC motors, encoders, sonar sensors, servo motors, Linux and C++)
- Designed an intelligent parallel parking system (Altera FPGA, servo motors, AD converters, etc.)
- Worked on the hardware (DC motors, encoders, laser range finders, motor controllers, micro-controllers and MultiQ boards) and software (Microsoft Visual C++ and Java) of two industrial overhead cranes
- Programmed a fuzzy anti-swing controller (C++) for the overhead cranes

2000 – 2002 Research Assistant, **University of Guelph**, Guelph, Ontario, Canada

- Built an autonomous mobile robot using Motorola 68HC11 (Handybord designed by MIT)
- Modeled, analyzed and tuned automatic control systems and robots (Matlab/Simulink)
- Implemented mechatronic systems with sensors (infrared sensors, hall-effectors, encoders, photocells, bumpers, magnetometers and potentiometers) and actuators (DC motors and servo motors)
- Developed a visual image processing system for pattern recognition (C++ and Matlab)
- Developed Internet-based remote control systems using Java (solenoid valves, a digital balance with the RS232 port and I/O boards)

3.2 Industry and Consulting Experience

2005 – 2007 Simulation Engineer, **Atlantis Systems International**, Brampton, Ontario, Canada

- Upgraded the Integrated Maintenance Training System for F/A-18 Hornet (multi-mission fighter/attack aircraft) for Boeing, Canadian Air Force and Royal Australian Air Force
  - Worked on the Mission Computer (AN/AYK 14 Navy Standard Airborne Computer, Assembly, and C++) of the F/A-18 Hornet
  - Worked on the Multi-Purpose Display Group
  - Worked on the AN/ALE-47 Countermeasures Dispenser System and the Electronic Warfare System
  - Worked on the Multifunctional Information Distribution System (MIDS) - includes TACAN and Data Link communication and targeting systems
  - Worked on the Left/Right DDIs, the Horizontal Signal Indicator and the Situation Awareness (SA)
  - Worked on the upfront control system
  - Worked on the hydraulic system, the landing gear/emergency brake system, and the Auxiliary Power Unit (APU)
  - Worked on the Memory Unit (MU)
  - Worked on the RADAR format and waypoints
  - Worked on the Head-Up Display (HUD)
  - Worked on the warranty tasks
- Upgraded the EH-101 helicopter simulator for Royal Danish Air Force
  - Worked on the Internal Functional Design Review, Internal Preliminary Design Review, Internal Critical Design Review, coding, unit tests, debugging, Acceptance Test Procedure (ATP) for NAV, MNT, PERF, and MDD, and close-out reports
  - Worked on the monitoring I/O system that includes the following modules: Sensors interface Unit Interface (PSI); Validation, Selection and Averaging (VSA); Status Monitoring Display (PSM); Electrical Plant Alarm Detection (EPA); Hydraulic Plant Alarm Detection (HPA); Transmission and Rotor Plant Alarm Detection (TPA); Fuel Plant Alarm Detection (FPA); Engine Plant Alarm Detection (ENA); Anti Ice Plant Alarm Detection (AIA); Miscellanea Plant Alarm Detection (MXA); APU Plant Alarm Detection (APU); Commands Management (CMD); Alarm Filtering (ARF); Torque Available Management (TAM); Avionic System Status Monitoring (AVM); Sensors Excitation Management (SEM); Alarm Management (ALM); Built in Test (BIT); Redundancy Management (RM); Calendar Clock Management (CCM); malfunctions
  - Worked on the navigation I/O system
  - Worked on the steering I/O system: IDS, IDU
  - Worked on the MDD (Maintenance Data Download) system
  - Worked on the DTR (Data Transfer and Redundancy): access database, DAO recordset (read/write)
- Mentored new hires and provided customer support to Boeing and Canadian Forces
- Attended the American Institute of Aeronautics and Astronautics Conference

- Maintained Microsoft Visual Studio, Microsoft Visual Studio Team Systems, C++/C and Access database for the projects
- Founded a corporate Toastmasters Club (proposal writing, meeting arrangement, discussion with the CEO and the HR, recruitment of new members, demo meeting, etc.)
- Arranged a tour of the University of Waterloo and local companies for corporate officials
- Wrote articles for the corporate newsletter - E-dart
- Served on the corporate social club committee
- Organized a corporate wine tour in Niagara-on-the-Lake, Ontario
- Organized the corporate bicycle team for Becel Heart & Stroke Ride for Heart, Toronto, Ontario
- Worked on corporate strategic plans
- Worked on risk management and classification for project proposals

2004 – 2004 Consultant, **Alt Software, Inc.**, Waterloo, Ontario, Canada

- Programmed the device driver for ATI Radeon graphics cards (C++ and OpenGL), Advanced Micro Devices

2004 – 2004 Consultant, **Christie Digital Systems, Inc.**, Kitchener, Ontario, Canada

- Designed user interfaces for MediaMASTER4.0 for digital projectors using Microsoft Visual C++, Microsoft Access and SQL
- Developed the device driver for matrix switchers (RS232)

2001 – 2001 Student Engineer, **Applied AI Systems, Inc.**, Kanata, Ontario, Canada

- Built an autonomous ground vehicle
- Demonstrated robotic projects at the Canadian embassy in Tokyo, Japan
- Designed the schematic and PCB for microcontrollers (Microchip PIC) using Accel
- Programmed Microchip PIC using the assembly language

2000 – 2001 Research Assistant, **Agriculture and Agri-Food Canada**, Guelph, Ontario, Canada

- Built and programmed models for food engineering processes using artificial neural networks
- Analyzed the mathematical model for physical processes

1995 – 2000 Electrical Engineer, **National Household Electric Appliance Quality Supervision and Test Center**, Beijing, China

- Developed a thermostat testing device, and programmed the control software and GUI using Visual Basic, Microsoft Access and SQL
- Built a refrigerator testing device as a major designer in a team (DC motors, heaters, compressors, PLC, data acquisition systems, Microsoft Visual Basic, C++, etc.)
- Designed a compressor abnormal performance testing device (thermocouples, DC motors, PLC and Microsoft Visual Basic)

- Programmed a test and measurement software package for the ETL air-conditioner testing equipment (C++)
- Inspected household electric appliances to maintain quality control according to IEC, UL and ULC
- Performed field installation, verification, troubleshooting, electrical computations, cost estimation and component selection

3.3 Leaves Granted by the University

3.3.1 Sabbatical Leave

2014 - 2015 Granted by the University of New Brunswick

3.4 Distinctions, Honors, Fellowships, Scholarships, and Awards

2015 IEEE-SA Emerging Technology Award
with the IEEE Ontologies for Robotics and Automation Working Group

2015 Leader's Opportunity Award
Canada Foundation for Innovation

2011 Letter from Minister of Energy, Minister Leonard, acknowledging achievement and contribution in innovation

2010 Harrison McCain Foundation Young Scholars Award
Harrison McCain Foundation

2008 Atlantis Systems International Above and Beyond Award
Awarded to employees at ASI who go Above and Beyond their job descriptions and unselfishly look for new ways to make ASI a better place to work
Atlantis Systems International, Brampton, Ontario, Canada

2007 Leader's Opportunity Award
Canada Foundation for Innovation

2006 Certificate of Appreciation
For Outstanding Service and Contributions to the Integrated Maintenance Training System Phase II (Royal Australian Air Force HUG 2.2 and Canadian Forces ECP583R2 Upgrades)
the Boeing Company

2003 – 2005 Natural Sciences and Engineering Research Council of Canada (NSERC) Postgraduate Scholarship
Natural Sciences and Engineering Research Council of Canada

2003 Ontario Graduate Scholarship (OGS)
Ontario Ministry of Training, Colleges and Universities, Ontario, Canada

2003 – 2005 UW Graduate Incentive Awards (GIA)
University of Waterloo, Waterloo, Ontario, Canada

2003 Engineering Graduate Scholarship
University of Waterloo, Waterloo, Ontario, Canada

2003 The M.F.A.M. Trophy for Outstanding Progress in K-W Toastmasters
Kitchener-Waterloo Toastmasters, Waterloo, Ontario, Canada

2001 Travel Scholarship
University of Guelph, Guelph, Ontario, Canada

2000 DAAD Graduate Scholarship in System Engineering & Management
German Academic Exchange Service, Germany

4 Dissemination of Knowledge

4.1 Instruction of Existing Courses, Development of New Courses, Improvement of Existing Courses

4.1.1 Summary of Courses Taught

Course Title	Term	Number of Enrollment	Available Assistance to Teaching
EE4323 Industrial Control	Fall 2017	20	1
EE2701 Circuits and Electronics	Fall 2016	77	2
EE3312 Systems and Control	Winter 2017	59	2.5
EE6333 Topics in Control	Winter 2017	1	0
EE4323 Industrial Control	Fall 2016	40	2
EE2701 Circuits and Electronics	Fall 2016	65	2.5
EE3312 Systems and Control	Winter 2016	49	2.5
EE6333 Topics in Control	Winter 2016	1	0
EE4323 Industrial Control	Fall 2015	20	0.5
EE2701 Circuits and Electronics	Fall 2015	80	2.5
EE3312 Systems and Control	Winter 2014	49	2.5
EE4323 Industrial Control	Winter 2014	18	0.5
EE2701 Circuits and Electronics	Fall 2013	70	2
EE6333 Topics in Control	Fall 2013	4	0
EE3312 Systems and Control	Winter 2013	43	2.5
EE4323 Industrial Control	Winter 2013	18	0.5
ME4173 Robot Kinematics	Fall 2012	15	0.5
EE6333 Topics in Control	Fall 2012	2	0
EE3312 Systems and Control	Winter 2012	45	2.5
ME4673 Introduction to Mechatronics	Winter 2012	9	0.5
ME4683 Mechatronics Applications	Fall 2011	13	0.5
EE6333 Topics in Control	Fall 2011	1	0
EE3312 Systems and Control	Winter 2011	42	2.5
ME4673 Introduction to Mechatronics	Winter 2011	13	0.5
ME4683 Mechatronics Applications	Fall 2010	13	0.5
EE4323 Industrial Control	Fall 2010	23	1.5
EE6333 Topics in Control	Fall 2010	7	0
EE6263 Topics in Robotics	Summer 2010	3	0
EE3312 Systems and Control	Winter 2010	42	2.5
ME4673 Introduction to Mechatronics	Winter 2010	12	0.5
EE4323 Industrial Control	Fall 2009	13	1.5
EE6333 Topics in Control	Fall 2009	10	0
EE3312 Systems and Control	Winter 2009	37	2.5
EE6343 Advanced Robotics and Autonomous Systems	Winter 2009	1	0
EE4323 Industrial Control	Fall 2008	22	1.5
EE6333 Topics in Control	Fall 2008	7	0

4.1.2 Details of All Courses Taught

University of New Brunswick

Winter 08 - 17 Instructor, EE3312 Systems and Control, Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada

Responsibilities: Updated the existing course; Established new experiments and lab setups for the course; Effectively used teaching aids such as Blackboard; Organized the labs; Prepared the course materials and slides; Conducted lectures and tutorials (Mathematical models of dynamic systems, linear systems, analysis in the time and frequency domain, stability, Routh-Hurwitz and Nyquist stability criteria, feedforward and feedback control, PID controllers, principles of feedback design); Held office hours; Answered questions; Designed assignments/midterms/finals; Supervised teaching assistants; Worked on makeup exams.

Number of students: 40-50

Scheduled contact hours: 6.5 hours/week

Available assistance to teaching: 2 lab teaching assistants and 1 marking teaching assistant

Fall 08 - Fall 17 Instructor, EE4323 Industrial Control, Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada

Responsibilities: Updated the existing course; Effectively used teaching aids such as Blackboard; Organized and redesigned the labs; Prepared the course materials and slides; Conducted lectures and tutorials (industrial context for the application of control theories, including system modeling and problem definition; system components and architectures; dealing with limitations and constraints - nonlinearity, disturbances - standard and advanced controls design and tuning methods; computer aided control engineering); Held office hours; Answered questions; Designed assignments/midterms/finals; Supervised teaching assistants.

Number of students: 15 - 27

Scheduled contact hours: 5.5 hours/week

Available assistance to teaching: 2 lab teaching assistants and 1 marking teaching assistant

Fall 07 - Winter 17 Instructor, EE6333 Topics in Control, Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada

Responsibilities: Updated the existing course; Effectively used teaching aids such as Blackboard; Designed the course; Conducted lectures (State Estimation; Sensor Fusion; Nonlinear Control; Unmanned Aerial Vehicles; Unmanned Ground Vehicles; Autonomous Underwater Vehicles; Navigation Systems; Fundamentals of Neural Networks; Classes of Neural Networks; Supervised Neural Networks and Training; From Classical Sets to Fuzzy Sets; Fuzzy Rule Inferencing; Fuzzy Control; State Space Problem Formulation and Representation; Uninformed Search and Heuristic Search; Genetic Algorithms; Behavior-Based AI); Held office hours; Designed assignments; Supervised research projects.

Number of students: 1-10

Scheduled contact hours: 4 hours/week

Available assistance to teaching: None

Fall 13 - Fall 17 Instructor, EE2701 Circuits and Electronics, Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada

Responsibilities: Updated the existing course; Effectively used teaching aids such as Desire2Learn; Designed the course; Conducted lectures/labs (Circuits: Basics of cir-

cuit theory, Kirchoff's laws, energy flow in electric circuits, elements, superposition, loop and node equation analysis, Thevenin and Norton equivalents, dependent sources; Dynamics of Circuits and AC Circuit Analysis: Inductors and capacitors, first-order transient response of RL and RC circuits, introduction to alternating current, phasors, impedance, AC power and energy, transformers; Electronics: The pn junction, diodes, transistors (bipolar and FET), digital signals, asynchronous and sequential digital systems, computers; frequency domain representation of signals, filter, feedback concept and operational amplifier circuits); Held office hours; Designed assignments/quizzes.
Number of students: 70
Scheduled contact hours: 6.5 hours/week
Available assistance to teaching: 2

Fall 12 Instructor, ME4173 Robot Kinematics, Mechanical Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada
Responsibilities: Updated the existing course; Effectively used teaching aids such as Blackboard; Designed the course; Conducted lectures/labs (Structure and specification of robotic manipulators. Homogeneous transformations and link descriptions. Manipulator forward and inverse displacement solutions. Jacobians in the velocity and static force domains. Singular configurations and workspace analysis. An introduction to trajectory planning and manipulator dynamics.); Held office hours; Designed assignments/quizzes; Supervised research projects.
Number of students: 10-20
Scheduled contact hours: 6.5 hours/week
Available assistance to teaching: 0.5

Winter 10 - 12 Instructor, ME4673 Introduction to Mechatronics, Mechanical Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada
Responsibilities: Updated the existing course; Effectively used teaching aids such as Blackboard; Organized and redesigned the labs; Prepared the course materials and slides; Conducted lectures and tutorials (sensors, actuators, control systems, electrical systems, hydraulic systems, pneumatic systems, data acquisition systems, etc.); Held office hours; Answered questions; Designed assignments/quizzes; Designed and conducted labs; Supervised teaching assistants.
Number of students: 9-12
Scheduled contact hours: 5.5 hours/week
Available assistance to teaching: 1 lab teaching assistant

Fall 10 - 11 Instructor, ME4683 Mechatronics Applications, Mechanical Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada
Responsibilities: Updated the existing course; Effectively used teaching aids such as Blackboard; Organized and redesigned the labs; Prepared the course materials and slides; Conducted lectures and tutorials (kinematics, dynamics, sensors, actuators, microcontrollers, signal processing, filters, control systems, PLC, motion planning, etc.); Held office hours; Answered questions; Designed assignments/quizzes; Designed and conducted labs; Supervised teaching assistants.
Number of students: 12
Scheduled contact hours: 5.5 hours/week
Available assistance to teaching: 1 lab teaching assistant

Winter 08 - 09 Instructor, EE4913 Independent Project, Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada
Responsibilities: Supervised student independent projects

Winter 09 Instructor, EE6343 Advanced Robotics and Autonomous Systems, Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada
Responsibilities: New course development, preparation and course instruction
Scheduled contact hours: 3 hours/week
Available assistance to teaching: none

Fall 07 - 08 Instructor, EE4040 EE Design Project, Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada
Responsibilities: Supervised fourth year design projects

Fall 07 Guest Lecturer, EE4333 Robotics, Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada
Responsibilities: Conducted a lecture on behavior-based robots and genetic algorithms

University of Ontario Institute of Technology

Winter 07 Teaching Assistant, ENGR 4730U Nuclear Reactor Instrumentation and Control (Instructor: Professor Lixuan Lu), Energy Systems and Nuclear Science, University of Ontario Institute of Technology, Oshawa, Ontario, Canada
Responsibilities: Held office hours, answered questions, designed assignments (monitoring systems, analog control systems, digital control systems, open loop control & closed loop control, block diagrams, PID controllers, on off controllers, differential equations, Laplace transform, transfer functions, sensitivity, stability, steady state error for unity & non-unity feedback systems, settling time, overshoot, Routh-Hurwitz criterion, step response, etc.), graded assignments/exams, invigilated exams, designed and supervised design projects (temperature control and water level control for steam generators using PID controllers and Bang Bang controllers)
Number of students: 47

Fall 06 Teaching Assistant, ENGR 3740U Scientific Instrumentation (Instructor: Professor Lixuan Lu), Energy Systems and Nuclear Science, University of Ontario Institute of Technology, Oshawa, Ontario, Canada
Responsibilities: Held office hours, conducted laboratories and tutorial sessions (taught students the broad range of experimental measurement techniques available for mechanical and general engineering applications; explained the general behavior of different measurement techniques, such as pressure, flow, and temperature; emphasized the use of uncertainty analysis and statistical data analysis in estimating the accuracy of measurements), graded assignments/exams, invigilated exams, and supervised projects
Number of students: 46

Fall 06 Teaching Assistant, ENGR 2360U Electric Power Systems (Instructor: Professor Lixuan Lu), Energy Systems and Nuclear Science, University of Ontario Institute of Technology, Oshawa, Ontario, Canada
Responsibilities: Held office hours, conducted tutorial sessions (modeling power system equipment and analyzing their responses to system disturbances, as well as their deployments in coordinated power network operations; fundamental topics of power flow, power system stability and transmission lines, power system analysis using logical discussions and numerous examples), graded assignments/exams, and invigilated exams
Number of students: 12

University of Waterloo

Winter 07 Guest Lecturer, ECE 355 Computer Engineering (Instructor: Professor Ladan Tahvildari), Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, Canada
Responsibilities: Conducted a lecture on Entity Relationship Diagram
Number of students: 70

Fall 05 Teaching Assistant, MTE 241 Introduction to Computer Structures and Real-Time Systems (Instructor: Professor Paul Dasiewicz) Mechatronics Engineering, University of Waterloo, Waterloo, Ontario, Canada
Responsibilities: Supervised the course project
Number of students: 101

Spring 05 Teaching Assistant, ECE 457 Applied Artificial Intelligence (Instructor: Professor Paul Dasiewicz) Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, Canada
Responsibilities: Marked assignments and exams, ran tutorials (breadth first search, depth first search, uniform cost search, A* search, constraint satisfaction problem, game theories, fuzzy logic, and neural networks), held office hours, responded to students' questions, and supervised projects
Number of students: 110

April 05 Guest Lecturer, ESL Non Credit Course - Advanced and High Intermediate (Instructor: Ms. Pat Skinner), Resurrection College, University of Waterloo, Waterloo, Ontario, Canada
Responsibilities: Facilitated a workshop on public speaking
Number of students: 30

Spring 03 - 04 Teaching Assistant, SYDE 192 Introduction to Digital Systems (Instructor: Professor Paul Fieguth and Professor Otman Basir), Systems Design Engineering, University of Waterloo, Waterloo, Ontario, Canada
Responsibilities: Instructed labs (chips, gates, EPROM, FPGA, PLD, micro-controllers, etc.), marked assignments and exams, invigilated exams, ran tutorials, and conducted lectures
Number of students: 89 - 90

Fall 03 Teaching Assistant, SYDE 161 Introduction to Systems Design Engineering (Instructor: Professor Carolyn MacGregor and Ms. June Lowe), Systems Design Engineering, University of Waterloo, Waterloo, Ontario, Canada
Responsibilities: Taught engineering drafting and AutoCAD 2000, marked assignments and exams, instructed labs, and invigilated exams
Number of students: 90

Winter 03 Teaching Assistant, SYDE 350 Introduction to Control Systems (Instructor: Professor Fakhri Karray), Systems Design Engineering, University of Waterloo, Waterloo, Ontario, Canada
Responsibilities: Instructed labs, marked assignments and exams, invigilated exams, ran tutorials (fundamental concepts of control theories for linear time invariant systems, dynamic feedback systems using frequency domain methods based on Bode plots and root locus approaches, dynamic system performance, stability, well-known controllers such as PID and PD, and Phase-Lead and Phase-Lag compensators)
Number of students: 88

University of Guelph

Fall 04 Guest Lecturer, ENGG 6580 Advanced Control Systems (Instructor: Professor Simon Yang), School of Engineering, University of Guelph, Guelph, Ontario, Canada
Responsibilities: Presented a seminar on fuzzy logic, behavior-based robotics and multi-agent systems
Number of students: 10

Winter 02 Teaching Assistant, ENGG 3400 Introduction to Mechatronic Systems Design (Instructor: Professor John Zelek), School of Engineering, University of Guelph, Guelph, Ontario, Canada

Responsibilities: Instructed labs (infrared sensors, hall-effect sensors, encoders, photocells, bumpers, magnetometers, potentiometers, DC motors, servo motors and Handyboard), marked assignments, invigilated exams, and edited course materials
Number of students: 38

4.2 Development of Innovative Teaching Aids and Techniques

2011 Invited representatives from the Canadian Intellectual Property Office to facilitate workshops on intellectual properties for engineering students (ME4673 - Introduction to Mechatronics; EE3312 - Introduction to Control Systems)

2008 – Showed YouTube videos of real-world applications of robotic projects in class so that students could understand how to design control systems for real-world nonlinear systems; introduced the latest research results to undergraduate students (EE4323-Industrial Control Systems; EE3312-Introduction to Control Systems; ME4673-Mechatronics; ME4683-Mechatronics Applications)

2008 – For Generation Y, used online course management tools

2008 Invited representatives from National Instruments to conduct a hands-on session for undergraduate students taking EE4323-Industrial Control Systems in the Department of Electrical and Computer Engineering at the University of New Brunswick; Students got a chance to learn and practice data acquisition systems, sensors, and the Labview software; Students were able to better understand sensors and data acquisition systems used in industry; students also got more interested in learning industrial control systems because of the exposure to real-world applications and industry

2008 Designed and provided a hands-on session at Grand Manan Community School to show high school students how sensors can be used to measure distances

4.3 Involvement in Curriculum Development

4.3.1 Seminars and Workshops Attended

2014 49. Accommodating Students with Different Needs

48. One size fits none: rethinking student course evaluation surveys

2012 47. Entrepreneurship Accelerator Program

46. How Students Learn

45. Mastering Solution Sales - Enterprise Fredericton

2011 44. Teaching Essentials - Creating Meaningful Assessments/Providing Timely Feedback

43. Teaching Essentials - The Practicalities

42. Teaching Essentials - Understanding Your Students/Developing a Rapport

41. Teaching Essentials - Structuring Course Contents/Providing Effective Instructions

40. Measuring Learning: The Ultimate Teaching Evaluation

39. Universal Instructional Design Workshop

38. Who Runs this Class?: Encouraging Student Ownership

37. Student Faculty Interaction

2010 36. Intellectual Property Protection and Commercialization Workshop

35. Blackboard Groups & Assignments

34. Citation Searching

33. Effective Teaching Institute - Bridging the Gap: Working with Today's Students

32. Spring Teaching Showcase
31. Disruptive Classroom Behavior - Keys to Managing Difficult College Students
30. No More Peeing in the Pool - Workplace Communication Skills

2009 29. Using Blackboard's Safeassign Feature to Detect Plagiarism
28. UNB Libraries Annual Faculty Institute
27. Teaching Education in Canada: State of the Art and Beyond
26. Instructors Forum: Conducting Group Work in Large Classes
25. Engaging the Disengaged with Experiential Learning
24. Teaching Apprenticeship/Mentoring Model
23. Using Course Portfolios to Document Student Learning
22. How Students Learn
21. Think NB exhibition

2008 20. Gain Some Insight into Your Style
19. Motivating Student Learning
18. Can I use this in my Course?
17. When a Student's Academic and Personal Life Collide: What can a Faculty Advisor Do?
16. Avoiding Plagiarism
15. NB Fredericton Showcase
14. UNB Libraries Annual Faculty Institute
13. Large Classes Instructors Forum
12. Sharing Teaching Expertise Online
11. Export Development Canada Seminar
10. Learning Techniques Symposium at UNB
9. Linking student assessment with course and program evolution
8. A New Look at Customer Service
7. Dealing with difficult people
6. Getting the Right Employees

2007 5. Group work and how to use videos in teaching
4. Workplace conflict management workshop
3. Supervisory skills workshop
2. Hiring of employees workshop
1. Workplace health seminar

4.4 Organization of Field Schools and Labs

2007 – 2016 Participated in the upgrade of the controls lab, University of New Brunswick

5 Research, Scholarly or Creative Activity

5.1 Selected Full Length, Fully Refereed Journal Articles

I am proud that my students are capable of publishing articles in top journals in Electrical & Computer Engineering such as *IEEE Robotics and Automation Magazine* (highest impact factor in robotics) *IEEE/ASME Transactions on Mechatronics* (highest impact factor of manufacturing engineering journals), *IEEE Transactions on Neural Networks*, and *IEEE Transactions on Systems, Man and Cybernetics*, etc. Students under my supervision have been invited to serve as reviewers for top journals and conferences such as *IEEE Transactions on SMC* and *IEEE International Conferences on Robotics and Automation (ICRA)*.

2017 33. Liam Paull, Mae Seto, John Leonard, **Howard Li**, "Probabilistic cooperative mobile robot area coverage and its application to autonomous seabed surveying," *International Journal of Robotics Research*. **best journal in robotics** [student paper]

32. Sajad Saeedi, Carl Thibault, Michael Trentini, **Howard Li**, "3D Mapping for Autonomous Quadrotor Aircraft," *Unmanned Systems*. [student paper]

31. Sandro Rama Fiorini, Julita Bermejo-Alonso, Paulo Goncalves, Edison Pignaton de Freitas, Alberto Olivares Alarcos, Joanna Isabelle Olszewska, Edson Prestes, Craig Schlenoff, S. Veera Ragavan, Signe Redfield, Bruce Spencer, and **Howard Li**, "A Suite of Ontologies for Robotics and Automation," *IEEE Robotics and Automation Magazine*. **highest impact factor in robotics** [student paper]

2016 30. Behzad Bayat, Julita Bermejo-Alonso, Joel Luis Carbonera, Tullio Facchinetti, Sandro R. Fiorini, Paulo Gon calves, Vitor A. M. Jorge, Maki Habib, Alaa Khamis, Kamilo Melo, Bao Nguyen, Joanna Isabelle Olszewska, Liam Paull, Edson Prestes, S. Veera Ragavan, Sajad Saeedi G., Ricardo Sanz, Mae Seto, Bruce Spencer, Michael Trentini, Amirkhosro Vosughi, and **Howard Li**, "Requirements and and Latest Progress Towards an Ontology for Autonomous Robots," *Industrial Robot*. Volume 43, Issue 5. **one of the highest impact factor robotics journals** [student paper]

29. Sajad Saeedi G., Amr Nagaty, Carl Thibault, Michael Trentini and **Howard Li**, "Perception and Navigation for Autonomous Rotorcraft," *International Journal of Robotics and Automation*. **one of the highest impact factor robotics journals** [student paper]

28. Amr Nagaty, Carl Thibault, Mae Seto, Michael Trentini, and **Howard Li**, "Construction, Modeling and Control of an Autonomous Unmanned Aerial Vehicle Testbed," *Canadian Aeronautics and Space Journal*

2015 27. Sajad Saeedi, Michael Trentini, Mae Seto, and Howard Li, "Multiple-robot Simultaneous Localization and Mapping - A Review," *Journal of Field Robotics*. **best journal in field robotics** [student paper]

26. Amr Nagaty, Carl Thibault, Michael Trentini, and Howard Li, "Probabilistic Cooperative Target Localization," *IEEE Transactions on Automation Science and Engineering* [student paper]

25. Sajad Saeedi, Carl Thibault, Michael Trentini, and Howard Li "The COBRA Fixed-Wing Georeferenced Imagery Dataset," *International Journal of Intelligent Unmanned Systems* [student paper]

24. Sajad Saeedi, Liam Paull, Michael Trentini and **Howard Li**, "Occupancy Grid Map Merging for Multiple Robot Simultaneous Localization and Mapping," *International Journal of Robotics and Automation*. **one of the highest impact factor robotics journals** [student paper]

2014 23. Sandro Rama Fiorini, Joel Luis Carbonera, Paulo Goncalves, Vitor A. M. Jorge, Vitor Fortes Rey, Tamas Haidegger, Mara Abel, Signe A. Redfield, Stephen Balakirsky, Veera Ragavan, Howard Li, Craig Schlenoff, Edson Prestes, "Extensions to The Core Ontology for Robotics and Automation," *Robotics and Computer Integrated Manufacturing*. Elsevier.

22. Sajad Saeedi, Liam Paull, Michael Trentini, and **Howard Li**, "Group Mapping - A Topological Approach to Map Merging for Multiple Robots," *IEEE Robotics and Automation Magazine*. **highest impact factor in robotics** [student paper]

21. Sajad Saeedi G., Liam Paull, Michael Trentini and **Howard Li**, "Map merging for multiple robots using Hough peak matching," *Robotics and Autonomous Systems*. **one of the highest impact factor robotics journals** [student paper]

2013 20. Liam Paull, Carl Thibault, Amr Nagaty and **Howard Li**, "Sensor-Driven Area Coverage for an Autonomous Fixed-Wing Unmanned Aerial Vehicle," *IEEE Transactions on Systems, Man and Cybernetics, Part C - Applications and Reviews*. **Impact factor: 2.009** [student paper]

19. Tamas Haidegger, Marcos E. Barreto, Paulo Goncalves, Maki Habib, Veera Ragavan, **Howard Li**, Alberto Vaccarella, Roberta Perrone, Edson Prestes, "Applied ontologies and standards for service robots," *Robotics and Autonomous Systems*. Impact factor: 1.448. **#6 journal of robotics journals**

18. Amr Nagaty, Sajad Saeedi, Carl Thibault, Mae Seto, and **Howard Li** "Control and Navigation Framework for Quadrotor Helicopters," *Journal of Intelligent & Robotic Systems*, April 2013, Volume 70, Issue 1-4, pp 1-12. Cited by 44. Impact factor: 0.829 **one of the highest impact factor robotics journals** [student paper]

2012 17. Liam Paull, Sajad Saeedi, Mae Seto, **Howard Li**, "Sensor Driven Online Coverage Planning for Autonomous Underwater Vehicles," *IEEE Transactions on Mechatronics*. Cited by 35. **highest impact factor of manufacturing engineering journals** [student paper]

16. Liam Paull, Sajad Saeedi, Mae Seto, **Howard Li**, "AUV Navigation and Localization: A Review," *IEEE Journal of Oceanic Engineering*. Cited by 230. **#3 journal of ocean engineering journals** [student paper]

2011 15. Sajad Saeedi G., Liam Paull, Michael Trentini and **Howard Li**, "A Neural Network-based Multiple Robot Simultaneous Localization and Mapping," *IEEE Transactions on Neural Networks*. Cited by 35. **Acceptance Rate: less than 10%** [student paper]

2010 14. Yi Fu, **Howard Li**, and Mary Kaye, "Hardware/Software Co-Design for a Fuzzy Autonomous Road-Following System," *IEEE Transactions on Systems, Man and Cybernetics, Part C - Applications and Reviews*. Cited by 5. **Acceptance Rate: 16%** [student paper]

13. **Howard Li**, Fakhreddine Karray, and Otman Basir, "An Optimization Algorithm for the Coordinated Hybrid Agent Framework," *International Journal of Robotics and Automation*. vol. 25 no. 1. Cited by 3. **one of the highest impact factor robotics journals**

2009 12. **Howard Li**, Simon Yang, and Mae Seto, "Neural Network Based Path Planning for A Multi-Robot System with Moving Obstacles," *IEEE Transactions on Systems, Man and Cybernetics, Part C - Applications and Reviews*. Volume: 39, Issue: 4. June 2009. Cited by 66. **Acceptance Rate: 16%**

2008 11. **Howard Li**, Fakhreddine Karray, Otman Basir, and Insop Song, "A Framework for Coordinated Control of Multi-Agent Systems and Its Applications," *IEEE Transactions on Systems, Man, and Cybernetics - Part A: Systems and Humans, Volume: 38, Issue: 3*. June 2008. Cited by 23. **Acceptance Rate: 10%**

2004 10. Simon X. Yang, **Hao Li**, Max Q.-H. Meng and Peter X. Liu, "An embedded fuzzy controller for a behavior-based mobile robot with guaranteed performance," *IEEE Transactions on Fuzzy Systems*. Vol. 12, No. 1, pp. 436-446, 2004. Cited by 93.

9. **Hao Li** and Simon X. Yang, "A Behavior-Based Mobile Robot with a Visual Landmark Recognition System," *IEEE/ASME Transactions on Mechatronics*. **highest impact factor of manufacturing engineering journals** Vol. 8, No. 3, pp. 695-708, 2003. Cited by 75.

8. ... ...

5.2 Selected Full Length, Fully Refereed Conference Papers

Graduate students under my supervision have successfully published papers in best conference proceedings in robotics and automation, such as *IEEE Conference on Automation Science and Engineering (CASE)*, IEEE International Conference on Robotics and Automation (ICRA) and *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*.

2017 65. Paulo Gonalves, Sandro Fiorini, Joanna Isabelle Olszewska, Howard Li, "Ontology for Autonomous Robots" *2017 IEEE International Symposium on Robot and Human Interactive Communication*, Lisbon, Portugal, August 28-31.

2016 64. Behzad Bayat, Naveen Crasta, Howard Li, Auke Ijspeert, "Optimal Search Strategies for Pollutant Source Localization," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016)*, South Korea. **one of the best conference proceedings in robotics and automation** [student paper]

63. Sajad Saeedi, Carl Thibault, Amr Nagaty, Michael Trentini, and Howard Li, "The COBRA Heterogenous Multiple-robot Localization and Mapping Dataset," *IEEE CCECE 2016* [student paper]

62. Sajad Saeedi, Amr Nagaty, Carl Thibault, Michael Trentini, and Howard Li, "3D Mapping and Navigation for Autonomous Quadrotor Aircraft," *IEEE CCECE 2016* [student paper]

2015 61. Sajad Saeedi, Michael Trentini, and Howard Li, "A Hybrid Approach for Multiple-robot SLAM with Particle Filtering," *2015 IEEE IROS* [student paper]

60. Amr Nagaty, Carl Thibault, Mike Trentini, Tullio Facchinetti, and Howard Li, "Construction, Modeling and Control of A Quadrotor for Target Localization", *IEEE CCECE 2015*. [student paper]

59. Sajad Saeedi, Mae Seto, and Howard Li "Fast Monte Carlo Localization of AUV Using Acoustic Range Measurement", *IEEE CCECE 2015*. [student paper]

2014 58. Amr Nagaty, Carl Thibault, Mike Trentini and Howard Li, "Probabilistic Cooperative Target Localization", *International Conference on Intelligent Unmanned Systems*. [student paper]

57. Sajad Saeedi, Amr Nagaty, Carl Thibault, Michael Trentini, and Howard Li, "Perception and Navigation for Autonomous Rotorcraft", *International Conference on Intelligent Unmanned Systems*. [student paper]

56. Liam Paull, Mae Seto, and Howard Li, "Area Coverage Planning that Accounts for Pose Uncertainty with an AUV Seabed Surveying Application", *2014 IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong. **best conference proceeding in robotics and automation** [student paper]

2013 55. Amr Nagaty, Carl Thibault, Mae Seto, Michael Trentini, and Howard Li, "Construction, Modeling and Control of an Autonomous Unmanned Aerial Vehicle Testbed for Target Localization,"

2013 IEEE International Conference on Robotics and Biomimetics (ROBIO), China. December 2013. **one of the best conference proceedings in robotics and automation** [student paper]

54. Tamas Haidegger, Marcos Barreto, Paulo J.S. Goncalves, Maki K. Habib, S.Veera Ragavan, Howard Li, Alberto Vaccarella, Roberta Perrone, Edson Prestes, "Robot Ontologies for Sensor- and Image-Guided Robotic Surgery Systems," *2013 IEEE International Symposium on Robotic and Sensors Environments*, Washington DC, USA.

2012 53. Amr Nagaty, Sajad Saeedi G., Carl Thibault, Mae Seto, and Howard Li, "Control and Navigation Framework for Quadrotor Helicopters," *2012 International Conference on Unmanned Aircraft Systems*, Philadelphia, Pennsylvania. [student paper]

52. Sajad Saeedi Gharahbolagh (135321), Liam Paull (136946), Michael Trentini (117061), Mae Seto (135809), Howard Li (118320), "Map Merging Using Hough Peak Matching," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012)*, Vilamoura, Algarve, Portugal. **one of the best conference proceedings in robotics and automation** [student paper]

51. Sajad Saeedi Gharahbolagh (135321), Liam Paull (136946), Michael Trentini (117061), Mae Seto (135809), Howard Li (118320), "Efficient Map Merging Using a Probabilistic Generalized Voronoi Diagram," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012)*, Vilamoura, Algarve, Portugal. **one of the best conference proceedings in robotics and automation** [student paper]

50. Craig Schlenoff (107118), Edson Prestes (117913), Raj Madhavan (102514), Paulo Gonalves (140526), Howard Li (118320), Stephen Balakirsky (105490), Thomas Kramer (154551), Emilio Miguelaez (117331), "An IEEE Standard Ontology for Robotics and Automation," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012)*, Vilamoura, Algarve, Portugal. Cited by 43. **one of the best conference proceedings in robotics and automation**

49. Liam Paull (136946), Gaetan Severac (156012), Guilherme V. Raffo (152669), Julian Mauricio Angel (156013), Harold Boley (156014), Maki Khalil Habib (116228), Bao Nguyen (156015), Veera Ragavan Sampath Kumar (112636), Sajad Saeedi Gharahbolagh (135321), Ricardo Sanz (115675), Mae Seto (135809), Aleksandar Stefanovski (118692), Michael Trentini (117061), Howard Li (118320), "Towards An Ontology for Autonomous Robots," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012)*, Vilamoura, Algarve, Portugal. **one of the best conference proceedings in robotics and automation** [student paper]

48. Liam Paull (136946), Sajad Saeedi Gharahbolagh (135321), Mae Seto (135809), Howard Li (118320), "Sensor Driven Online Coverage Planning for Autonomous Underwater Vehicles," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2012)*, Vilamoura, Algarve, Portugal. **one of the best conference proceedings in robotics and automation** [student paper]

2011 47. Sajad Saeedi G., Liam Paull, Michael Trentini and Howard Li, "Multiple Robot Simultaneous Localization and Mapping," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011)*, San Francisco, USA. September 25-30, 2011 **one of the best conference proceedings in robotics and automation** [student paper]

46. Sajad Saeedi G., Liam Paull, Michael Trentini and Howard Li, "A Neural Network-based Multiple Robot Simultaneous Localization and Mapping," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011)*, San Francisco, USA. September 25-30, 2011 **one of the best conference proceedings in robotics and automation** [student paper]

45. Liam Paull, Sajad Saeedi, Mae Seto, Howard Li, "A Multi-Agent Framework for Autonomous Underwater Vehicles for Mine Countermeasures with MOOS-IvP," *International Conference on Autonomous and Intelligent Systems*, Vancouver, Canada, 2011. **Acceptance Rate: 60%** [student paper]

2010 44. Liam Paull, Sajad Saeedi, Howard Li, and Vincent Myers, "An Information Gain Based Adaptive Path Planning Method for an Autonomous Underwater Vehicle using Sidescan Sonar," *IEEE Conference on Automation Science and Engineering (CASE 2010)*, Toronto, ON, Canada 2010. **Acceptance Rate: 50%** [student paper]

43. Mae Seto, and Howard Li, "On-Board AUV Autonomy through Adaptive Fins Control," *IEEE Conference on Automation Science and Engineering (CASE 2010)*, Toronto, ON, Canada 2010.

2009 42. Yi Fu, Howard Li, and Mary Kaye, "Design and Stability Analysis of a Fuzzy Controller for Autonomous Road Following," *IEEE Intelligent Vehicle Symposium*, Xian, China, 2009. [student paper]

2008 41. Howard Li, Simon Yang, and Yevgen Biletskiy, "Neural Network Based Path Planning for A Multi-Robot System with Moving Obstacles," *The 4th Annual IEEE Conference on Automation Science and Engineering (CASE 2008)*, Washington DC, USA, 2008.

40. ... ...

5.3 Book Chapters

I have co-authored textbooks with leading researchers such as Dr. Paul Newman (Oxford University), Dr. Mae Seto (Dalhousie University), Dr. John Leonard (Massachusetts Institute of Technology), Dr. Mike Benjamin (Massachusetts Institute of Technology), and Dr. Signe Redfield (Office of Naval Research).

2012 3. "Path Planning for Autonomous Underwater Vehicles," *Marine Robot Autonomy.* Springer Science, New York. 2012. [student work]

2010 2. "Framework for Coordinated Control of Multi-Agent Systems and Its Applications," *Innovative Multi-agent Systems: Foundation & Innovative Applications.* Springer-Verlag, Germany. 2010.

2007 1. "Chapter 2, Robotic Application of Mechatronics," *Mechatronic Systems - Devices, Design, Control, Operation, and Monitoring.* Taylor and Francis Group. 2007.

5.4 Editorial Responsibilities

2016 8. Guest Editor, Unmanned Systems

2016 - 7. IEEE Canada Conference Editorial Board (CEB)

2015 - 6. Guest Editor, Computational Intelligence and Neuroscience

5. Associate Editor, International Journal of Robotics and Automation

4. Associate Editor, International Journal of Knowledge Engineering and Soft Data Paradigms

2014 3. Guest Editor, Unmanned Systems

2012 2. Associate Editor, International Journal of Advanced Robotic Systems

2010 1. Guest Editor, International Journal of Intelligent Defence Support Systems (IJIDSS) ISSN (Online): 1755-1595 - ISSN (Print): 1755-1587

5.5 Theses

2006 2. Howard Li, "A framework for coordinated control of multi-agent systems," *Doctor of Philosophy in Electrical and Computer Engineering*, Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, Canada

2002 1. "The development of a biologically inspired mobile robot with a visual landmark recognition system," *Master of Science in Engineering Systems and Computing*, School of Engineering, University of Guelph, Guelph, Ontario, Canada

5.6 Creation of, Maintenance of or Contributions to Data Banks, Registries, Tables or Collections of Existing Knowledge Recognized and Used by Others

2012 1. Open Source Software: Control and Navigation Framework for Quadrotor Helicopters, http://sourceforge.net/projects/gazebo-quad-sim Downloaded and used by researchers from Germany, India, Canada, Korea, Brazil, Tunisia, Turkey, Indonesia, Sweden, China, Russia, and Spain

5.7 Keynote Speech

2015 3. Delivered a keynote speech on Probabilistic Autonomous Robots, IAC, Cairo, Egypt, April 8, 2015.

2013 2. Delivered a seminar titled "Information Fusion in Robotics and Unmanned Vehicles" to *Center for Discrete Mathematics & Theoretical Computer Science Founded as a National Science Foundation Science and Technology Center*, Rutgers University, NJ, USA. September 20, 2013.

2012 1. Delivered a presentation titled "Robotics in the Household Appliance Industry" to the *Chinese Association of Refrigeration*, China. September, 2012.

5.8 Presentations, Seminars and Workshops

2017 45. Delivered a presentation on Cooperative Unmanned Aerial Vehicles, LISSI, UPEC, Paris, France, Sept 4, 2017

44. Delivered a presentation on Autonomous Robotis, IEEE ROMAN, Lisbon, Portugal, Sept 1, 2017

2015 43. Delivered a presentation on Autonomous Underwater Robots for Environment Monitoring, EPFL, Lausanne, Switzerland, August 27, 2015

42. Delivered an invited presentation on Perception, Navigation, and Target Localization for Autonomous Robots, Conference on Computer and Robot Vision, Halifax, NS, Canada, June 4, 2015

41. Delivered a presentation on Autonomous Robots and Multiple Robot SLAM, Autonomous Systems Lab, ETH Zurich, Zurich, Switzerland, April 29, 2015

40. Delivered a presentation on Autonomous Robots and Multiple Robot SLAM, Laboratory of Intelligent Systems, EPFL, Lausanne, Switzerland, April 24, 2015

39. Delivered a presentation on Autonomous Aerial and Underwater Robots, EPFL and Swiss National Centre of Competence in Research, Lausanne, Switzerland, Feb 13, 2015

2014 38. Delivered a presentation on Perception, Navigation, and Control of Unmanned Aerial Vehicles, University of Pavia, Pavia, Italy, Oct 27, 2014

37. Delivered a presentation on Perception, Navigation, and Control of Unmanned Aerial Vehicles, Polytech Milano, Milan, Italy, Oct 20, 2014

36. Delivered a presentation on Perception, Navigation, and Control of Unmanned Aerial Vehicles, Rutgers University, New Jersey, April 15, 2014

35. Delivered a presentation on Civilian Use of Unmanned Aerial Vehicles, SERG International, Pittsburg, Pennsylvania, Feb 6, 2014
34. Delivered a presentation on Unmanned Aerial Vehicles and Applications, Hong Kong University of Science and Technology, Hong Kong, Feb 24, 2014

2013 33. Delivered a seminar on Unmanned Aerial Vehicles, Beijing Jiao Tong University, Beijing, China, May 22, 2013

32. Delivered a seminar on robotics vacuum cleaners, Ecovacs Robotics Ltd. Suzhou, China. May 21, 2013
31. Delivered a seminar on Robotic Applications in the Wood Industry, Hugh John Flemming Forestry Complex, Fredericton, New Brunswick, Canada. Feb 12, 2013

2012 30. Delivered a presentation on unmanned systems to Lockheed Martin, Fredericton, New Brunswick, Canada. Sept 11, 2012

29. Delivered a Webinar titled Perception and Navigation of Autonomous Vehicles, for "Minesweepers: Towards a Landmine-Free Egypt - First National Competition for Humanitarian Demining," April 28, 2012
28. Hosted a poster presentation at the Pond-Deshpande Entrepreneurship Conference - Building a Smarter New Brunswick, Saint John Convention Center, Saint John, New Brunswick, Canada. March 26, 2012

2011 27. Presented unmanned systems research to IEEE Robotics and Automation Society. Halifax, Nova Scotia, Canada. November 7, 2011

26. Delivered a speech on the Defence R&D Canada Demonstration Day, Department of National Defence, Osborne Head, Nova Scotia, Canada. November 10, 2011
25. Presented unmanned systems research at New Brunswick Innovation Forum, Fredericton, New Brunswick, Canada. October, 2011
24. Presented a seminar at Defence Research and Development Canada (DRDC) Suffield, Suffield, Alberta, Canada (March 2011) (the seminar I presented was about UAVs, UGVs, Simultaneous Localization and Mapping, state estimation, and development of an autopilot)
23. Presented a seminar at Defence Research and Development Canada (DRDC) Valcartier, Valcartier, Quebec, Canada (February 2011) (the seminar I presented was about UAVs, UGVs, Simultaneous Localization and Mapping, state estimation, and development of an autopilot)

2010 22. Presented a seminar at MDA Corporation about unmanned systems (September 2010), Brampton, Ontario, Canada

21. Presented a seminar at Clearpath Robotics about unmanned systems (September 2010), Waterloo, Ontario, Canada
20. Presented a seminar at Aeryon Labs about unmanned systems (September 2010), Waterloo, Ontario, Canada
19. Presented a seminar about multi-agent systems and control at Ontario Power Generation (September 2010), Ajax, Ontario, Canada
18. Presented a seminar at Defence Research and Development Canada (DRDC) Suffield, Suffield, Alberta, Canada (April 2010) (the seminar I presented was about UAVs, UGVs, Simultaneous Localization and Mapping, and development of an autopilot)
17. Presented a seminar at Dalhousie University about Autonomous Underwater Vehicles, Halifax, NS, Canada (October 2010)

2009 16. Presented at School of Mechanical and Vehicular Engineering, Beijing Institute of Technology, Beijing, China (June 2009) (the seminar I presented was about robotics, intelligent vehicles, multi-agent systems and the control of multi-agent systems)

15. Presented at Key Laboratory of Machine Perception (Ministry of Education), School of Electronics Engineering and Computer Science, Peking University, Beijing, China (June 2009) (the seminar I presented was about robotics, intelligent vehicles, multi-agent systems and the control of multi-agent systems)

14. Presented a tutorial about using cameras for Robotic Tracking, Computer Robot Vision 2009, Kelowna, British Columbia, Canada (May 2009)

2008 13. Presented at the Department Research Expo, Department of Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada (October 2008) (the presentation I presented was about research in robotics and intelligent vehicles)

2007 12. Presented a seminar at Defence Research and Development Canada (DRDC) Suffield, Suffield, Alberta, Canada (October 1, 2007) (the seminar I presented was about robotics, multi-agent systems and the control of multi-agent systems)

11. Presented a seminar at the Department of Electrical and Computer Engineering, University of New Brunswick, Fredericton, New Brunswick, Canada (January 15, 2007) (the seminar I presented was about multi-agent systems and the control of multi-agent systems)

2006 10. Presented a seminar to the graduate students of the Department of Electrical & Computer Engineering, CEIT Building, University of Waterloo, Waterloo, Ontario, Canada (March 13, 2006) (the seminar I presented was about multi-agent systems and the control of multi-agent systems)

9. Presented at the AI Club, RCH Building, University of Waterloo, Waterloo, Ontario, Canada (March 2, 2006) (the seminar I presented was about artificial intelligence and its applications)

2005 8. Presented a research paper at International Conference on Mechatronics and Automation, "A Neural Network Based Intelligent Planner for the Coordinated Hybrid Agent Framework," Niagara Falls, Ontario, Canada (July, 2005)

7. Acting Chair for Session SA-P2-03 of International Conference on Mechatronics and Automation, Niagara Falls, Ontario, Canada (July, 2005)

6. Presented a seminar to the IMS Centre group, IMS Center, Odette Building, University of Windsor, Windsor, Ontario, Canada (July 12, 2005) (the seminar I presented was about multi-agent systems and control of multiple robots)

2003 5. Presented projects at MMO (Material and Manufacturing Ontario) Partnership 2003, Toronto Congress Center, Toronto, Ontario, Canada (June 2003) (the seminar I presented was about the development of an industrial overhead crane)

4. Presented a research paper at UW Graduate Student Research Conference, "Optimization of a Non-Time Based Motion Controller for a Mobile Robot," Davis Center, University of Waterloo, Waterloo, Ontario, Canada (April 2003) (the seminar I presented was about the design of a non-time based controller for mobile robots)

2002 3. Presented projects at MMO (Material and Manufacturing Ontario) Partnership 2002, Toronto Congress Center, Toronto, Ontario, Canada (June 2002) (the posters I presented was about Internet-based remote control and behavior-based mobile robots)

2001 2. Prepared with other engineers for the International Symposium on Evolutionary Robotics 2001 at the Canadian Embassy, Tokyo, Japan (October 2001)

1999 1. Presented at the UNDP Multi-Lateral Funds Project - CFC Substitution for China's Refrigeration Industry Conference, Kunming, Yunnan, China (1999) (the seminar I presented was about using flammable refrigerant in refrigerators and air conditioners and the related safety issues)

5.9 Professional Services to Governmental and Industrial Associations, Educational Institutions, Granting Agencies, etc.

5.9.1 External Appraisal Committee - Evaluation of Faculty Promotion Applications

2012 Carleton University

5.9.2 Regular Consultation by Established Researchers or Authorities

2012 – International:
Chinese house hold appliance industry (on service robots)

2007 – Governmental agencies:
Defence Research and Development Canada - Suffield, Alberta, Canada
Defence Research and Development Canada - Atlantic, Nova Scotia, Canada
Defence Research and Development Canada - CORA, Ottawa, Ontario, Canada

2008 Atlantic Mini Fridge

2007 – 2008 Shore Consulting Group, Toronto, Ontario, Canada

2003 Alt Software Inc., Waterloo, Ontario, Canada

2003 Christie Digital Systems Inc., Kitchener, Ontario, Canada

5.9.3 Referee and Review Activities

I have reviewed numerous manuscripts written by leading researchers in the world.

Selected Top Journals Refereed

39. International Journal of Robotics Research (2016 -)
38. Journal of Field Robotics (2016 -)
37. IEEE Transactions on Pattern Analysis and Machine Vision (2014 -)
36. Journal of Aerospace Engineering (2014 -)
35. IEEE Transactions on Cybernetics (2013 -)
34. IEEE Transactions on Industrial Electronics (2012 -)
33. Marine Robot Autonomy, Springer Science Book (2012)
32. IEEE Journal of Oceanic Engineering (2011 -)
31. IEEE Transactions on Control Systems Technology (2007 -)
30. Robotica, Cambridge (2009 -)
29. IEEE Transactions on Neural Networks and Learning Systems (2008 -)
28. IEEE/ASME Transactions on Mechatronics (2007 -)
27. IEEE Transactions on Systems, Man, and Cybernetics - Part A (2011 -)
26. IEEE Transactions on Systems, Man, and Cybernetics - Part B: Cybernetics (2006 -)
25. IEEE Transactions on Systems, Man, and Cybernetics - Part C: Applications and Reviews (2006 -)
24. Robotics and Autonomous Systems, Elsevier (2010 -)
23. IEEE Transactions on Vehicular Technology (2009 -)
22. IEEE Computational Intelligence Magazine (2008 -)

21. IEEE Transactions on Robotics (2005 -)
20. ... ...

Selected Top Conferences Refereed

22. IEEE International Conference on Robotics and Automation - ICRA (2008 -)
21. IEEE Conference on Automation Science and Engineering - CASE (2008 -)
20. IEEE/RSJ International Conference on Intelligent Robots and Systems - IROS (2009 -)
19. IEEE Intelligent Vehicles Symposium (2009 -)
18. IEEE International Symposium on Intelligent Control 2005/13th Mediterranean Conference on Control and Automation (2005 -)
17. American Control Conference (2004 -)
16. IEEE Conference on Decision and Control (2003 -)
15. ... ...

5.10 Membership and Active Involvement in Professional and Learned Societies

5.10.1 Professional Affiliations

- AUVSI (Association of Unmanned Vehicle Systems International) - Member
- Unmanned Systems Canada - Member
- IEEE (Institute of Electrical and Electronic Engineers) - Senior Member
- Professional Engineers Ontario (PEO), Ontario, Canada - Registered Professional Engineer
- American Institute of Aeronautics and Astronautics, USA - Member
- Advanced Robotics and Intelligent Systems Lab, University of Guelph, Guelph, Ontario, Canada - Member
- Pattern Analysis, Machine Intelligence and Robotics Lab, University of Waterloo, Waterloo, Ontario, Canada - Member

5.10.2 Other Organizations

- Kitchener-Waterloo Toastmasters, Waterloo, Ontario, Canada - Secretary/VP Education/VP Membership
- Pheonix-Toronto Toastmasters, Toronto, Ontario - Member
- Atlantis Toastmasters, Brampton, Ontario - VP Education/Founder

5.11 Reporting the Results of Research and Critical Analysis and/or the Successful Transfer of Current Technology

2012 6. Successfully transferred technologies in navigation and positioning to Defence Research and Development Canada, Atlantic through the project titled "State-of-the-Art Positioning and Navigation Methodologies and Techniques for Autonomous Underwater Vehicles"

2011 5. Successfully transferred technologies in unmanned aerial vehicles, flight simulation, perception, artificial intelligence, distributed control, virtual reality, and robotics to Defence Research and Development Canada Suffield (Suffield, AB) through the project titled "Perception and Navigation for UAVs in Support of Dismounts"

2010 4. Successfully transferred technologies in autonomous underwater vehicles, simulation, perception, artificial intelligence, distributed control, virtual reality, and robotics to Defence Research and Development Canada Atlantic (Dartmouth, NS) through the project titled "Underwater Mine Counter-Measures and Mapping Surveys with Multiple Autonomous Underwater Vehicles Using MOOS-IvP, MIRO and the Sensor Driven Approach"

2009 3. Successfully transferred technologies in autonomous underwater vehicles, simulation, perception, artificial intelligence, distributed control, virtual reality, and robotics to Defence Research and Development Canada Atlantic (Dartmouth, NS) through the project titled "Development of a Multi-Agent System Based on MIRO for Countering Underwater Threats"

2. Successfully transferred technologies in autonomous underwater vehicles, simulation, perception, artificial intelligence, distributed control, virtual reality, and robotics to Defence Research and Development Canada Atlantic (Dartmouth, NS) through the project titled "Coverage Mission Planner for Mine Countermeasure"

2007 1. Successfully transferred technologies in distributed control, virtual reality, and robotics to Shore Consulting Group (Toronto, ON) and Defence Research and Development Canada Suffield (Suffield, AB) through the project titled "Integration of Sensor Systems into Perpetual Systems for Use on Novel Small Scale Vehicle Platforms"

5.12 Research Achievements Reported by Media

2015 19. The Telegraph Journal, "Feds invest in UAV technology, partner with UNB and Moncton Flight College (Feb 11, 2015)

2014 18. The Global Intelligence, "Drones in Our Backyard" (Summer 2014)

2013 17. Naval Postgraduate School Newsletter, "Graduating Mechanical Engineering students take-off" (June 2013)

16. Daily Gleaner, "COBRA Won National Competition" (May 2013)

15. Naval Postgraduate School Newsletter, "COBRA Head to Quebec for National Competition" (May 2013)

14. Canadian Broadcasting Corporation (CBC), "Civilian Use of UAVs for Forestry" (May 13, 2013)

13. Unmanned Systems Canada, "COBRA Named First Place Winner of Canadian Student UAV Competition - Phase 1" (March 2013)

2012 12. Naval Postgraduate School Newsletter, "COBRA team meets with South Korean Defence Scientists" (March 2012)

2011 11. Daily Planet - Discovery Channel, "Flight Deck: DRDC Demonstration Day" (December 14, 2011)

10. TV news of Canadian Broadcasting Corporation (CBC), "University of New Brunswick Team COBRA" (Friday November 4, 2011, at 6PM)

9. eDaily Fredericton, "UNBF Engineering Students Receive Invitation to International Robotics Event" (Oct 2011)

8. Naval Postgraduate School Newsletter, "COBRA (COllaboration Based Robotics and Automation), University of New Brunswick" (Oct 2011)

7. Daily Gleaner, "UNB Students Headed for Robotics Conference - Young engineers have been working with military to develop unmanned UAV planes" (Oct 2011)

6. Daily Gleaner, "UNB Students Win Robotics Competition" (June 2011)

5. Unmanned Systems UK, "UNB Students Win Robotics Competition" (June 2011)

2010 4. New Brunswick Innovation Foundation, "Intelligent coordination of multiple unmanned ground vehicles and unmanned aerial vehicles"

3. Daily Gleaner, "Intelligent coordination of multiple unmanned ground vehicles and unmanned aerial vehicles"

2008 2. Daily Gleaner, "Engineers Hope Cars Will Drive Us to Work Some Day"

1. ITS America, "Engineers Hope Cars Will Drive Us to Work Some Day"

6 Academic Service

6.1 Academic Service to the University

6.1.1 Summary of Committees and Administrative Positions

Academic Year	Committee
2017-2018	Curriculum committee, safety committee, UNB teaching resources focus group
2016-2017	Curriculum committee, safety committee
2015-2016	Department Delegate for UNB Safety Orientation
2014-2015	Sabbatical leave
2013-2014	Graduate committee, robotics competition advisor
2012-2013	Coop coordinator, graduate committee, student committee, controls lab, faculty student committee, faculty coop committee
2011-2012	Coop coordinator, graduate committee, student committee, controls lab, faculty student committee, faculty coop committee
2010-2011	Student committee, controls lab, faculty student committee, robotics competition advisor
2009-2010	Graduate committee, controls lab, ECE Undergraduate Student Recruitment Committee, Dineen Lecture Series Committee
2008-2009	Graduate committee, controls lab, Dineen Lecture Series Committee
2007-2008	Graduate committee

6.1.2 Chair of Thesis Exams and PhD Qualifying Exams

6.1.3 Reviewer of Graduate Student Applications

6.1.4 Undergraduate Student Advisor

6.1.5 Proposal Reader

6.1.6 External PhD Thesis Examiner

2015 4. University of Waterloo (Iman Fadakar, PhD under Drs. Fidan and Huissoon): Spatial Formation Control

3. University of New South Wales (Michael Richard Woods, PhD under Dr. Jay katupitiya): Modelling and Perception for Autonomous Ground Vehicles in Non-uniform Terrain

2013 2. University of Waterloo (Michael Tribou, PhD under Drs. Waslander and Wang): Pose Estimation Using Non-overlapping Multicamera Clusters

2008 1. Anna University, India (PhD): Control of Piezo Actuated Systems Using Interval Methods

6.1.7 Thesis Exam Committee

2018 26. Divya Negi (MSc, supervisor: Dr. Suprio Ray): Privacy Preserving Efficient Top-k Spatial Keyword Search in Outsourced Cloud

2016 25. Yan Li (MSc, supervisor: Dr. Natalia Stakhanova): METADroid: Lightweight Android classification using meta-data

2015 24. SEYED POORIA MADANI KOCHAK (MSc, supervisor: Dr. Ali A. Ghorbani): Bursty Event Discovery from Online News Outlets

2013 23. Jonathan Meehan (MSc, supervisor: Dr. A. Simoneau) Power Consumption Characterization in CNC Machining, Mechanical Engineering, University of New Brunswick

22. Hui Tang (PhD, supervisor: Donghyun Kim): Autonomous Mobile Robot Indoor Navigation Using Multi-Sensor Integration, Geodesy and Geomatics Engineering, University of New Brunswick

2012 21. Haider Mohomad A R (MSc, supervisors: Prof. Chris Diduch, Prof. Y. Biletskiy, Prof. Liuchen Chang): Spike Removal Technology for Grid-Connected Power Converters, Electrical and Computer Engineering, University of New Brunswick

2011 20. Craig Church (MSc, supervisor: Prof. Liuchen Chang): Efficiency and Reliability Based Model for Economic Evaluation of Wind Power Systems, Electrical and Computer Engineering, University of New Brunswick

19. Zakaria Hamza (MSc, supervisor: Gerhard Dueck): Improved Ordering Of ESOP Cubes For Toffoli Networks, Electrical and Computer Engineering, University of New Brunswick

2010 18. Wael Bader (MSc, supervisors: Idris Gadoura, Peregrine Riley, Chris Diduch): Robust Control Design for Boost and Buck-boost Converters, Electrical and Computer Engineering, University of New Brunswick

17. Riming Shao (PhD, supervisor: Prof. Liuchen Chang): Power Converters for PV and Hibrid Systems, Electrical and Computer Engineering, University of New Brunswick

16. Pilar Moreno (MSc, supervisor: Jim Taylor): Electrical and Computer Engineering, University of New Brunswick

2009 15. Sean R. Perry (MSc, supervisor: Jim Taylor): Operator Interface for Autonomous Unmanned Aircraft Mission Feasibility and Control, Electrical and Computer Engineering, University of New Brunswick

14. Tenzin (MSc, supervisor: Robert Rogers, Mechanical Engineering): A Hybrid On-Line Vibration Monitoring System and Finite Element Simulation of Vertical Hydro Turbine Generators, Electrical and Computer Engineering, University of New Brunswick

2008 13. Dechen Choling (MSc, supervisor: Prof. Venkatesh): Effects of Security Constraint on Unit Commitment with Wind Generators, Electrical and Computer Engineering, University of New Brunswick

12. Ning Jiang (PhD, supervisors: Kevin Englehart and Phil Parker): Extracting Neuromuscular Primitives from the Multi-Channel Surface Electromyographic Signal, Electrical and Computer Engineering, University of New Brunswick

11. Luqian Zhu (MSc in Computer Science, supervisor: Prof. Dawn MacIsaac, Prof. Yevgen Biletskiy): Assisting Interoperability between Learning Objects and Learners in an E-Advising Scenario, Electrical and Computer Engineering, University of New Brunswick

10. Hamidreza Baghi (MSc in Computer Science, supervisor: Prof. Yevgen Biletskiy, Prof. Michael Fleming): A Combined Approach for Search of Learning Objects on the Web, Electrical and Computer Engineering, University of New Brunswick

9. Deng Zhang (MSc in Mechanical Engineering, supervisor: Dr. Rickey Dubay): Viscosity-based Models for the Plasticizing and Filling Stages in Injection Molding, Electrical and Computer Engineering, University of New Brunswick

8. Maira Omana (PhD, supervisor: Prof. Taylor): Fault Detection, Isolation and Accommodation Using the Generalized Parity Vector Technique, Electrical and Computer Engineering, University of New Brunswick

7. Tim F. Beatty (MSc in Computer Science, supervisor: Prof. Kenneth Kent) Improving an OpenMP-based Circuit Design Tool, Electrical and Computer Engineering, University of New Brunswick

6. Zitao Wang (PhD, supervisor: Prof. Liuchen Chang): Microturbine Power Converter System Utilizing a Six-Phase Permanent Magnet Synchronous Machine, Electrical and Computer Engineering, University of New Brunswick

5. Etienne Dupuis (MSc, supervisors: Prof. James Taylor, Prof. Balasubramanian Venkatesh): Power Scheduling for a Network of Distributed Generators, Electrical and Computer Engineering, University of New Brunswick

4. Atalla F. Sayda (PhD, supervisor: Prof. Jim Taylor): Intelligent Control and Asset Management of Oil and Gas Production Facilities, Electrical and Computer Engineering, University of New Brunswick

3. Yu Han (MSc, supervisor: Prof. Liuchen Chang): Short Term Wind Power Forecast Error Analysis Using Statistical Methods, Electrical and Computer Engineering, University of New Brunswick

2007 2. Ning Chang (MSc, supervisor: Prof. Biletskiy, Prof. Sharaf): A Monitoring and Identification Scheme for Power Quality Assessment, Electrical and Computer Engineering, University of New Brunswick

1. Cunyan (Angela) Tang (MSc, supervisor: Prof. Venkatesh): Nodal Reactive Power Price - An Analysis, Electrical and Computer Engineering, University of New Brunswick

6.2 Service Outside the University of Scholarly or Academic Significance

6.2.1 Community Affairs as a Representative of the University

2007 – Let's Talk Science Partnership Program, Fredericton, New Brunswick, Canada - volunteer

6.2.2 Service to Governmental Agencies and Organizations

Contributor to Industry Standards

2017 Chair of IEEE P1872.2 - IEEE Standard for Autonomous Robotics Ontology

2014 Co-author of P1872TM/D2 - IEEE Standard for Ontologies for Robotics and Automation, Committee for Standards of the IEEE Robotics and Automation Society

2012 - TC Member of IEEE Robotics and Automation Society Technical Committee on Networked Robots

2012 - TC Member of IEEE Robotics and Automation Society Technical Committee on Algorithms for Planning and Control of Robot Motion

2011 - Coordinator of Autonomous Robots Group for IEEE Standard Working Group - Ontologies for Robotics and Automation

Reviewer of Grant Applications

I have reviewed grant applications submitted by the University of Toronto, the University of British Columbia, Texas A & M University, Virginia Tech, and the University of Georgia, etc.

2017 - NSERC IRC expert panel site visit, University of Manitoba, July 2017

2017 - Reviewer of United States-Israel Binational Science Foundation applications

2017 - Reviewer of Ontario Ministry of Research and Innovation nominations

2016 - Reviewer of Canada Foundation for Innovation applications

2016 - Reviewer of Natural Sciences and Engineering Research Council of Canada (NSERC) - Collaborative Research and Development Grant

2015 - Reviewer of Swiss National Science Foundation

2015 - Reviewer of Israeli Ministry of Science, Technology and Space

2015 - Reviewer of Natural Sciences and Engineering Research Council of Canada (NSERC) - Strategic Partnership Grant

2015 - Reviewer of Canada Research Chair Nominations

2014 - Reviewer of Mitacs Elevate Post-Doctoral Fellowship proposals

2014 - Reviewer of Natural Sciences and Engineering Research Council of Canada (NSERC) CCI Program Applications

2011 - Reviewer of Natural Sciences and Engineering Research Council of Canada (NSERC) CREATE Program Applications

2013 - Reviewer of MITACS Accelerate proposals

2013 - Reviewer of Qatar National Research Fund

2011 - Reviewer of Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grants Program Applications

2011 Reviewer of Carleton University Research Excellence Fund Proposals

2010 - Reviewer of Natural Sciences and Engineering Research Council of Canada (NSERC) Strategic Project Grants Program Applications

2010 Reviewer of Department of National Defence - Technology Investment Fund Applications

Grant Selection Committee

2013 – 2014 Natural Sciences and Engineering Research Council of Canada (NSERC) Undergraduate Student Scholarships Selection Committee

2013 – 2014 Natural Sciences and Engineering Research Council of Canada (NSERC) Post Graduate Scholarships Selection Committee

2011 – 2012 Natural Sciences and Engineering Research Council of Canada (NSERC) Post Graduate Scholarships Selection Committee

2009 – 2010 Natural Sciences and Engineering Research Council of Canada (NSERC) Post Graduate Scholarships Selection Committee

2008 – 2009 Natural Sciences and Engineering Research Council of Canada (NSERC) URSA Scholarships Selection Committee

Chair of Conferences

2016 5. Session chair for Aerial Robotics, Canadian Society for Mechanical Engineering (CSME) International Congress, Kelowna, BC, Canada (June 26-29, 2016)

2011 4. Session chair for Unmanned Systems Canada Conference, Halifax, Nova Scotia, Canada (November 2011)

2009 3. Session chair for The 14th IASTED International Conference on Robotics and Applications, Cambridge, Massachusetts, USA (November 2009)

2. Session Chair for Session Soft Computing and Session Education and Software, at IEEE Electrical and Computer Engineering Conference (CCECE), St. John's, Newfoundland, Canada (May 2009)

2008 1. Session Chair for Session TE01 - Renewable Energy at IEEE Electrical and Computer Engineering Conference (CCECE), Niagara Falls, Ontario, Canada (May 6, 2008)

Organizing Activities for Conferences and Meetings

2017 30. Co-chair of autonomous robotics workshop, IEEE ROMAN, Lisbon, Portugal

2017 29. Chair of Control and Robotics Track - Canadian Conference on Electrical and Computer Engineering

2016 28. Program Committee - Canadian Conference on Computer and Robot Vision

2015 27. Chair of Control and Robotics Track - 28th Canadian Conference on Electrical and Computer Engineering

26. Program Committee - The 2014 IEEE International Conference on Robotics and Biomimetics

25. Program Committee - Canadian Conference on Computer and Robot Vision

24. Program Committee - IEEE International Conference on Mechatronics and Automation (IEEE ICMA)

23. Program Committee - IEEE International Conference on Information and Automation

2014 22. Invited Session Chair - The 10th International Conference on Intelligent Unmanned Systems, Montreal, Quebec, Canada Montreal, Quebec, Canada

21. Program Committee - The 2014 IEEE International Conference on Robotics and Biomimetics

20. Program Committee - Canadian Conference on Computer and Robot Vision

19. Program Committee - The 2014 IEEE International Conference on Information and Automation

2013 18. Program Committee - The 2013 IEEE International Conference on Information and Automation

17. Program Committee - Canadian Conference on Computer and Robot Vision

16. Program Committee - The 2013 IEEE International Conference on Robotics and Biomimetics

15. Program Committee - 2013 Australasian Conference on Robotics and Automation, Sydney, Australia

2012 14. Program Committee - Canadian Conference on Computer and Robot Vision

13. Program Committee - 2012 IEEE International Conference on Automation and Logistics

2011 12. Program Committee - 2011 The IEEE International Conference on Automation and Logistics

11. Workshop/Tutorial Chair - International Conference on Autonomous and Intelligent Systems, Vancouver, BC, Canada (AIS)

10. Program Committee - The 2011 IEEE International Conference on Mechatronics and Automation (IEEE ICMA 2011)

2010 9. Program Committee - World Congress on Intelligent Control and Automation

8. Program Co-Chair - International Conference on Autonomous and Intelligent Systems, Portugal (AIS)

7. Program Committee - The 2010 IEEE International Conference on Information and Automation

6. Program Committee - The 8th World Congress on Intelligent Control and Automation

5. International Advisory Committee - International Conference on Intelligent Design and Analysis of Engineering Products, Systems and Computation, India

2009 4. Program Committee - 2009 IEEE International Conference on Automation and Logistics, Shenyang, China

3. Program Committee - The 2009 IEEE International Conference on Information and Automation, Zhuhai/Macau, China

2. Program Committee - Sixth Canadian Conference on Computer and Robot Vision, Kelowna, British Columbia, Canada

2008 1. Program Committee - 2008 IEEE International Conference on Automation and Logistics, Qingdao, China

6.2.3 Service to Public or Private Organizations and Companies

2013 Beijing Jiao Tong University Faculty of Mechanical and Electrical Engineering public speech competition, Beijing Jiao Tong University, Beijing, China - judge for the competition

2012 UNB Engineering Design Competition, University of New Brunswick, Fredericton, New Brunswick, Canada - judge for the competition

2011 Unmanned Systems Canada Annual Conference, Halifax, Nova Scotia, Canada - judge for the student paper competition

2011 UNB Robotics Contest, University of New Brunswick, Fredericton, New Brunswick, Canada - judge for the competition

2009 UVS Canada Student UAV Design/Build/Fly Competition, CFB Gagetown, New Brunswick, Canada - judge for the competition

2009 UNB Robotics Contest, University of New Brunswick, Fredericton, New Brunswick, Canada - judge for the competition

2007 Harvest Jazz and Blues Festival, United Way of Fredericton, Fredericton, New Brunswick, Canada - volunteer

2007 Scotiabank Rat Race for United Way of Greater Toronto, Yonge Street, Bloor Street, and Bay Street, Toronto, Ontario, Canada - volunteer

2007 Becel Heart & Stroke Ride for Heart 2007, Don Valley Parkway and Gardiner Express, Toronto, Ontario, Canada - participant

2006 United Way Celebration 2006, Metro Toronto Convention Center, Toronto, Ontario, Canada - greeter

2006 The Enbridge CN Tower Stair Climb for United Way, CN Tower, Toronto, Ontario, Canada - time keeper/volunteer at the water station

2006 8th Annual United Way Blossom Ball, Canadian National Exhibition, Toronto, Ontario, Canada - volunteer

2006 Toronto's Word-On-The-Street Festival, Queen's Park, Toronto, Ontario, Canada - volunteer

2006 Hanlan's Sand Dune Planting to preserve the landforms, Toronto Bay Initiatives, Toronto Island, Toronto, Ontario, Canada - volunteer

2005	The Enbridge CN Tower Stair Climb for United Way, CN Tower, Toronto, Ontario, Canada - participant
2005	Canada Life CN Tower Climb for World Wildlife Fund, CN Tower, Toronto, Ontario, Canada - participant
2004	The 2004 Waterloo 10KM Classic Run for Charity, Waterloo, Ontario, Canada - participant
2003	YMCA Camp Kitchikewana, Midland, Ontario, Canada - volunteer for the renovation
2002	Guelph Dragon Boat Festival, Guelph, Ontario, Canada - participant and volunteer

6.2.4 Liaison Activities

My responsibilities included leading tours of the department, demonstrating projects to high school students/parents/alumni, and answering questions.

2014	World UNBound summer camp, National Mentorship Program, Fredericton, New Brunswick, Canada
2013	World UNBound summer camp, National Mentorship Program, Fredericton, New Brunswick, Canada
2012	Donor Campus Tour, University of New Brunswick, Fredericton, New Brunswick, Canada
2012	World UNBound summer camp, National Mentorship Program, Fredericton, New Brunswick, Canada
2011	World UNBound summer camp, National Mentorship Program, Fredericton, New Brunswick, Canada
2010	Bliss Carmen School STEM outreach 2010, Fredericton, New Brunswick, Canada
2009	Training for high school teachers on Professional Development Day 2009, University of New Brunswick, Fredericton, New Brunswick, Canada
2009	UNB Open House 2009, University of New Brunswick, Fredericton, New Brunswick, Canada
2008	Alumni Day 2008, University of New Brunswick, Fredericton, New Brunswick, Canada
2004	Campus Day 2004, University of Waterloo, Waterloo, Ontario, Canada
2003	Campus Day 2003, University of Waterloo, Waterloo, Ontario, Canada

References Available Upon Request