Geoffrey T. Pond, PhD, PEng

http://ca.linkedin.com/in/geoffpond

EDUCATION

Ph.D. University of New Brunswick — Fredericton, New Brunswick
Subject area: Mechanical Engineering
Degree conferred in October, 2006.

Master's in Public Administration — Kingston, Ontario
Queen's University
Degree conferred in 2016.

B.Sc.Eng. University of New Brunswick — Fredericton, New Brunswick
Subject area: Mechanical Engineering
Degree conferred in May, 2003.

Diploma in Technology Management and Entrepreneurship
University of New Brunswick — Fredericton, New Brunswick
Dr. J. Herbert Smith Centre
Diploma awarded February, 2001.

Pilot's License
Airline Training International — Toronto, Ontario
Licensed January, 2002.

Night Flying Endorsement
Capital Airways — Fredericton, New Brunswick
Licensed September, 2002.

PROFESSIONAL SHORT COURSES

Presenting Data and Information Dr. E. Tufte (Yale University)	1-Day Course 2012
Introduction to Wargaming Dr. J. Appleget (Naval Postgraduate School)	5-Day Course 2011
Developing a Statement of Work and Selection Criteria Canadian School of Public Service	3-Day Course 2010
ArcGIS Desktop II: Tools and Functionality ESRI Canada	3-Day Course 2010
Introduction to ArcGIS ESRI Canada	2-Day Course 2009
Terramechanics to Evaluate Military Vehicles Vehicle Systems Development Corporation	2.5-Day Course 2009
Multivariate Data Analysis CreaScience	5-Day Course 2008
NATO Reference Mobility Model Mobility Technology Consultants	3-Day Course 2008
Introduction to SPSS CTC Computer Training Centres	2-Day Course 2008
Fundamental and Advanced Extend Simulation Training Extend Imagine That	5-Day Course 2007
Statistical Methods for R&D CreaScience	4-Day Course 2007

ACADEMIC EXPERIENCE

Associate Professor Kingston, Ontario
Royal Military College of Canada July 2015 - Present
Department of Management and Economics

As part of the analytics group within the department of management, my research focuses on the application of quantitative methods to managerial decision-making. More specifically, the application of optimization algorithms and fuzzy logic in the context of managing fleet availability, maintenance, reliability, spares planning, and capability development.

My teaching portfolio includes Operations Management at both the undergraduate and graduate levels, in both official languages. The course is delivered in-class and supplemented by materials posted to the college's learning management system, Moodle.

Term Adjunct Kingston, Ontario
Queen's University September, 2015 – Present

I've taught three sections of COMM341: Operations Management, offered through the Smith School of Business. As part of the course delivery, I made extensive use of the school's learning management system (D2L). I have also taught foundational calculus (APSC171 & 172) and linear algebra (APSC174) to first year engineering students.

Term Adjunct Ottawa, Ontario
University of Ottawa 2016 & 2020
Telfer School of Management

During the summer term, I taught a single section of MBA5280: Operations Management. As part of the course delivery, I made extensive use of the school's learning management system (BlackBoard). The course was primarily case-based, delivered in an intensive six-week fashion.

Sessional Instructor Kingston, Ontario
Royal Military College of Canada January, 2015 – April, 2015
Department of Management and Economics

During the winter semester, I will teach Operations Planning, BAE446 – a fourth year elective course in the undergraduate degree program.

Faculty Member Kingston, Ontario
St. Lawrence College / Laurentian University September, 2008 – June 2015
School of Business

From 2008 through 2012, I taught at St. Lawrence College on a part-time basis. Commencing in August, 2012, I became a full-time faculty member at the college, teaching exclusively in the four-year business degree program. I've taught a variety of courses including, but not limited to Operations Management, Management Science, Finite Mathematics, and Business Statistics.

COURSES TAUGHT

A partial history of courses I've taught or have been assigned is given in the following table:

Academic Year	Term	Institution	Course	Level
19-20	Spring	RMC	MBA500: MBA Transition Course	G
	Spring	RMC	MBA555: Operations Management	G
	Spring	uOttawa	MBA5280: Operations Management	G
	Winter	Queen's	APSC172: Calculus II for Engineers	UG
	Winter	Queen's	APSC171: Calculus I for Engineers	UG
	Fall	Queen's	COMM341: Operations Management	UG
18-19	Winter	Queen's	APSC172J: Calculus II for Engineers	UG
	Winter	Queen's	APSC171J: Calculus I for Engineers	UG
	Winter	RMC	MBA555: Operations Management	G
	Fall	Queen's	COMM341: Operations Management	G
	Fall	RMC	AAF344: Gestion des opérations	UG
17-18	Winter	Queen's	APSC172J: Calculus II for Engineers	UG
	Winter	Queen's	APSC171J: Calculus I for Engineers	UG
	Winter	RMC	MBA507: Data Analysis	G
	Winter	RMC	MBA544: Operations Management	G
	Fall	RMC	BAE344: Operations Management	UG
	Fall	Queen's	COMM341: Operations Management	UG
16-17	Summer	RMCC	MBA555: Operations Management	G
	Summer	Queen's	APSC174J: Linear Algebra for Engrs	UG
	Winter	RMCC	MBA507: Data Analysis	G
	Winter	Queen's	APSC171J: Calculus I For Engineers	UG
	Fall	RMCC	BAE344: Operations Management	UG
15-16	Summer	uOttawa	MBA5208: Operations Management	G
	Winter	RMCC	BAE444: Supply Chain Management	UG
	Fall	RMCC	BAE344: Operations Management	UG
	Fall	Queen's	COMM341: Operations Management	UG

SUPERVISED STUDENT PROJECTS

Capt. I. Tremblay - Applied Military Science 2018-2019

Using data provided by Canada Blood Services, the student leveraged statistical models to identify an overbooking strategy that maximizes the expected blood donor levels subject to donor attributes (at an aggregate level).

2Lt . A. Afkham-Ebrahimi – RMCC UG Thesis 2017-2018

Using data provided by the Canadian Border Services Agency and UN estimates of Canada's underground narcotics market, the CBSA effectiveness at intercepting cocaine shipments being smuggled into Canada was determined using Bayesian belief networks.

Capt. M. Abdullah - Applied Military Science 2016-2017

Data mining of maintenance logs were used to complete cost-benefit analysis of preventive maintenance measures – specifically corrosion prevention sprays. The analysis leveraged ANOVA to identify difference in regional effects and the frequency of spray-coating. The results indicate that no benefit was obtained due to poor fleet management (by investing in vehicles near the end-of-life).

Capt. K. Walton - Applied Military Science 2015-2016

This research project (undertaken as part of the AMS / RMC MBA program) investigated strategic inventory management challenges facing the armed forces during overseas operations and sought solutions from technical, cultural, procedural, and management perspectives.

INDUSTRIAL EXPERIENCE

Operations Research Analyst Kingston, Ontario
DRDC-CORA September, 2006 – August, 2012

The Centre for Operational Research and Analysis (CORA) is a research centre within Defence and Research Development Canada (DRDC) specializing in modeling and simulation. Within CORA, I am worked as part of the Land Capability Development (LCD) team which focuses on current army technologies and their effectiveness in meeting both the requirements of current operations and future army expectations. My work included simulation, data mining, optimization, statistical methods, programming and other analytical tools. The majority of my work is focused on support to the Army's diverse fleet of vehicles. Highlights include:

- using improved job sequencing and resource allocation techniques, to optimize maintenance operations in support of the Army's fleet of combat vehicles; and

- using Monte Carlo simulation to identify capability deficiencies within the Army's projected future vehicle fleet. Vehicle procurement programs (valued in billions of dollars) have subsequently been modified to account for these deficiencies based on my work.

The centre appointed me to two international defence-science panels. I represented Canada on a NATO research panel studying field evaluation methods and I also represented Canada on an ABCA research panel sharing vehicle development and fleet management tools. These appointments provided me the opportunity to visit defence bases throughout NATO countries and interact with colleagues in many different countries.

Regional Procurement Engineer (Intern) Toronto, Ontario
Celestica Inc. May, 2000 - August, 2001

Celestica is a world class manufacturer of printed circuit boards ranging from those used in pagers and cell phones to internet routers and servers. As a regional procurement engineer, I worked with the purchasing group to establish sources of supply for mechanical custom parts (chassis, card guides, heat sinks, *etc.*). In addition I liaised with both customers and suppliers to understand technical issues with the manufacturing of electronic equipment.

Quality Engineer (Summer Student) Fredericton, New Brunswick
Precision Metal Works Ltd. May, 2002 - August, 2002

Precision Metal Works Ltd. is one of the top suppliers of welded vacuum chambers in the world, made from aluminum and various steels. In advance of a major contract with Atomic Energy of Canada Ltd., I was involved with detailing written procedures for the manufacturing of contracted products. Procedures for the testing of completed and procured products were also written.

BOOK CHAPTERS

Martin-Víde, C., Pond, G., and Vega-Rodríguez, M (editors), Proceedings of Theory and Practice of Natural Computing (2019) conference, *Lecture Notes in Computer Science*, Spring Publishing, 2019.

Pond, G., and G. McQuat, Chapter 17: Optimizing Fleet Staging of Air Ambulances in the Province of Ontario, *Lecture Notes in Computer Science*, Springer Publishing, 2018.

Pond, G. and Carretero, J.A., Chapter 10: Quantitative Dexterous Workspace Comparison of Serial and Parallel Planar Mechanisms, *Parallel Manipulators, New Developments*, I-Tech Education and Publishing, Vienna, Austria, 2008.

Carretero, J.A. and Pond, G., Quantitative Dexterous Workspace Comparisons, *Advances in Robot Kinematics: Mechanisms and Motion*, Springer, Dordrecht, The Netherlands, 2006.

JOURNAL PUBLICATIONS

Schobel, K. and Pond, G. Public CFO Competencies – A National Defence Case Study Examining the Balance Between Financial and Strategic Priorities, *Canadian Public Administration*, Vol. 63(2), pp. 229-246, 2020.

Tassone, J., Pond, G., and Choudhury, S. Algorithms for Optimizing Fleet Staging of Air Ambulances, *Array*, Vol. 7, 2020.

Pond, G., Abdullah, M., and Turgeon, Y. Intersection of Corrosion Prevention Strategy and Practice, *Journal of Quality in Maintenance Engineering*, Vol. 26(1), pp. 120-128, 2019.

Pond, G., Brimberg, J., Wang, Y., and Simms, W., A Comparison of Heuristics Applied to the Sensor Deployment Problem in 2D, *Defense Modeling and Simulation*, Vol. 12(3), pp. 343-352, 2015.

Pond, G. and Carretero, J.A., Dexterity Measures and Their Use in Quantitative Dexterity Comparisons, *Meccanica*, Vol. 46(1) pp. 51-64, 2011.

Pond, G.,Vehicle Availability During a Mounted Engagement, *OR Insight*, Vol 23(1) pp. 172-186, 2010.

Pond, G. and Carretero, J.A., Architecture Optimisation of Three 3-PRS Variants for Parallel Kinematic Machining, *Robotics and Computer Integrated Manufacturing*, Vol. 25 (1) pp. 64-72, 2009.

Pond, G. and Carretero, J.A., Quantitative Dexterous Workspace Comparison of Parallel Manipulators, *Mechanism and Machine Theory*, Vol. 42 (10) pp.1388-1400, 2006.

Pond, G. and Carretero, J.A., Formulating Jacobian Matrices for the Dexterity of Parallel Manipulators, *Mechanism and Machine Theory*, Vol. 41 (12) pp. 1505-1519, 2006.

REFERREED CONFERENCE PUBLICATIONS

Pond, G. and Turner, I. Regression Analysis of Historical Blood Donor Patters to Improve Clinic Scheduling. In proceedings of the 9th International Conference of Operations Research and Enterprise Systems (ICORES 2020), Valetta, Malta.

Pond, G. and Pittman, J. Forecasting and Costing of a New 105mm Modular Propellant in Support of the Royal Canadian Artillery Regiment. In proceedings of the 9th IEEE International Conference in Industrial Technology and Management (ICITM 2020), University of Oxford, UK.

Pond, G. and Shepherd, M. A Proposed Model for Optimization of Workforce Scheduling with Mentoring, Administrative Science Association of Canada (ASAC), Toronto, ON, May 26-29, 2018.

Pond, G., and Bruce, J., Exploratory Analysis of the Canadian Army Vehicle Fleet's Capability to Meet Future Requirements, in proceedings of the Administrative Science Association of Canada (ASAC), St. John's NF, June 2012.

Liang, Y., and Pond, G., An Optimal Swarm Intelligent Heuristic to Find a Route for MANet, in proceedings of the 2011 International Conference on Instrumentation, Measurement, Circuits and Systems, Hong Kong, December 2011.

Liang, Y., and Pond, G., Using Linear Optimization and Swarm Intelligent Heuristic to Find a Route for MANET, in proceedings of the 7th International Conference on Natural Computation, Shanghai, China, July 2011.

Pond, G., A Comparison of Two Metaheuristics Applied to the Sensor Deployment Problem, in proceedings of the Administrative Science Association of Canada (ASAC), Montreal QC, July 2011.

Cameron, F., and Pond, G., Military Decision Making Using Schools of Thought Analysis – A Soft Operational Research Technique With Numbers in proceedings of the: 27th International Symposium on Military Operations Research (ISMOR), Hampshire, UK, Sept 2010.

Cameron, F., and Pond, G., Applying School of Thought Analysis to Military Decision-Making, in proceedings of the: Administrative Science Association of Canada (ASAC) 2010, Regina, Saskatchewan, May 2010.

Pond, G., Vehicle Availability During a Mounted Engagement, in proceedings of: ASAC 2009, Niagara Falls, Ontario, June 2009.

Pond, G. and Carretero, J.A., Quantitatively Comparing Serial and Parallel Mechanisms in Terms of Dexterity, in proceedings of: 2nd International Workshop on Fundamental Issues and Future Research Directions for Parallel Mechanisms and Manipulators, Montpellier, France, Sept. 2008.

Pond, G. and Carretero, J.A., Dexterity Analysis of Planar Parallel Manipulators, in proceedings of: RoManSy 2006 Symposium, Warsaw, Poland, June 2006.

Carretero, J.A. and Pond, G., Workspace Comparison of the 3-PRS and 3-RPS Manipulators, in proceedings of: Advances in Robot Kinematics", Ljubljana, Slovenia, June 2006.

Pond, G. and Carretero, J.A., Dexterous Workspace Optimization of the 3-PRS Manipulator, in proceedings of: IPMM 2005, Monterey, California, USA, July 19-23, 2005.

Pond, G. and Carretero, J.A., Dexterity Analysis of the Tricept Manipulator, in proceedings of: 2005 CCToMM M^3 Symposium, Montreal, Canada, May 26-27, 2005.

Pond, G. and Carretero, J.A., Kinematic Analysis and Workspace Determination of the Inclined PRS Manipulator, in proceedings of: Romansy 2004: 15th CISM-IFToMM Symposium on Robot Design, Dynamics and Control, Montreal, Canada, June 14-18, 2004.

Pond, G. and Carretero, J.A., Singularity Analysis and Workspace Optimization of the Inclined PRS manipulator, in proceedings of: CSME-CCToMM Forum 2004, London, Ontario, Canada, June 1-4, 2004.

GOVERNMENT REPORTS

Pond, G. and Bruce, J., Vehicle Allocation Modelling in Support of Force 2013 Analysis, DRDC CORA TM 2012-192, August 2012.

Pond, G., Wang, Y., Brimberg, J., and Simms, B., A Comparison of Heuristics Applied to the Sensor Deployment Problem, DRDC CORA TM 2012-191, August 2012.

Chapman, B., Pond, G., and Woodill, G., LAV Platoon Vehicle Mix Study – Turret Versus Remote Weapon Station, DRDC CORA TM 2012-110, May 2012.

Pond, G., Probability of Detection by Visual Observation: An Integrated Survivability Monte Carlo Simulation, DRDC CORA TM 2011-142, September 2011.

Pond, G., Chapman, B., and Cazzolato, F., A Comparison Between Remote Weapon Stations, Remote Turrets, and Conventional Turrets, DRDC CORA TM 2009-064, December, 2009 (35 pages), internal.

Pond, G., Cameron, F., and Conod, S., Group Preference Ranking of Candidate Future Indirect Fire Systems, DRDC CORA TM 2008-40, July, 2008.

Pond, G., Initial Investigation of Vehicle Sampling for Inspection at CMTC, DRDC CORA TM 2007-24, July 2007.

Cazzolato, F., Roy, R., Levesque, J., and Pond, G., Probabilities of Kill in JCATS, DRDC CORA TM 2007-33, June 2007.

TECHNICAL REPORTS

Pond, G. and Holmes, H., Development of a Fleet Capacity Simulation for the ACSV Fleet. Prepared for Defence Research and Development Canada – Centre for Operational Research and Analysis, August 2019.

Hansen, E. and Pond, G., Anomaly Detection in Aircraft Flight Data. Prepared for Boeing Aerospace, August 2017.

FORMAL PRESENTATIONS

Pond, G. and Turner, I. Regression Analysis of Historical Blood Donor Patters to Improve Clinic Scheduling. 9th International Conference of Operations Research and Enterprise Systems (ICORES 2020), Valetta, Malta.

Pond, G. and Pittman, J. Forecasting and Costing of a New 105mm Modular Propellant in Support of the Royal Canadian Artillery Regiment. 9th IEEE International Conference in Industrial Technology and Management (ICITM 2020), University of Oxford, UK.

Cameron, F., and Pond, G., A President's Legacy: Kendall's Rank Correlation Methods and Finding Agreement (or Otherwise) in a Problem Solving Group, *OR55*, September 5, 2013, Exeter, UK.

Pond, G., and Bruce, J., Exploratory Analysis of the Canadian Army Vehicle Fleet's Capability to Meet Future Requirements, *ASAC Annual Conference*, 10 June 2012, St. John's, NF.

Pond, G., AAR Survey & CFTPO Results, presented to LGen Devlin (Comd CA), MGen Howard (Dep Comd CA), MGen Bowes (Comd, LFDTS), BGen Dabros (DG – Land Staff), and participants of the *After-Action Review 2012*, 1 June 2012, Kingston, ON.

Woodill, G., Chapman, B., and Pond, G., Building Enhanced Land Force Analysis & Simulation Tools (BELFAST), *Canada Netherlands Land Operational Research & Analysis Bilateral*, November, 2011, Ottawa, ON.

Cameron, F., Pond, G., Shine, D., and Appleget, J., Using Schools of Thought Analysis to Encourage a Fuller Appreciation of the Richness of Particularly Complicated Problems, *OR53,* September 6, 2011, Nottingham, UK.

Pond, G., Integrated Survivability Analysis Using a Monte Carlo Simulation, *TTCP LND TP3 Annual Meeting*, August 9, 2011, Detroit, MI.

Pond, G., A Comparison of Two Metaheuristics Applied to the Sensor Deployment Problem, *ASAC Annual Conference 2011*, July 3, 2011, Montréal, QC.

Pond, G., Facilitating Group Decision-Making Through Schools of Thought Analysis, presentation to Mr. Fred Bowden, DSTO, June 20, 2011, Kingston, ON.

Cameron, F. and Pond, G., Military Decision Making Using Schools of Thought Analysis – A Soft Operational Research Technique With Numbers, *27th Symposium on Military Operations Research*, 31 Aug 2010, Hampshire, UK.

Simms, B., Wang, Y., Pond, G., and Brimberg, J., A Sensor Deployment Problem, *CORS Annual Conference 2011*, May, 2011, St. John's, NF.

Cameron, F., and Pond, G., Applying School of Thought Analysis to Military Decision Making, *ASAC 2010*, Regina, SK, Canada.

Pond, G. and Chapman, B., Objective Performance Measurement of Simulated Ground Vehicle Situational Awareness Technologies, *McNaughton Sessions* (RMC), September, 2009.

Pond, G., Ammunition Reload Requirements of LAV Primary Weapon System Options, *International Symposium on Military OR*, September, 2009.

Chapman, B. and Pond, G., Comparison of LAV Pl Options for LAV LE, to DLCD, 7 July 2009, and COS(STRAT) 15 July 2009.

Haslip, D. and Pond, G., CIED Process Mapping, to TTCP LND AG-1.

Pond, G., Weapon Systems Option Analysis for the Future Medium Weight Vehicle Capability, to TTCP LND TP3, April, 2009.

Chapman, B. and Pond, G., RWS / Turret Experimentation Through Simulation – Project Update Brief, to DLCD, 13 March, 2009.

Pond, G., Group Decision Support to the Future Indirect Fire Capability Study, *DRDC CORA Symposium*, Ottawa, 9-10 February, 2009.

Pond, G., Chapman, B., and Cazzolato, F., Turret / RWS: A General Performance Comparison, brief to (A) DLR & DLAVPM 13 Dec 2008; (B) BGen. Tremblay, COS(STRAT) – 5 Dec 2008; and (C) Army Capability Development Board – 9 Dec 2008.

Pond, G. and Chapman, B., Canada's Experience w/ IEDs in Afghanistan, TTCP LND AG-1/AG-2 meeting, 14 Nov 2008.

Pond, G., RWS/Turret Technology Survey for LAV LE, back-brief to (A) BGen. Tremblay, COS(STRAT), 13 August, 2008, and (B) DAD / DLCD senior officers, 15 Oct 2008.

Pond, G., A Framework for Modelling Blast Effects on Buildings, Vehicles and Personnel, visit of faculty members from the US Air Force Institute of Technology, 20 June, 2007.

Pond, G., Armour Penetration Calculation for JCATS and Target Characterization, visit of New Zealand and Australian defence scientists, 23 March, 2007.

Pond, G., Mathematical Software for OR: Maple 10 and Matlab 7, Short Course on OR, Cornwall, ON, 10 January, 2007.

Pond, G., A Career in Defence Operational Research and Analysis, Recruitment Seminar, Queen's University, Nov. 22, 2006.

Pond, G., Dexterity and Workspace Characteristics of Complex Degree-of-Freedom Parallel Manipulators, External PhD defence, University of New Brunswick, Aug. 24, 2006, Fredericton, NB, Canada.

Pond, G., Dexterity and Workspace Characteristics of Complex Degree-of-Freedom Parallel Manipulators, Internal PhD defence, University of New Brunswick, July 6, 2006, Fredericton, NB, Canada.

Pond, G., Differential Evolution: a Global Optimisation Strategy, Guest lecture, University of New Brunswick, March 31, 2006, Fredericton, NB, Canada.

Pond, G. and Carretero, J., Dexterous Workspace Optimization of the 3-PRS Manipulator, Proceedings the *2005 Conference on Intelligent Processing and Manufacturing of Materials* (IPMM 2005), July 19-23, 2005, Monterey, California, USA.

Pond, G. and Carretero, J., Dexterity Analysis of the Tricept Manipulator, Proceedings *2005 CCToMM Symposium on Mechanisms, Machines and Mechatronics*, May 26-27, 2005, Saint-Hubert, Quebec, Canada.

Pond, G. and Carretero, J., Singularity Analysis and Workspace Optimization of the Inclined PRS Manipulator, Proceedings of the *2004 CCToMM M^3 Symposium*, 2004 CSME Forum, June 1-4, 2004, London, Ontario, Canada.

Pond, G. and Carretero, J., Kinematic Analysis and Workspace Determination of the Inclined PRS Parallel Manipulator, Proceedings of the *2004 RoManSy, 15th CISM-IFToMM Symposium on Robot Design, Dynamics and Control*, June 14-18, 2004, Montreal, Québec, Canada.

ACADEMIC SERVICE

RMC Department of Management
Department Head (2018-9)
Program Chair (2016-9)
MBA Committee (2015-9)

Graduate Examination Committees

PhD Examination Committees

A Unified Approach to Multi-Server Bulk-Arrival Queues Using Roots - J. Kim (2018)

A Direct Method of Solving (Linear or Nonlinear, Continuous or Discrete) Multicriteria Optimization Problems - Y. Wang (2018)

Master's Examination Committees

New and Extended Results in Renewal and Queuing Theories - J. Kim (2016)

Journal Submission Reviews

Reviewer for the following academic journals:

- *Journal of Mechanical Design*
- *Robotica*
- *Robotics and Computer Integrated Manufacturing*
- *Interfaces*
- *OR Insight*
- *Simulation: Transactions of the Society for Modeling and Simulation*
- *Journal of Quality in Maintenance and Engineering*

Conference Submission Reviews

- Administrative Science Association of Canada (ASAC 2018), Toronto
- Administrative Science Association of Canada (ASAC 2013), Calgary
- Administrative Science Association of Canada (ASAC 2012), St. John's NF
- Administrative Science Association of Canada (ASAC 2011), Montreal
- Administrative Science Association of Canada (ASAC 2010), Regina, SK
- 10th World Congress on Intelligent Control and Automation, Beijing, China, 2012
- 8th World Congress on Intelligent Control and Automation, Jinan, China, 2010
- IEEE International Conference on Automation and Logistics (ICAL 2009), Shenyang, China
- Administrative Science Association of Canada (ASAC 2009), Niagara Falls
- Military Modeling and Simulation Symposium (MMS 2009), San Diego, CA.
- 2005 CCToMM M^3 Symposium, Montreal
- CSME-CCToMM Forum 2004, London, Ontario

Divisional chair for the Management Science Division of ASAC 2013, Calgary, AB.

Program chair for the Management Science Division of ASAC 2012, St. John's, NF.

Coordinator of academic reviews for the Management Science Division of ASAC 2011, Montreal, QC.

Reviewer of publications internal to DRDC-CORA.

DOCTORAL THESIS

Modern manufacturing lines often leverage the improved capabilities of sophisticated robotic mechanisms (e.g., robot welding on an automotive manufacturing line). However, optimizing the architecture of these robots and manufacturing lines to make the best use of these significant capital investments has historically been problematic due largely to the mathematical complexity of the resulting optimization problem.

Meta-heuristics are employed in my research to optimize the manipulator's architecture to provide the best possible manipulator stiffness (resulting in greater accuracy) – or high end effector velocities. Consequently, manufacturing lines leveraging automated procedures in complex dimensions may be optimized for either accuracy of their work, or increased output. However, as demonstrated through singular value decomposition of the Jacobian matrix, the two objectives (increased output and improved accuracy) are mutually exclusive, meaning that one comes at the expense of the other.

The optimization algorithms included in the research are Genetic Algorithms and Differential Evolution algorithms. The research demonstrates that for optimization of the resulting continuous space problem, Differential Evolution provided superior objective function values (i.e., it found better solutions) and did so in less time in comparison to the Genetic Algorithm.

RESEARCH INTERESTS

Optimisation:

- the application of global meta-heuristics to business and military problems. More specifically, Differential Evolution (DE), Genetic Algorithms (GA), Ant Colony, Particle Swarm, and Tabu Search algorithms.
- Hybrid algorithms which include a local search strategy (i.e., linear programming, vertex swap algorithm, or greedy algorithms), within a global meta-heuristic.
- Fuzzy logic and fuzzy optimization
- Supervised and Unsupervised Learning

Fleet Management:

- Applications of aforementioned optimization strategies to
    - Fleet staging
    - Fleet composition
    - Maintenance planning
    - Spare parts inventories

PROFESSIONAL MEMBERSHIP

Professional Engineers Ontario (*P.Eng.*)

Administrative Sciences Association of Canada

Canadian Operational Research Society

AWARDS

2017	(Nomination) Teaching Excellence Award (RMC)
2011	Best Presentation Award UK OR Society
2010	Science and Technology Excellence Award Defence Research and Development Canada
2010	Best Overall Paper International Symposium of Military Operations Research
2010	Best Paper (Honourable Mention) Administrative Sciences Association of Canada
2007	Nominated by UNB: Doctoral Prize (23 submissions made nationally) NSERC: Engineering and Computer Science
2005	Advanced Studies Scholarship (Doctoral) Association of Professional Engineers and Geoscientists of New Brunswick
2004	Graduate Bursary University of New Brunswick
2004	Youth Delegate Award International Federation for the Promotion of Mechanism and Machine Science