CENTRE FOR INTELLIGENT MACHINES (CIM)

Centre de recherche sur les machines intelligentes
www.cim.mcgill.ca

Annual Report 2015

Director
Professor James J. Clark

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Summary

The McGill Centre for Intelligent Machines (CIM) is a multi-disciplinary, inter-departmental, inter-faculty research group formed in 1985 to provide an enriched mentoring and training environment for graduate students studying in the field of robotics and intelligent systems.

For almost 3 decades, CIM has been a pioneering force in cross-disciplinary research. The Centre is primarily located in contiguous space where labs and student offices are shared. CIM's membership and students have been universally recognized over the years for their highest standards of excellence – exceptional scientific achievements and outstanding contributions to society and industry.

The Centre is comprised of 21 full members from both the Faculties of Engineering and Science -- the Department of Electrical and Computer Engineering, Department of Mechanical Engineering and the School of Computer Science. CIM also has associate members representing a diversity of research collaborations, such as within the Faculty of Medicine --the Royal Victoria Hospital and the Montreal Neurological Institute.

The Centre is home to a diverse population of researchers: in addition to the 21 full members, at the end of 2015 the centre boasted a complement in excess of 200 graduate students, post-docs and undergraduate students, as well as visiting scholars, research assistants and associates from various disciplines.

Ph.D	Masters (Thesis)	Masters (non-thesis)	U/Grads	Post-Docs	**Total**
80	70.5	13	92	12.5	**268**

*Note: .5 indicates co-supervision of a student

The 2015 calendar year brought a number of noteworthy events for the Centre. These include:

- Addition of a new full member, James Richard Forbes in Mechanical Engineering and three new associate members, Roussos Dimitrakopoulos in Mining Engineering, David Meger in Computer Science and Viacheslav Adamchuk in Bioresource Engineering.
- Awarding of a number of significant honours
- CIM researchers were very productive, having presented their research results and developments in more than 200 publications in major conferences and journals.

Section I – Membership

Full Members

Angeles, Jorge	James McGill Professor, Mechanical Engineering
Arbel, Tal	Associate Professor, Electrical and Computer Engineering
Boulet, Benoit	Associate Professor, William Dawson Scholar, ECE
Caines, Peter	MacDonald Professor, Electrical and Computer Engineering
Clark, James	Professor, Electrical and Computer Engineering
Cooperstock, Jeremy	Associate Professor, Electrical and Computer Engineering
Cortelezzi, Luca	Associate Professor, Mechanical Engineering
Dudek, Gregory	James McGill Professor, Computer Science
Ferrie, Frank	Professor, Electrical and Computer Engineering
Forbes, James	Assistant Professor, Mechanical Engineering
Kovecses, Jozsef	Associate Professor, Mechanical Engineering
Kry, Paul	Associate Professor, Computer Science
Langer, Michael	Associate Professor, Computer Science
Levine, Martin	Professor, Electrical and Computer Engineering
Mahajan, Aditya	Assistant Professor, Electrical and Computer Engineering
Michalska, Hannah	Associate Professor, Electrical and Computer Engineering
Nahon, Meyer	Professor, Mechanical Engineering
Pineau, Joelle	Associate Professor, Computer Science
Sharf, Inna	Professor, Mechanical Engineering
Siddiqi, Kaleem	Professor, Computer Science
Zsombor-Murray, Paul	Associate Professor, Mechanical Engineering

Associate Members

Adamchuk, Viacheslav	Associate Professor, Bioresource Engineering, McGill University
Cecere, Renzo	Associate Professor, Cardiac Surgery (RVH), McGill University
Cheung, Jackie Chi Kit	Assistant Professor, School of Computer Science, McGill University
Collins, Louis	Professor, Neurology & Neurosurgery/Biomedical Engineering
Dimitrakopoulos, Roussos	Professor, Mining Engineering, McGill University
Hamann, Marco	Professor, Math/Informatics, Dresden University of Applied Sciences
Hayward, Vincent	Professor, ISIR, Université Pierre et Marie Curie, Paris France
Husty, Manfred	Professor, Geometry and CAD, University of Innsbruck, Austria
Liu, Xue	Associate Professor, Computer Science, McGill University
Meger, David	Assistant Professor, Computer Science, McGill University
Misra, Arun	Professor, Mechanical Engineering, McGill University
Mongrain, Rosaire	Associate Professor, Mechanical Engineering, McGill University
Musallam, Sam	Associate Professor, CRC chair in Bioengineering, ECE, McGill University
Panangaden, Prakash	Professor, Computer Science, McGill University
Paranjape, Aditya	Assistant Professor, Mechanical Engineering, McGill University
Pike, Bruce	Professor, Faculty of Medicine, University of Calgary
Precup, Doina	Associate Professor, Computer Science, McGill University

New Members

James Richard Forbes (associate to full)

In October 2015, Professor Forbes was promoted to full member from his previous position as associate upon his return to McGill from the University of Michigan. James received his M.A.Sc. and Ph.D. degrees in Aerospace Science and Engineering from the University of Toronto Institute for Aerospace Studies (UTIAS) in 2008 and 2011, respectively. He was awarded the prestigious G.N. Patterson Award for the most outstanding Ph.D. thesis in 2011. He joined McGill as an assistant professor in 2011 before moving to the University of Michigan in 2013. The focus of his research is the dynamics and control of aerospace systems including large flexible space structures, spacecraft, unconventional Mars rovers, and high-altitude balloons.

Roussos Dimitrakopoulos

Professor Dimitrakopoulos became an associate member of CIM in May 2015. He holds a Canada Research Chair in sustainable mineral resource development and optimization under uncertainty. His research interests include developing new modelling technologies for mine planning, design and production scheduling founded upon stochastic modelling, and optimization. He is the director of the COSMO Stochastic Mine Planning Laboratory, which collaborates with many international mining companies.

David Meger

Professor Meger is the newest associate member. Before this appointment as an assistant professor in the School of Computer Science he was already involved with CIM as a postdoctoral researcher in the Mobile Robotics Lab under the supervision of Prof. Greg Dudek. His research interests include computer vision, machine learning and robotics, and his latest project was the development of adaptive gait control for swimming robots such as AQUA. This work was a best paper finalist at ICRA 2015.

Viacheslav Adamchuk

A professor in the department of Bioresource Engineering at McGill's Macdonald Campus, Professor Adamchuk became an associate member in May 2015. Originally from Ukraine, he received his MS and Ph.D. in Agricultural and Biological Engineering from Purdue University in Indiana. He began teaching at the University of Nebraska-Lincoln and ten years later he came to McGill, while remaining an adjunct there. His research focuses on the development of soil sensing technology to enhance the economic and environmental benefits of precision agriculture.

Visitors

The following researchers were long-term (one month or longer) visitors to CIM, working in the labs of one or more CIM members:

Tadasuke Furuya	Japan, Tokyo University of Marine Science & Technology – hosted by Frank Ferrie
Fanxiang Zeng	Beijing University of Posts and Telecommunications, China – hosted by Martin Levine
Laszlo Gogh	hosted by Jozsef Kovecses
Balint Mohacsi	hosted by Jozsef Kovecses
Pierre Ablin	École polytechnique Palaiseau - hosted by Kaleem Siddiqi
Qiong Zhang	Laval University - hosted by Frank Ferrie
Karim Koreitem	University of Toronto - hosted by Gregory Dudek
Yanzhe Yang	Mitacs Globalink research intern - hosted by Jeremy Cooperstock
Nicola Gallo	Politecnico di Torino, Italy - hosted by Jeremy Cooperstock
David Corinaldi	University of Le Marche, Italy - hosted by Jorge Angeles
Toby Howison	Bristol University, UK - hosted by Jorge Angeles
Yi Xie	Zhejiang University, China - hosted by Martin Levine
Cameron Knox	Australia - hosted by Jorge Angeles
Yonjun Pan	Spain - hosted by Jozsef Kovecses
Yanxiang Fan	National University of Defense Technology, China - hosted by Martin Levine
Audrey Durand	Université Laval – Hosted by Joelle Pineau
Lorinc Marton	Sapientia University, Transylvania – hosted by Jozsef Kovecses
Xian Liu	University of Electronic Science and Technology, China – hosted by Jeremy Cooperstock

Centre Board Members

On December 8, 2015 the Centre board held its first meeting in many years. The attendees of the board meeting were:
Professor James Clark (Centre Director and Chair of the Board)
Professor James Nicell (Dean of the Faculty of Engineering)
Professor Bruce Lennox (Dean of the Faculty of Science)
Professor Doina Precup (Associate Dean, Research, Faculty of Science – VP Research delegate)
Professor Greg Dudek (CIM member)
Professor Frank Ferrie (CIM member)
Dr. Pierre Breton (XL-Cap, external member)
Mr. Jason Taylor (CIM student representative)

Section II – Awards

Professor **Kaleem Siddiqi** was awarded the Fessenden Professorship to support his project on heart wall myofiber modeling by the Faculty of Science.

Professor **Joelle Pineau** was named a William Dawson Scholar in 2015. She was also awarded the Principal's Prize for Outstanding Emerging Researchers at McGill University in 2015.

Professor **Joelle Pineau** was awarded the 2014-15 Tomlinson award in the associate professor category, while Professor **Paul Kry** won the 2013-14 Tomlinson assistant professor award. Both are professors in the School of Computer Science and full members of CIM. The Tomlinson Scientist awards were established in honour of the interdisciplinary collaborators Ernest Rutherford (Nobel Prize in Chemistry 1908) and Frederick Soddy (Nobel Prize in Chemistry 1921), through the generous endowment of a visionary philanthropist, Dr. Richard Tomlinson. The intention of the award is to recognize and support excellence, to recognize and support scientific leadership, particularly the collaborative leadership of a research agenda, and to provide seed money for emerging research directions, including those of an interdisciplinary nature.

Emmanuel Piuze has been awarded the CIPPRS Doctoral Dissertation Award 2015 Honourable Mention for his thesis entitled "The geometry of cardiac myofibers". He is supervised by CIM member Professor **Kaleem Siddiqi**. The Canadian Image Processing and Pattern Recognition Society (CIPPRS) Doctoral Dissertation Award is given annually to the top Ph.D. thesis in the areas covered by the Conference on Computer and Robot Vision (CRV).

On October 5, 2015, the Faculty of Engineering hosted the third annual McGill Engineering Research Showcase. Over 45 graduate students, including several from CIM, presented their work to the McGill community and industry representatives. Five thematic areas were highlighted, demonstrating the breadth of research in the faculty. **Colin Gallacher**, a master's student under the supervision of Prof. **Jozsef Kovecses**, won the best poster award in the Information and Communications Technology research area for Haplet: An Open-Source, Portable and Affordable Haptic Device for Democratizing Haptic Technologies.

Arash Mohtat and **Colin Gallagher**, graduate students under the supervision of Prof. **Jozsef Kovecses** tied for first place in the Mathworks Simulink Design Challange for their Haptic Billiards Game.

Professor **Aditya Mahajan** was the recipient of the George Axelby Outstanding Paper Award awarded by the Control Systems Society, December 2015. This prize is awarded to papers published in the IEEE Transactions on Automatic Control on the basis of originality, potential impact on the theoretical foundations of control, importance and practical significance in applications, and clarity.

Professor **Jeremy Cooperstock** was named the inaugural Farnell Teaching Scholar, awarded by the Faculty of Engineering of McGill on August 4, 2015. This award supports Professor Cooperstock's work in adopting active- and peer-learning approaches into his Human-Computer Interaction and Artificial Intelligence courses.

Master's student **Naoto Hieda**, under the supervision of Prof. **Jeremy Cooperstock**, won a weekend project award at Laval Virtual for his project SharedFace2. The International Conference and Exhibition of Virtual Technologies and Uses: Laval Virtual ReVolution was held in Laval, France, in April 2015.

Professor **Tal Arbel** won the IEEE 2015 Conference on Computer Vision and Pattern Recognition (CVPR) Outstanding Reviewer Award, given to best reviewers of papers submitted to the 2015 CVPR Conference (given to approximately 70 out of 1200 reviewers). The prize was awarded by the organizers of the conference, Boston, U.S.A, June 2015.
(http://www.pamitc.org/cvpr15/awards.php)

Professor **Arbel** was also the recipient of the second place award for the Longitudinal MS Lesion Segmentation Challenge, held in conjunction with the 2015 International Symposium on Biomedical Imaging (ISBI). This was awarded by the organizers of the workshop (from the National Institute of Health, U.S.A.) at the ISBI conference, New York, U.S.A., April 2015.

Prof. **Arbel** also received a best paper award, with I. J. Gerard, M. Kersten-Oertel, S. Drouin, J. A. Hall, K. Petrecca, **D. De Nigris***, and D. L. Collins. Their paper entitled "Improving Patient Specific Neurosurgical Models with Intraoperative Ultrasound and Augmented Reality Visualizations in a Neuronavigation Environment", was presented in the proceedings of the 4th MICCAI Workshop on Clinical Image-based Procedures: Translational Research in Medical Imaging (CLIP 2015) held in conjunction with the 18th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI '15), Munich, Germany, Oct. 5, 2015.

The Canadian Image Processing and Pattern Recognition Society (CIPPRS) Doctoral Dissertation Award was awarded to **Zahra Karim-Aghaloo**, a doctoral student under Prof. **Arbel**'s supervision for her thesis entitled: "Hierarchical Adaptive Voxel and Textural Conditional Random Field for Enhanced Pathology Segmentation". This was awarded at the Conference of Computer and Robot Vision, June 2015.

A workshop entitled "Mathematical Cybernetics: Hybrid, Stochastic and Decentralized Systems. An International Workshop in Honour of Professor **Peter E. Caines**" was held at Carleton University, Ottawa. Supported by Carleton University and NSERC.

Professor **Jorge Angeles** was the recipient of the ASME Machine Design Award, August 4, 2015. The Machine Design Award recognizes eminent achievement or distinguished service in the field of machine design which is considered to include application, research, development, or

teaching of machine design. The Machine Design Division (now Design Engineering Division) established the award in 1958.
Prof. **Angeles** also won the Canadian Congress of Applied Mechanics' Applied Mechanics Award on June 4, 2015.
Prof. **Angeles** and his student **Jérémie Léger** were the recipients of "The Best Theoretical Paper" Award at the TrC-IFToMM Symposium on Theory of Machines and Mechanisms in Izmir, Turkey, on June 14-17 for their paper entitled "A Redundancy-resolution Algorithm for Five-degree-of-freedom Tasks via Sequential Quadratic Programming."

Professor **James Forbes** was nominated for the "Golden Apple Award" at the University of Michigan. The Golden Apple Award honors those teachers who consistently teach each lecture as if it were their last, and strive not only to disseminate knowledge but to inspire and engage students in its pursuit.

Professor **Forbes** won a best paper award at the American Control Conference in Chicago, IL for his work with R. J. Caverly entitled "Maintaining Positive Cable Tensions during Operation of a Single Degree of Freedom Flexible Cable-Driven Parallel Manipulator."

The mobile robotics group presented a paper that was a finalist for the Best Paper Award at ICRA 2015 in Seattle, WA. The paper was entitled "Learning Legged Swimming Gaits from Experience" and was written by **Dave Meger, Juan Camilo Gamboa Higuera, Anqi Xu, Philippe Giguere and Gregory Dudek**.

Section III – Research Funding

The research carried out in the Centre is funded from a wide range of sources, including the Governments of Canada and Quebec (primarily through NSERC Discovery and Partnership grants and FRQNT grants) as well as industry (through research contracts and contributions to governmental partnership programs). These programs are too numerous to list individually. However, there are some large programs that affect a significant proportion of the researchers in the Centre, and we provide some details on these in the following section.

REPARTI

Regroupement pour l'étude des environnements partagés intelligents répartis

Regroupement REPARTI is a $4M inter-institutional, interdisciplinary collaborative venture comprised of 8 Quebec institutions, 35 members and over 300 students. The McGill node of REPARTI is represented by 13 members from the McGill Centre for Intelligent Machines (CIM). The members of the McGill node collaborate in grants and contracts valued in excess of $5M annually. This FRQNT regroupement is a primary funding source for the McGill Centre for Intelligent machines (CIM).

The institutions participating in REPARTI are: Université Laval (host institution), McGill University, Université de Sherbrooke, Ēcole Polytechnique, Université de Montréal, Université du Québec à Chicoutimi and École de technologie supérieure (ÉTS).

Supported by the Quebec government's Fonds de recherche Nature et technologies (FQRNT), this regroupement stratégique builds on some unique precedents:

(1) The historical and concrete partnership that developed over the past 25 years between prominent researchers in U. Laval and McGill (CIM) as a result of the NSERC National Centres of Excellence program, the interuniversity-industrial consortium IRIS-Precarn, and the FQRNT Réseau QERRAnet.

(2) The long and productive relationship established between the McGill Centre for Intelligent Machines (CIM) and the Quebec government through the former FCAR Centre de recherche programme.

The regroupement REPARTI was successfully renewed in 2013 for 6 years until 2019.

CREATE-MIA

NSERC Collaborative Research and Training Experience in Medical Image Analysis

The CREATE-MIA, funded by NSERC, was started in 2012, with the aim of training students for research careers in both academia and industry. The program employs a collaborative and multi-faceted approach including:

- experts from academia, industry and/or medicine to oversee a trainee's progress throughout the program
- a selection of advanced courses from different academic departments to provide a comprehensive background in medical imaging
- internships with our industrial partners on company premises to give first-hand real-world industry experience
- participation in events such as seminars, workshops, and a summer school to broaden and enrich their knowledge-base
- participation in SKILLSETS training seminars offered by McGill University to gain professional skills that will be useful when entering the workforce or starting businesses of their own.

The institutions participating in CREATE-MIA are: McGill University (host institution), Université de Sherbrooke, and École de technologie supérieure (ÉTS). Currently, the program supports 16 graduate students, 4 of whom are currently supervised by CIM members.

The director of the CREATE-MIA program is CIM member **Kaleem Siddiqi**. The program faculty includes CIM member **Tal Arbel**, CIM associate members **Louis Collins, Bruce Pike**, and CIM alumni **Catherine Laporte** (now assistant professor at ÉTS) and **Maxime Descoteaux** (now an assistant professor at Universite de Sherbrooke).

APC

Automotive Partnership Canada

CIM is home to a three-year, $4.7 million project, funded by the NSERC Automotive Partnership Canada program. The goal of this project is to combine electric motor technology obtained from Quebec-based TM4 Electrodynamic Systems with a multi-speed drive train from Ontario-based Linamar Corporation. This project aims to improve electric vehicle efficiency, speed and driving range without increasing drains on batteries. The research will reduce costs of electric vehicle engines through the development of multi-speed drivetrains that are smaller and lighter than the single-speed drivetrains currently in use.

The McGill APC project was announced in February 2013, and is led by CIM member Professor **Benoit Boulet**.

NCFRN

NSERC Canadian Field Robotics Network

The NCFRN is a Canada-wide network spanning 8 universities and 14 partner organizations. The network brings together academic, government, and industrial researchers in the area of field robotics, to develop the science and technologies to eventually allow teams of heterogeneous robots (on land, in the air, on the surface of or under water) to work collaboratively in outdoor environments, and to communicate critical information to humans who operate them or use them.

The NCFRN supports the work of 11 researchers from 8 different universities. It connects the academic participants with 10 industrial partners and 4 government agencies to leverage their complementary experience and capabilities. The network investigates fundamental issues in robotics science as well as develops technologies developed addressing particularly Canadian problems such as environmental monitoring and maintenance, border surveillance, cleanup of environmental disasters, and assisting and caring for senior citizens.

The NCFRN primarily provides direct support for students, thereby training highly qualified new researchers, engineers and technicians able to work in robotics-related industry.

The NCFRN network management is hosted by McGill and CIM, with CIM member **Greg Dudek** serving as scientific director. CIM member **Joelle Pineau** serves as the leader of the thematic area “Human”. CIM member **Inna Sharf** is also a research member of the NCFRN.

Section IV – Events

Second Annual Student Research Showcase

On October 6th, 2016 the second annual Student Research Showcase was held in the Zames seminar room. It featured short one-slide presentations in the areas of Robotics, Systems and Control, Human-Computer Interaction, Machine Vision and Medical Image Analysis. Over fifty students participated in the event, and several professors and other students attended as spectators. It was a great opportunity for everyone to learn about the research in other CIM labs and network. This showcase built on the success of last year's inaugural event and is expected to continue to foster ties in the department for years to come.

Forest Machine Technology Conference Tour

CIM hosted a tour on April 23, 2015 for participants of the Robotics in the Forest Workshop, a local conference organized by FPInnovations. Several labs opened their doors and presented demos to welcome the thirty attendees, including artificial perception, applied dynamics, mobile robotics, reasoning and learning, robotic mechanical systems, and aerospace mechatronics. There was also a demonstration of a simulator produced by CM Labs, an industrial collaborator with CIM. The workshop covered topics as diverse as the technologies used in mines, robotics in manufacturing plants and in the field, aerospace, remote operations, self-learning systems, automation of repetitive tasks and new high-performance sensors now available on the market, and usable, in particular, by overhead or land drones. Many of these subjects are investigated in the labs at CIM so it was a valuable opportunity for students and researchers to interact with industry members from all over the world and learn from each other.

CIM Team Building Event

To mark the end of the semester, the students and professors at the Centre for Intelligent Machines convened in the Zames room for an afternoon of socializing and team building. The event was well attended and participants enjoyed a quiz game that tested their knowledge of CIM history and the field of intelligent systems.

Informal Systems Seminars

Organized by Profs. Aditya Mahajan and Peter Caines every Friday, this seminar series brings together researchers from many universities. Speakers come from all over the world to present on various topics of importance in the field of systems and control, and these events are well attended by faculty and grad students alike.

Seminars at CIM

Matt Smith	TandemLaunch, Canada
Jerome Le Ny	Ecole Polytechnique de Montréal, Canada
Mihaela Pop	University of Toronto, Canada
Nicola Pedrocchi	National Council of Research, Italy
Farzin Taringoo	University of Melbourne, Australia
Alexis Lussier-Desbiens	University of Sherbrooke, Canada
Andrew D. Lewis	Queen's University, Canada
Mehmet Dogar	MIT CSAIL, USA
Yi Ouyang	University of Michigan, Ann Arbor, USA
Yi Ouyang	University of Michigan, Ann Arbor, USA
Tucker Hermans	Technische Universität Darmstadt, Germany
Yogesh Girdhar	Woods Hole Oceanographic Institution, USA
Yang Cai	McGill University, Canada
Paul Hebert	NASA Jet Propulsion Laboratory, USA
Anca Dragan	Carnegie Mellon University, USA
Vasumathi Raman	California Institute of Technology, USA
Ba Tuong Vo	Curtin University, Perth , Australia
Dave Meger	McGill University, Canada
Nevroz Sen	McGill University, Canada
Hugh Liu	University of Toronto, Canada
J.N. Reddy	Texas A&M University, USA
Olivier Grisel	Scikit-Learn
Frédéric Lesage	École Polytechnique Montréal, Canada
Jon Sporring	University of Copenhagen, Denmark
Luc Florack	Eindhoven University of Technology, Netherlands
Emmanuel Piuze-Phaneuf	McGill University and University of Copenhagen
Tony Jebara	Columbia University, USA
Leila Pishdad	McGill University, Canada
Ali Pakniyat	McGill University, Canada
Giorgio Figliolini	University of Cassino and Southern Lazio, Italy
Frank Rudzicz	Thotra Inc, Canada
Laurent D. Cohen	Université Paris Dauphine, France
Jalal Arabneydi	McGill University, Canada
Lynette Jones	Massachusetts Institute of Technology, USA
Jia Yuan Yu	Concordia Institute of Information Systems Engineering, Canada
Sindri Magnússon	KTH Royal Institute of Technology, Sweden
Jean-Francois Lalonde	Universite Laval, Canada
Carlo Fischione	KTH Royal Institute of Technology, Sweden
Doina Precup	McGill University, Canada
Shuang Gao	McGill University, Canada

Aditya Mahajan, Di Wu, Mohamed K. Helwa	McGill University, Canada
Dena Firoozi	McGill University, Canada
Ali Pakniyat	McGill University, Canada
Roland Malhame	Ecole Polytechnique de Montreal, Canada
Pierre Jordaan	Novartis Pharma, Basel, Switzerland
Brent Gillespie	University of Michigan, USA
Mohamed K. Helwa	McGill University, Canada
Nevroz Sen	McGill University, Canada

Section V – Plans for the Coming Year

Some activities that are planned for 2016-17 include:

- Development and submission of a major CFI infrastructure grant ($23M) to support research into autonomous vehicles, field robotics and electric cars. The proposed plan is to construct and equip space in the McConnell courtyard permitting housing and testing of ground vehicles as well as space for flight testing unmanned aerial vehicles.
- Launching of the industrial affiliate program. In collaboration with the Faculty of Engineering, identifying companies with interests related to the Centre activities to become inaugural affiliate members.
- Creating a “Case for Support” in collaboration with the Faculty of Engineering Development and Alumni Relations office to be shared with potential donors to the Centre. Discuss with the Faculty Development Office donation opportunities related to the proposed CFI infrastructure.

Section VI – Industrial Partners

Many of the centre's research activities are carried out in collaboration with industrial partners. A (partial) list of these partners is given in the following table.

- Alta Precision Inc.
- Astrium SAS
- Bombardier Inc.
- CAE
- Canadian Space Agency
- Cirque du Soleil
- Clear Path Robotics
- CMLabs
- CMLabs Simulations
- ConsumerReport
- Crosswing
- Disney Research Zurich
- Dreco Energy Services
- Elekta
- Google
- General Motors Canada
- Genetec
- Hewlett-Packard
- HoloLabs Studio Inc.
- Imeka
- Immersion
- Independent Robotics
- Infolytica
- Intelerad
- InterDigital Canada
- IREQ - HydroQuebec
- Kinsol
- Linamar
- Macdonald Dettwiler & Associates
- MDA
- Mokko Studios
- MT4
- National Oilwell Varco
- Neptec
- NeuroRX
- Nokia
- NSPRO
- Nuance
- Object Research Systems
- Open Source Robotics Foundation
- ORS
- Placage Unique Inc.
- Pleaides Inc.
- Pratt and Whitney Canada
- DRDC Suffield
- Revol Technologies Ltd.
- Rogue Research
- Synaptive Medical
- TandemLaunch Inc.
- Technospin Inc.
- Telemar
- Thermo FS
- TM4
- True Positive
- Vecna
- Wellbore Technologies

Section VII – Publications

(Note: publications listed are those that appeared during the calendar year of 2015. Some publications appear twice due to collaboration between Centre members)

Angeles, Jorge

Articles in refereed publications

1. Ghotbi, B., González, F., Kövecses, J., Angeles, J. "A novel concept for analysis and performance evaluation of wheeled rovers". Mechanism and Machine Theory, Vol. 83, pp. 137-151, 2015.
2. Bai, S. and Angeles, J., 2015, “Coupler curve synthesis of four-bar linkages via a novel formulation,” Mechanism and Machine Theory, Vol. 94, pp. 177-187.
3. Zou, T. and Angeles, J., 2015, “The decoupling of the Cartesian stiffness matrix in the design of microaccelerometers,” Multibody System Dynamics, Vol. 34, No. 1, pp. 1-21, DOI: 10.1007/s11044-014-9408-9.
4. Zhu, X. and Angeles, J., 2015, “A reparametrization of the rotation matrix in rigidbody dynamics,” ASME J. Applied Mechanics, Vol. 82, pp. 051003-1--051003-9.
5. Angeles, J., 2015, “The role of the rotation matrix in the teaching of planar kinematics,” Mechanism and Machine Theory, Vol. 89, pp. 28-37.
6. Azimi, A., Holz, D., Kövecses, J., Angeles, J. and Teichmann, M., 2015, “A multibody dynamics framework for simulation of rovers on soft terrain,” ASME J. Computational and Nonlinear Dynamics, Vol. 10, May, pp. 031004-1--031004-12, DOI: 10.1115/1.4029406.

Other refereed contributions

7. "A Redundancy-resolution Algorithm for Five-degree-of-freedom Tasks via Sequential Quadratic Programming '', Proc. TrC-IFToMM Symposium on Theory of Machines and Mechanisms, Izmir, Turkey, June 14-17, 2015, 8 pp., by J. Léger and J. Angeles. This paper won "The Best Theoretical Paper" Award at the conference.
8. "Optimization of tooth-root profile for maximum load-carrying capacity: spur and bevel gears", at the 2015 CCToMM Symposium on Mechanisms, Machines, and Mechatronics, Ottawa, by M. Shaker, T. Zou, J. Angeles and A. Morozov.
9. "Design of a spherical cam mechanism for an automotive differential", 2015 CCToMM Symposium on Mechanisms, Machines, and Mechatronics, Ottawa, by M. Chaudhary, J. Angeles and A. Morozov.
10. "Design and implementation of an X-by-wire automotive prototype", 2015 CCToMM Symposium on Mechanisms, Machines, and Mechatronics, Ottawa, by G. Sauze, M.S. Rahimi Mousavi, A. Morozov, J. Angeles and B. Boulet.
11. "Design of a pitch-roll joystick based on three-lobe spherical cam mechanism", 2015 CCToMM Symposium on Mechanisms, Machines, and Mechatronics, Ottawa, by D. Saha, J. Angeles and J. Kövecses.

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12. "Dynamics and control of a novel two-degree-of-freedom drive", ECCOMAS Thematic Conference on Multibody Dynamics, Barcelona, by T. Friedlaender and J.

Angeles.
13. "Experimental verification of performance improvement strategies for planetary exploration rovers", ECCOMAS Thematic Conference on Multibody Dynamics 2015, Barcelona, June 29 - July 2, 2015, by Q. Lou, S., MacMahon, B. Ghotbi, F. González, J. Kövecses, and J. Angeles.
14. "Mobility assessment of wheeled robots operating on soft terrain, The 10th Conference on Field Service Robotics (FSR 2015), Toronto, by B. Ghotbi, F. González, J. Kövecses and J. Angeles.
15. "Effect of internal actuation on the mobility of wheeled robots on unstructured terrain", ASME 2015 Design Engineering Technical Conferences (IDETC 2015), DETC2015-47614, Boston, MA, August 2-5, 2015, by B. Ghotbi, F. González, J. Kövecses and J. Angeles.
16. "Mobility of multi-axle wheeled robots on soft terrain", ASME 2015 Design Engineering Technical Conferences (IDETC 2015), DETC2015-47496, Boston, MA, August 2-5, 2015 (short paper), by B. Ghotbi, F. González, J. Kövecses and J. Angeles.
17. "Traction improvement in multi-axle wheeled robots", International Society for Terrain-Vehicle Systems (ISTVS) 13th European Conference, Rome, October 21-23, 2015, by B. Ghotbi, F. González, J. Kövecses and J. Angeles.
18. "Pose estimation using redundant measurements and polar-decomposition filtering", 14th IFToMM World Congress on MMS Taipei, Taiwan, by X. He, J. Angeles and J. Kövecses.
Non-refereed contributions
19. “The Kinematics of Pointing”, a report submitted to the Czech Technical University in Prague, at the end of a three-month visit (January-March, 2015) during sabbatical leave.
All other publications, including those from research that you supervised
20. Performance Evaluation and Dynamics of Rovers for Planetary Exploration, B. Ghotbi's PhD thesis (Cosupervisor: J. Kövecses)
21. Design, Control and Testing of a Pick-and-Place Robot and its Novel Actuators, T. Friedlaender's M.Eng. Thesis
22. A Calibration Method for Spherical Parallel Robots, X. He's M.Eng. Thesis (Cosupervisor: J. Kövecses)
23. Bevel Gears vs. Spherical Cams and Rollers: a Comparative Study for Applications as Automotive Differentials, M. Chaudhary's M.Eng. Project Report
24. Design of a Pitch-Roll Joystick Using a Spherical Cam Mechanism, D. Saha's MEng Project Report (Cosupervisor: J. Kövecses)
25. Design and Synthesis of Custom-moulded Earphone Sleeve, Surjit Singh's MEng Project Report (Cosupervisor: Prof. M. Maric, Chemical Engineering)
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Arbel, Tal

Articles in refereed publications
26. M. Demirkus*, D. Precup, J. J. Clark and T. Arbel, "Hierarchical Temporal Graphical Model for Head Pose Estimation and Subsequent Attribute Classification in Real-

World Videos", Computer Vision and Image Understanding (CVIU), Special Issue on Generative Models in Computer Vision, Vol. 136, pp. 128-145, July 2015.
27. Z. Karimaghaloo*, H. Rivaz, D. L. Arnold, D. L. Collins and T. Arbel, "Temporal Hierarchical Adaptive Texture CRF for Automatic Detection of Gadolinium-Enhancing Multiple Sclerosis Lesions in Brain MRI", IEEE Transactions on Medical Imaging, Vol. 34, No. 6, pp. 1227-1241, June 2015.
28. R. Harmouche*, N. Subbanna*, D. L. Collins, D. L. Arnold and T. Arbel, "Probabilistic Multiple Sclerosis Lesion Classification based on Modelling Regional Intensity Variability and Local Neighbourhood Information", IEEE Transactions on Biomedical Engineering", Vol. 62, No. 5, pp. 1281-1292, May 2015.
29. B. H. Menze, A. Jakaby, S. Bauery, J. Kalpathy-Cramery, K. Farahaniy, J. Kirbyy, Y. Burreny, N. Porzy, J. Slotboomy, R. Wiesty, L. Lancziy, E. Gerstnery, M. Webery, T. Arbel, B. B. Avants, N. Ayache, P. Buendia, D. L. Collins, N. Cordier, J. J. Corso, A. Criminisi, T. Das, H. Delingette, C. Demiralp, C. R. Durst, M. Dojat, S. Doyle, J. Festa, F. Forbes, E. Geremia, B. Glocker, P. Golland, X. Guo, A. Hamamci, K. M. Iftekharuddin, R. Jena, N. M. John, E. Konukoglu, D. Lashkari, J. A. Mariz, R. Meier, S. Pereira, D. Precup, S. J. Price, T. Riklin Raviv, S. M. S. Reza, M. Ryan, D. Sarikaya, L. Schwartz, H. Shin, J. Shotton, C. A. Silva, N. Sousa, N. K. Subbanna*, G. Szekely, T. J. Taylor, O. M. Thomas, N. J. Tustison, G. Unal, F. Vasseur, M. Wintermark, D. Hye Ye, L. Zhao, B. Zhao, D. Zikic, M. Prastaway, M. Reyesyz, K. Van Leemput, "The Multimodal Brain Tumor Image Segmentation Benchmark (BRATS)", IEEE Transactions on Medical Imaging, Vol. 34, No. 10, pp. 1993-2024, October 2015.

Papers in refereed conference proceedings

30. I. J. Gerard, M. Kersten-Oertel, S. Drouin, J. A. Hall, K. Petrecca, D. De Nigris*, T. Arbel, D. L. Collins, "Improving Patient Specific Neurosurgical Models with Intraoperative Ultrasound and Augmented Reality Visualizations in a Neuronavigation Environment", In Proceedings of the 4th MICCAI Workshop on Clinical Image-based Procedures: Translational Research in Medical Imaging (CLIP 2015) held in conjunction with the 18th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI '15), Munich, Germany, Oct. 5, 2015. BEST PAPER AWARD
31. N. Subbanna*, D. Precup, D. L. Arnold, and T. Arbel, "IMaGe: Iterative Multilevel Probabilistic Graphical Model for Detection and Segmentation of Multiple Sclerosis Lesions in Brain MRI", In Proceedings of The 24th Biennial International Conference

on Information Processing in Medical Imaging (IPMI 2015), Isle of Skye, Scotland, June 2015, pp. 514-526.

All other publications, including those from research that you supervised

32. N. Subbanna*, PhD Thesis, "Iterative Multilevel Probabilistic Graphical Model for Detection and Segmentation of Tumours and Lesions in Brain MRI", Electrical and Computer Engineering, McGill University, defended Dec. 2015.
33. M. Zaltzhendler*, MEng Thesis, "A Deep-Learning Convolutional Neural Network Framework for Multiple Sclerosis Lesion Detection and Segmentation in Patient

Brain Images", Electrical and Computer Engineering, McGill University, Dec. 2015.

Boulet, Benoit

Articles in refereed publications

34. MSR Mousavi, A Pakniyat, T Wang, B Boulet, “Seamless dual brake transmission for electric vehicles: Design, control and experiment” Mechanism and Machine Theory, 94, 96-118. 2015.

35. Haddadi, A., Boulet, B., Yazdani, A., Joos, G., “A μ-based approach to small-signal stability analysis of an interconnected distributed energy resource unit and load,” IEEE Trans. on Power Delivery, Vol. 30, No. 4, Aug. 2015, pp. 1715-1726.

Other refereed contributions

36. A. Najmabadi, K. Humphries, B. Boulet, “Implementation of a Bidirectional DC-DC in Electric Powertrains for Drive Cycles Used by Medium Duty Delivery Trucks” Energy Conversion Congress and Exposition (ECCE), 2015 IEEE, 1338-1345.

37. M. S. R. Mousavi, A. Pakniyat, M. K. Helwa, B. Boulet, “Observer-Based Backstepping Controller Design for Gear Shift Control of a Seamless Clutchless Two-Speed Transmission for Electric Vehicles” IEEE Vehicle Power and Propulsion Conference (VPPC), 2015 1-6.

38. A. Najmabadi, K. Humphries, B. Boulet, “Effects of Target Modulation Index on Variable DC Voltage Control for Electric Powertrains in Medium Duty Delivery Trucks” IEEE Vehicle Power and Propulsion Conference (VPPC), 2015 1-6.

39. H. V. Alizadeh, M. S. R. Mousavi, B Boulet, “Synchromesh Torque Estimation in an Electric Vehicle's Clutchless Automated Manual Transmission Using Unknown Input Observer” IEEE Vehicle Power and Propulsion Conference (VPPC), 2015 1-5.

40. R. Tahmasebi, H. V. Alizadeh, B Boulet, “Robust Gear Shifting Force Control of a Solenoid Actuator in an Automated Manual Transmission of an Electric Vehicle via Mu-Synthesis” IEEE Vehicle Power and Propulsion Conference (VPPC), 2015 1-6.

41. M. S. R. Mousavi, B. Boulet, “Dynamical modeling and optimal state estimation using Kalman-Bucy filter for a seamless two-speed transmission for electric vehicles” 2015 Mediterranean Conference on Control and Automation, Torremolinos, Spain, pp. 76-81.

McGill Centre for Intelligent Machines (CIM) Annual Report 2015

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All other publications, including those from research that you supervised

42. Haddadi, A. “Modeling, Control, and Stability Analysis of an Islanded Microgrid” Ph.D. Thesis, Department of Electrical and Computer Engineering, McGill University, 2015, Montreal, Quebec, Canada.

43. Najmabadi, A. “Application of a Bidirectional DC-DC in an Electric Powertrain for Medium Duty Delivery Trucks” M.Eng. Thesis, Department of Electrical and Computer Engineering, McGill University, 2015, Montreal, Quebec, Canada.

44. Tahmasebi, R. “Modeling and Control of a Solenoid Actuator with Application in Electric Vehicle Transmission” M.Eng. Thesis, Department of Electrical and Computer Engineering, McGill University, 2015, Montreal, Quebec, Canada.

Contributions to industrially relevant research and development

45. S. Rahimi-Mousavi, B. Boulet, H. Vahid Alizadeh, United States patent application No.

US 62/056,710 (following US Provisional Patent Submission No. 61883302, ROI 13070), “Seamless two-speed transmission for electric vehicles”, Sept. 2015.
46. S. Rahimi-Mousavi, B. Boulet, H. Vahid Alizadeh, Canadian Patent Application No. 2,893,5355, “Seamless two-speed transmission for electric vehicles”, May 2015.

Caines, Peter

Publications in journals
47. D. Gromov and P.E.Caines, “Stability of Composite Thermodynamic Systems with Interconnection Constraints.” Institute of Engineering and Technology Journal on Control Theory and Applications, 2015, pp 1-8, ISSN 1751-8644, doi: 10.1049/ietcta.2014.0867
Publications in refereed conference proceedings
48. A. Pakniyat, and P. E. Caines, “On the Minimum Principle and Dynamic Programming for Hybrid Systems with Low Dimensional Switching Manifolds,” Proceedings of the 54th IEEE Conference on Decision and Control, Osaka, Japan, December, 2015, pp. 2567-2573.
49. N. Sen, and P. E. Caines, “On the Generation of Conditional Densities in Nonlinear Filtering for McKean-Vlasov Systems,” Proceedings of the 54th IEEE Conference on Decision and Control, Osaka, Japan, December, 2015, pp. 1130-1135.
50. D. Firoozi, and P. E. Caines, “Epsilon-Nash Equilibria for Partially Observed LQG Mean Field Games with Major Agent: Partial Observations by All Agents,” Proceedings of the 54th IEEE Conference on Decision and Control, Osaka, Japan, December, 2015, pp. 4430-4437.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015

51. M. K. Helwa, and P. E. Caines, “Epsilon Controllability of Nonlinear Systems on Polytopes,” Proceedings of the 54th IEEE Conference on Decision and Control, Osaka, Japan, December, 2015, pp. 252-257.
52. M. K. Helwa, and P. E. Caines, “On the Construction of In-Block Controllable Covers of Nonlinear Systems on Polytopes,” Proceedings of the 54th IEEE Conference on Decision and Control, Osaka, Japan, December, 2015, pp. 276-281.
53. N. Sen and P. E. Caines, “On Nonlinear Filtering Theory for McKean-Vlasov SDEs,” SIAM Conference on Control and Applications, Paris, July, 2015. http://www.siam.org/meetings/ct15/ct15_abstracts.pdf, pp.39.
54. P. E. Caines, “Nonlinear Mean Field Games with Partially Observed Major Player and Stochastic Mean Field,” Mean Field Games and Related Topics III, Institut Henri Poincare, Paris, 10 – 12 June, 2015.
55. C. Mueller-Roemer and P. E. Caines, “An Isothermal Energy Function State Space Model of a Stirling Engine,” Preprints, 1st IFAC Conference on Modelling, Identification and Control of Nonlinear Systems, Saint Petersburg, Russia, June 24-26, 2015, pp 644 – 649.
56. A. Pakniyat, and P. E. Caines, “Time Optimal Hybrid Minimum Principle and the Gear Changing Problem for Electric Vehicles,” Proceedings of the 5th IFAC Conference on Analysis and Design of Hybrid Systems, Atlanta, GA, USA, 2015, Volume 48, Issue 27, pp. 187-192.

57. A. Pakniyat, and P. E. Caines, “On the Relation between the Hybrid Minimum Principle and Hybrid Dynamic Programming: a Linear Quadratic Example,” Proceedings of the 5th IFAC Conference on Analysis and Design of Hybrid Systems, Atlanta, GA, USA, 2015, Volume 48, Issue 27, pp. 169-174.
58. P. Prokopiou, P. E. Caines and A. Mahajan, “An Estimation Based Allocation Rule with Super-linear Regret and Finite Lock-on Time for Time-dependent Multi-armed Bandit Processes”, IEEE Canadian Conf. on Elec. and Comp. Eng., Halifax, 4 -6 May, 2015.
59. N. Sen and P. E. Caines, “Nonlinear Mean Field Games with Partially Observed Major Player and Stochastic Mean Field,” India Control Conference, 5 – 7 January, 2015, Chennai, Madras.

Clark, James

Articles in refereed publications
60. *Demirkus, M., Precup, D., Clark, J.J. and Arbel, T., “Hierarchical Temporal Graphical Model for Head Pose Estimation and Subsequent Attribute Classification in Real-World Videos,” Computer Vision and Image Understanding, Vol. 136, pp 128-145, 2015.
61. *Rezagholizadeh, M., Akhavan, T., Soudi, A., Kaufmann, H., and Clark, J.J., “A color retargeting approach for mesopic vision: simulation and compensation,” Journal of Imaging Science and Technology, vol. 60, pp 1-12.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015

Other refereed contributions
62. *Bouchard, J., *Nazzar, Y., and Clark, J.J., “Half-Occluded Regions and Detection of Pseudoscopy,” International Conference on 3D Vision (3DV), Lyon, France, October 2015.
63. *Rezagholizadeh, M. and Clark, J.J., “Image Sensor Modeling: Noise and Linear Transformation Impacts on the Color Gamut,” 12th Conference on Computer and Robot Vision (CRV), Halifax, Canada, May 2015.
All other publications, including those from research that you supervised
64. Nazzar, Yasin, M.Eng. thesis. “Automated detection of defects in 3D movies.” July 2015.

Cooperstock, Jeremy

Articles in refereed publications
65. R. F. Hess, *L. To, J. Zhou, *G. Wang, and J.R. Cooperstock. “3D Vision: the haves and havenots.” In: i-Perception 6.3 (June 2015). url: http://ipe.sagepub.com/content/6/3/2041669515593028.full.pdf+html.
66. *N. Hieda and J. R. Cooperstock. “Digital Facial Augmentation for Interactive Entertain- ment.” In: EAI Endorsed Transactions on e-Learning 15.8 (Aug. 2015). doi: 10.4108/ icst.intetain.2015.259444.
Papers in refereed conference proceedings
67. *J. Blum, I. Frissen, and J. R. Cooperstock. “Improving Haptic Feedback on Wearable Devices through Accelerometer Measurements.” In: User Interface Software and Technology (UIST). Charlotte, NC: ACM, Nov. 2015. url: http://dl.acm.org/citation.cfm?id= 2807474.

68. *D. El-Shimy and J. R. Cooperstock. “EmbodiNet: Enriching Distributed Musical Collaboration through Embodied Interactions.” In: IFIP TC13 Conference on Human-Computer Interaction (INTERACT). Bamberg, Germany, Sept. 2015.
69. *V. Vuibert, W. Stuerzlinger, and J. R. Cooperstock. “Evaluation of docking task performance using mid-air interaction techniques.” In: Symposium on Spatial User Interaction. Los Angeles, CA: ACM, Aug. 2015.
70. *F. Tordini, A. Bregman, and J. R. Cooperstock. “The loud bird doesn't (always) get the worm: Why computational salience also needs brightness and tempo.” In: International Conference on Auditory Displays. Graz, Austria, July 2015.
71. *J. Anlauff, J. Fung, and J. R. Cooperstock. “Modular Haptic Belt for Augmented Balance Feedback.” In: International Society for Posture and Gait Research. Seville, Spain, June 2015.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015
32
72. *N. Hieda and J. R. Cooperstock. “sharedFace: Interactive Facial Projection Mapping.” In: International Conference and Exhibition of Virtual Technologies and Uses. Laval, France, Apr. 2015.
Non-refereed contributions
73. “Leveraging video in public safety scenarios,” invited presentation for Ninth Canadian Public Safety Interoperability Workshop (CITIG 9), Toronto, December 1, 2015.
All other publications, including those from research that you supervised
74. *V. Vuibert, “Efficient and Accurate Performance with Unconstrained Mid-air Interaction.” Master's Thesis, Electrical and Computer Engineering, McGill University.
75. *N. Hieda, “Digital Video Projection for Interactive Entertainment.” Master's Thesis, Electrical and Computer Engineering, McGill University.
Contributions to industrially relevant research and development
76. J. R. Cooperstock and *J. Blum. “Method and system for haptic feedback.” provisional application 62/237,772 (United States) filed, October 2015.
77. J. R. Cooperstock, *Y. Visell, *A. Law, and K. Franinovic. “Floor-based haptic communication system.” 9041521 (United States). Patent issued, May 26, 2015.

Cortelezzi, Luca

78. Rosti, M., Cortelezzi, L., and Quadrio, M., “Direct Numerical simulation of turbulent channel flow over porous walls.” Journal of Fluid Mechanics, vol. 784, December 2015, pp. 396-442, Cambridge University Press. doi:10.1017/jfm.2015.566
79. Tilton, N. and Cortelezzi, L., “Stability of Boundary Layers over Porous Walls with Suction.” AIAA Journal, Vol. 53, No. 10, October 2015. DOI: 10.2514/1.J053716

Dudek, Gregory

Conference publications
80. Zhang, Q., Rekleitis, I., and Dudek, G., “Uncertainty Reduction via Heuristic Search Planning on Hybrid Metric/Topological Map.” In Proceedings of the 2015 Conference on Computer and Robot Vision, Halifax, Canada. June 2015.
81. Manjanna, S. and Dudek, G., “Autonomous Gait Selection for Energy Efficient

Walking." In Proceedings of the 2015 IEEE International Conference on Robotics and Automation, Seattle, US. May 2015.
82. Meger, D., Higuera, J.C.G., Xu, A., Giguere, P., and Dudek, G., "Learning Legged Swimming Gaits from Experience." In Proceedings of the 2015 IEEE International
McGill Centre for Intelligent Machines (CIM) Annual Report 2015
33
Conference on Robotics and Automation, Seattle, US. May 2015. (finalist for Best Conference Paper Award)
83. Xu, A. and Dudek, G., "Towards Efficient Collaborations with Trust-Seeking Adaptive Robots." In Proceedings of the 10th ACM/IEEE International Conference on Human-Robot Interactions Extended Abstracts / 10th Human-Robot Interaction Pioneers Workshop (HRI Pioneers '15), pages 221-222, Portland, USA, March 2015.
84. Xu, A. and Dudek, G., "OPTIMo: Online Probabilistic Trust Inference Model for Asymmetric Human-Robot Collaborations." In Proceedings of the 10th ACM/IEEE International Conference on Human-Robot Interactions (HRI '15), pages 221-228, Portland, USA, March 2015.

Ferrie, Frank

Articles in Refereed Journals
85. Wang, Ruisheng, and Ferrie, F.P., "An Image-based Interpolation Method for Mobile LiDAR", Journal of Applied Remote Sensing, Vol. 9, No. 1, June 2015.
86. Wang, Ruisheng, and Ferrie, F.P., "An Automatic Registration Method for Mobile LiDAR Data," Optical Engineering, Volume 54, No. 1, January 2015.
87. Abou-Moustafa, K.T., de la Torre, F., and Ferrie, F.P., "Pareto Models for Multiclass Discriminative Linear Dimensionality Reduction," Pattern Recognition, Vol. 48, Issue 5, May 2015, pp. 1863-1877.
Articles in Refereed Conference Publications
88. Phan, Andrew, and Ferrie, F.P., "Towards 3D Human Posture Estimation Using Multiple Kinects Despite Self-Contacts," Proc. 14th IAPR International Conference on Machine Vision Applications, Tokyo, Japan, May 18-22, 2015, pp. 567-571.
89. Mu, Yanyan, and Ferrie, F.P., "Sparse Image Reconstruction by Two Phase RBM Learning: Application to Mine Planning," Proc. 14th IAPR International Conference on Machine Vision Applications, Tokyo, Japan, May 18-22, 2015, pp. 316-320.
90. St-Martin Cormier, O., Phan, A., and Ferrie, F.P., "Situational Awareness for Manufacturing Applications," Proc. 12th Conference on Computer and Robot Vision, Halifax, Nova Scotia, June 3-5, 2015, pp. 320-327.

Forbes, James Richard

Articles in refereed publications
91. F. R. Hogan and J. R. Forbes, "Modeling of a Rolling Flexible Circular Ring," ASME Journal of Applied Mechanics, vol. 82, pp. 111003 (1–14), November 2015.
92. A. Walsh and J. R. Forbes, "Modeling and Control of Flexible Telescoping Manipulators," IEEE Transactions on Robotics, vol. 31, no. 4, pp. 936–947, 2015.
93. A. H. J. de Ruiter and J. R. Forbes, "Generalized Euler Sequences Revisited," Journal of the Astro- nautical Sciences, vol. 62, pp. 1–20, March 2015.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015

34
94. J. R. Forbes, “Direction-Cosine-Matrix-Based Attitude Control Subject to Actuator Saturation,” IET Control Theory and Applications, vol. 9, no. 11, pp. 1653–1661, 2015.
95. F. R. Hogan and J. R. Forbes, “Modeling of Spherical Robots Rolling on Generic Surfaces,” Multibody System Dynamics, vol. 35, no. 1, pp. 91–109, 2015.
Other refereed contributions
96. E. A. Bering, L. S. Pinsky, L. Li, D. Jackson, J. Chen, H. Reed, M. Moldwin, J. Kasper, J. P. Sheehan, J. R. Forbes, T. Heine, A. Case, M. Stevens, and D. G. Sibeck, “MarsCAT: Mars Array of ionospheric Research Satellites using the CubeSat Ambipolar Thruster,” AIAA Science and Technology Forum and Exposition 2016, San Diego, CA, January 4–8, 2016.
97. S. A. Chee and J. R. Forbes, “Norm-constrained Unscented Kalman Filter with Application to High Area-to-Mass Ratio Space-Debris Tracking,” AIAA Science and Technology Forum and Ex- position 2016, San Diego, CA, January 4–8, 2016.
98. F. R. Hogan and J. R. Forbes, “Trajectory Tracking of a Pendulum-Driven Spherical Robot,” ASME 2015 Dynamic Systems and Control Conference, Columbus, OH, October 28-30, 2015.
99. F. R. Hogan, J. R. Forbes, and A. Walsh, “Dynamic Modeling of a Flexible Rolling Sphere,” Proc. 11th International Conference on Multibody Systems, Nonlinear Dynamics, and Control, Boston, MA, August 2-5, 2015.
100. D. E. Zlotnik and J. R. Forbes, “A Nonlinear Attitude Estimator with Desirable Convergence Properties,” European Control Conference, Linz, Austria, July 15-17, 2015.
101. L. Bridgeman, M. Najih, and J. R. Forbes, “Using an Observer to Transform a Linear System Into an Interior Conic System,” American Control Conference, Chicago, IL, July 1-3, 2015.
102. A. Walsh and J. R. Forbes, “Control of a Planar Wind Energy Harvesting Kite with Flexible Cables,” American Control Conference, Chicago, IL, July 1-3, 2015. Special session on Dynamics and Control of Airborne Wind Energy Systems.
103. R. J. Caverly and J. R. Forbes, “Maintaining Positive Cable Tensions During Operation of a Single Degree of Freedom Flexible Cable-Driven Parallel Manipulator,” American Control Conference, Chicago, IL, July 1-3, 2015. Awarded “Best Paper” in session.
104. L. Bridgeman and J. R. Forbes, “Conic-Sector-Based Control in the Presence of Delay,” 12th IFAC Workshop on Time Delay Systems (TDS 2015), Ann Arbor, MI, June 28-30, 2015.

Kovecses, Jozsef

Articles in refereed publications
McGill Centre for Intelligent Machines (CIM) Annual Report 2015
35
105. Gholami, F., Pamies Vila, R., Kövecses, J., and Font-Llagunes, J.M., “Effects of Foot Modelling on the Human Ankle Kinematics and Dynamics,” Mechanism and Machine Theory, Vol. 93, pp. 175-184, November 2015.

106. Mohtat, A. and Kövecses, J., “High-Fidelity Rendering of Contact with Virtual Objects,” ASME Journal of Dynamic Systems, Measurement and Control, Vol. 137, No. 7, 071009 (12 pages), July 2015.
107. Ros, J., Font-Llagunes, J.M., Plaza, A., and Kövecses, J., “Dynamic Considerations of Heel-Strike Impact in Human Gait.” Multibody System Dynamics, Vol. 35, Issue 3, pp 215-232, November 2015.
108. Azimi, A., Holz, D., Kövecses, J., Angeles, J. and Teichmann, M., “A Multibody Dynamics Framework for Simulation of Rovers on Soft Terrain.” ASME Journal of Computational and Nonlinear Dynamics, Vol.10, No. 3, pp. 031004-1-12 (12 pages), 2015.
109. Ghotbi, B., Gonzalez, F., Kövecses, J., Angeles, J., “A Novel Concept for Analysis and Performance Evaluation of Wheeled Rovers.” Mechanism and Machine Theory, Vol. 83, pp. 137-151, 2015.
110. Hassanbeiglou, A., Kalantari, M., Mozafa, E., Dargahi, J., and Kövecses, J.: “A New Tactile Array Sensor for Viscoelastic Tissues with Time-Dependent Behavior.” Sensor Review, Sensor Review, Vol. 35 Issue 4, pp. 374 - 381, 2015.

Other refereed contributions

111. Kovacs L.L. and Kövecses J., “Dynamics of Coupled Haptic Systems,” IEEE World Haptics Conference (WHC 2015), Evanston, IL, pp. 286-292, June 22-26, 2015. (Acceptance rate for this conference was 43%)
112. Gallacher, C., Willes, J. and J. Kövecses, J., “Parasitic Effects of Device Coupling on Haptic Performance,” IEEE World Haptics Conference (WHC 2015), Evanston, IL, pp. 266-272, June 22-26, 2015. (Acceptance rate for this conference was 43%)
113. Mohtat, A. and Kövecses, J., “Direct Impulse-Based Rendering in Force Feedback Haptics,” IEEE World Haptics Conference (WHC 2015), Evanston, IL, pp. 313-320, June 22-26, 2015. (Acceptance rate for this conference was 43%)
114. Gallacher, C., Harrison, J. and Kövecses, J., “Characterizing Device Dynamics for Haptic Manipulation and Navigation,” 2015 IEEE International Conference on Robotics and Automation, Seattle, WA, pp. 3689-3695, May 26-30, 2015. (Acceptance rate for this conference was 41%)
115. Dinh-Son Vu, Foucault, S., Gosselin, C. and Kövecses, J., “Design of a Locomotion Interface for Gait Simulation based on Belt-Driven Parallel Mechanisms,” 2015 IEEE International Conference on Robotics and Automation, Seattle, WA, pp. 1581-1586, May 26-30, 2015. (Acceptance rate for this conference was 41%)
116. Kövecses J. and Kovacs L.L., “Effective Stiffness: Static Performance of Mechanical Systems,” 14th IFToMM World Congress on Mechanism and Machine Science, Taipei, Taiwan, OS11.015 (5 pages), 25-30 October, 2015.
117. Kövecses J. and Kovacs L.L., “Inertia Properties and Representations in Mechanical Systems,” ASME 2015 International Design Engineering Technical

Conferences (IDETC 2015), Boston, MA, DETC2015-47582 (4 pages), August 2-5, 2015.
118. Ghotbi. B., González, F., Kövecses, J., Angeles, J., “Mobility Assessment of

Wheeled Robots Operating on Soft Terrain," The 10th Conference on Field Service Robotics (FSR 2015), Toronto, Canada, (8 pages) June 24 -26, 2015. Proceedings will be published as a book in Springer Tracts in Advanced Robotics.
119. Ghotbi. B., González, F., Kövecses, J., Angeles, J., "Effect of Internal Actuation on the Mobility of Wheeled Robots on Unstructured Terrain," ASME 2015 Design Engineering Technical Conferences (IDETC 2015), DETC2015-47614, Boston, MA, USA, August 2-5, 2015.
120. He, X., Angeles, J. and Kövecses, J., "Pose Estimation Using Redundant Measurements and Polar-Decomposition Filtering," 14th IFToMM World Congress on Mechanism and Machine Science, Taipei, Taiwan, IMD 123 (5 pages), 25-30 October, 2015.
121. Kovacs L.L. and Kövecses J., "Inertia Effects on Virtual Contact Dynamics in Haptic Displays," ECCOMAS Thematic Conference on Multibody Dynamics, Barcelona, Spain, A214 (2 pages), June 29 - July 2, 2015.
122. Pringle, R., Gallacher, C., Ciot, M. and Kövecses, J., "A Reconfigurable Planar Haptic Device with Tablet Display," IEEE World Haptics Conference (WHC 2015), Evanston, IL, physical demonstration, June 22-26, 2015.
123. Callejo, A., Arbatani, S., Kövecses, J. and Dargahi, J., "Finite Element and Finite Segment Methods with Contact: An Approach to Directional Drilling Simulation," IV International Conference on Computational Contact Mechanics, Hannover, Germany, (abstract with presentation), 27-29 May 2015.
124. Gholami, F., Nasri, M., Kövecses, J. and Teichmann, M., "A Fast Implementation of the Box Friction Model for Multi-rigid-body Dynamics," IV International Conference on Computational Contact Mechanics, Hannover, Germany, (abstract with presentation), May 27–29, 2015.
125. Ghotbi. B., Gonzalez, F., Kövecses, J., Angeles, J., "Traction Improvement in Multi-Axle Wheeled Robots," International Society for Terrain-Vehicle Systems (ISTVS) 13th European Conference, Rome, Italy, October 21-23, 2015.
126. Gholami, F., Nasri, M. and Kövecses. J., "Multi Rigid-Body Contact Dynamics with Regularized Friction," 2015 Design Engineering Technical Conferences (IDETC 2015), DETC2015-47814, Boston, MA, USA, August 2-5, 2015.
127. Ghotbi, B., Gonzalez, F., Kövecses, J., Angeles, J., "Mobility of Multi-Axle Wheeled Robots on Soft Terrain," ASME 2015 Design Engineering Technical Conferences (IDETC 2015), DETC2015-47496, Boston, MA, USA, August 2-5, 2015. (short paper and technical presentation)
128. S. MacMahon, F. Gonzalez, B. Ghotbi, J. Kövecses, "A New Performance Indicator for Impact Analysis with Applications to Planetary Rovers," ASME 2015 International Design Engineering Technical Conferences (IDETC 2015), DETC2015-47747, Boston, MA, USA, August 2-5, 2015. (short paper and technical presentation)
McGill Centre for Intelligent Machines (CIM) Annual Report 2015
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129. Gholami, F., Nasri, M. and Kövecses, J., "A Complementarity Problem Approach for Multibody Contact Dynamics with Regularized Friction," ECCOMAS Thematic Conference on Multibody Dynamics 2015, Barcelona, Spain, June 29 - July 2, 2015.

130. Ghotbi. B., Gonzalez, F., Kövecses, J., Angeles, J., “Effect of Multi-Pass on the Mobility of Wheeled Robots on Soft Terrain,” ECCOMAS Thematic Conference on Multibody Dynamics 2015, Barcelona, Spain, June 29 - July 2, 2015.
131. MacMahon, S., Gonzalez, F., Ghotbi, B., Kövecses, J., “Analysis of Impact Manoeuvres with Planetary Exploration Rovers,” ECCOMAS Thematic Conference on Multibody Dynamics 2015, Barcelona, Spain, June 29 - July 2, 2015.
132. Lou, Q., MacMahon, S., Ghotbi, B., Gonzalez, F., Kövecses, J., Angeles, J., “Experimental Verification of Performance Improvement Strategies for Planetary Exploration Rovers,” ECCOMAS Thematic Conference on Multibody Dynamics 2015, Barcelona, Spain, June 29 - July 2, 2015.
133. Saha, D., Angeles, J. and Kövecses, J., “Design of a Pitch-Roll Joystick based on Three-Lobe Spherical Cam Mechanism,” 2015 CCToMM Symposium on Mechanisms, Machines, and Mechatronics, Ottawa, ON, May 28-29, 2015.
134. Kövecses, J., “On the Role of Mechanisms in Haptic Systems,” The Third Conference on Mechanisms, Transmissions and Applications (MeTrApp 2015), Aachen, Germany, May 6-8, 2015.

Kry, Paul

Refereed journals
135. Andrews, S., Teichmann, M., Kry P. G., “Blended linear models for reduced compliant mechanical systems,” IEEE Transactions on Visualizaiton and Computer Graphics (TVCG), v. 22, n. 3, pp. 1209-1222, 2015. doi>10.1109/TVCG.2015.2453951
Refereed conference proceedings
136. Lejemble T., Fondevilla A., Durin N., Blanc-Beyne T., Schreck C., Manteaux P-L., Kry P. G., Cani M.-P., “Interactive procedural simulation of paper tearing with sound,” ACM SIGGRAPH Conference on Motion in Games (MIG), pp. 143-149, 2015. doi>10.1145/2822013.2822029
137. Bouchard C., Nesme M., Tournier M., Wang B., Faure F., Kry P. G., “6D Frictional Contact for Rigid Bodies,” Graphics Interface, pp. 105-114, 2015. url>http://dl.acm.org/citation.cfm?id=2788890.2788910

Langer, Michael

Refereed journal publications
138. M. S. Langer, R. Siciliano, “Are blur and disparity complementary cues to depth?” Vision Research, 107, pp. 15-21, 2015.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015
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Refereed conference publications
139. F. Mannan, M. S. Langer, “Optimal camera parameters for depth from defocus,” International Conference on 3D Vision (3DV), Lyon France, 19-22 Oct 2015. pp. 326-334
Invited lectures
140. “Shape from Shading, Highlights, and Mirror Reflections,” International Conference on Perceptual Organization, York University Toronto, June 24, 2015

Levine, Martin

Articles in refereed publications

141. Roshtkhari, Mehrsan Javan & Martin D. Levine, “Tracking Without Appearance Descriptors,” Handbook of Pattern Recognition and Computer Vision, 5th Edition, Edited by: C H Chen, Dec. 2015, Chapter 2-3, pp. 239-254.
142. Zhang, Q., Wang, Y., Levine, M. D., Yuan, X., & Wang, L., “Multisensor Video Fusion Based On Higher Order Singular Value Decomposition,” Information Fusion, 2015, vol. 24, pp. 54-71.
143. Qiang Zhang, Martin D. Levine, “Robust Multi-Focus Image Fusion Using Multi-Task Sparse Representation and Spatial Context,” IEEE Transactions on Image Processing, ACCEPT - TIP-14030-2015.R2, accepted for publication.
144. Su, L, Levine, M.D., “Does “Lie to Me” Lie to You? An Evaluation of Facial Clues to High-stakes Deception,” Computer Vision and Image Understanding (CVIU), accepted for publication.
145. Balazsi, M., Levine, M.D., “An Automated Approach for Segmenting Regions Containing Invasive Ductal Breast Carcinomas in Whole Digital Slides” Journal of Medical Imaging, accepted for publication.

Mahajan, Aditya

Articles in refereed publications
146. A. Mahajan and A. Nayyar, “Sufficient statistics for linear control strategies in decentralized systems with partial history sharing,” IEEE Transactions on Automatic Control, vol. 60, no. 8, pp. 2046–2056, Aug 2015.
147. A. Mahajan and S. Tatikonda, “An algorithmic approach to identify irrelevant information in sequential teams,” Automatica, vol. 61, pp. 178–191, Nov 2015.
Other refereed contributions

148. J. Arabneydi* and A. Mahajan, “Team-optimal solution of finite number of meanfield coupled LQG subsys- tems,” 54th IEEE Conference on Decision and Control (CDC), Kyoto, Japan, Dec 15–18, 2015 (6 pages).
149. C. Cui* and A. Mahajan, “On computing optimal thresholds in decentralized sequential hypothesis testing,” 54th IEEE Conference on Decision and Control (CDC), Kyoto, Japan, Dec 15–18, 2015 (5 pages).
150. J. Chakravorty* and A. Mahajan, “When to communicate information in twoplayer teams?” Sixth Workshop on Dynamic Games in Management Science, Montreal, QC, Oct 22-23, 2015.
151. J. Chakravorty** and A. Mahajan, “Remote estimation of Markov processes under communication constraints,” Forth Rutgers Applied Probability Conference, Piscataway, NJ, Oct 2-3, 2015.
152. J. Arabneydi* and A. Mahajan, “Reinforcement learning in decentralized stochastic control systems with partial history sharing,” American Control Conference (ACC), pp. 5449–5456, Chicago, IL, Jul 1-3, 2015.
153. S. Li*, A. Khisti, and A. Mahajan, “Structure of optimal privacy preserving policies in smart-metered systems using a rechargeable battery,” IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC), pp. 375–379, Stockholm, Sweden, Jun 28–Jul 1, 2015. (invited)

154. J. Chakravorty* and A. Mahajan, “Distortion-transmission trade-off in real-time transmission of Gauss- Markov sources,” IEEE International Symposium of Information Theory (ISIT), pp. 1–5, Hong Kong, China, Jun 14–19, 2015.
155. J. Arabneydi* and A. Mahajan, “Mean-field teams,” 7th International Conference on Discrete Models of Complex Systems, Toronto, ON, June 17–19, 2015.
156. J. Arabneydi* and A. Mahajan, “Finite-state approximations of POMDPs,” Joint International Meeting Canadian Operational Research Society (CORS) Institute for Operations Research and the Management Sciences (IN- FORMS), Montreal, QC, June 14–17, 2015.
157. J. Arabneydi* and A. Mahajan, “Reinforcement learning in decentralized stochastic control systems with partial history sharing,” Conference on Reinforcement Learning and Decision Making (RLDM), pp. 193–197, Edmonton, Alberta, Canada, Jun 7–10, 2015. (Selected for oral presentation. Fewer than 15% of accepted submissions were awarded an oral presentation.)
158. P. Prokopiou*, P.E. Caines, and A. Mahajan, “An estimation based allocation rule with super-linear regret and finite lock-on time for time-dependent multi-armed bandit processes,” Canadian Conference on Electrical and Computer Engineering (CCECE), pp. 1299–1306, Halifax, NS, Canada, May 3-6, 2015.
159. J. Chakravorty* and A. Mahajan, “Distortion-transmission trade-off in real-time transmission of Markov sources,” IEEE Information Theory Workshop (ITW), pp. 1–5, Jerusalem, Israel, Apr 26–May 1, 2015. (invited)
160. J. Arabneydi* and A. Mahajan, “Team optimal control of coupled major-minor subsystems with mean-field sharing,” IEEE Indian Control Conference, pp. 95–100, Chennai, India, Jan 5-7, 2015.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015
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Non-refereed contributions
161. S. Li*, A. Khisti, and A. Mahajan, “Privacy-optimal strategies for smart metering systems with a rechargeable battery,” Les Cahiers du GERAD, no. G-2015-132, Dec 2015.
162. J. Arabneydi* and A. Mahajan, “Linear Quadratic Mean-Field Teams,” Les Cahiers du GERAD, no. G-2015-121, Nov 2015.
163. C. Cui* and A. Mahajan, “On computing optimal thresholds in decentralized sequential hypothesis testing,” Les Cahiers du GERAD, no. G-2015-67, July 2015.
164. J. Chakravorty* and A. Mahajan, “Fundamental limits of remote estimation of Markov processes under communication constraints,” Les Cahiers du GERAD, no. G-2015-53, May 2015.
165. C. Ma*, B. Meyer, A. Mahajan, "Multi-armed bandits for MPSoC design for reliability", McGill Engineering Research Symposium (MERS), Oct, 2015.
All other publications, including those from research that you supervised
166. M. Mannan*, “Finite-state approximation for a class of POMDPs and comparison of reinforcement learning algorithms for managing energy storage in renewable generation,” MEng Thesis, April 2015.
167. C. Cui*, “On computing optimal thresholds for sequential hypothesis testing,”

MEng Thesis, August 2015.

Michalska, Hannah

168. Farkhatdinov, I., Michalska, H., Hayward, V., "Idiothetic verticality estimation through the head stabilization strategy," 17 pages, to appear in International Journal of Humanoid Robotics;
https://www.academia.edu/21671916/IDIOTHETIC_VERTICALITY_ESTIMATION_THROUGH_THE_HEAD_STABILIZATION_STRATEGY

169. Michalska, H., "Sensitivity of retarded functional differential Equations to Banach space parameters," 18 pages; Journal of Applied Mathematics;
https://www.academia.edu/21671722/SENSITIVITY_OF_RETARDED_FUNCTIONAL_DIFFERENTIAL_EQUATIONS_TO_BANACH_SPACE_PARAMETERS

170. Farkhatdinov, I., Michalska, H, Hayward, V., Berthoz, A., "Gravito-inertial ambiguity during locomotion can be resolved through head stabilization," 18 pages; Biocybernetics and Biomedical Engineering;
https://www.academia.edu/21671713/Gravito-Inertial_Ambiguity_During_Locomotion_Can_Be_Resolved_Through_Head_Stabilization

171. Castanos, F., Gromov, D., Michalska, H., Hayward, V. "Discrete time models for implicit Port-Hamiltonian systems," 27 pages, International Journal of Control;
https://www.academia.edu/21671652/DISCRETE_TIME_MODELS_FOR_IMPLICIT_PORT-HAMILTONIAN_SYSTEMS

McGill Centre for Intelligent Machines (CIM) Annual Report 2015

172. Platkiewicz, J., Michalska, H., Hayward, V., "Probabilistic nonlinear models explain the size-weight, the moon, and other illusions," 15 pages, Journal of Perception;
https://www.academia.edu/21671880/Probabilistic_Nonlinear_Models_Explain_the_Size-Weight_the_Moon_and_Other_Illusions

Nahon, Meyer

Articles in refereed publications

173. M. Al-Solihat and M. Nahon, 2015, "Nonlinear Hydrostatic Restoring of Floating Platforms," ASME Journal of Computational and Nonlinear Mechanics, Vol 10, No. 4, pp. 041005-1-11.

174. W. Khan and M. Nahon, 2015, "Development and Validation of a Propeller Slipstream Model for Small Unmanned Aerial Vehicles," AIAA Journal of Aircraft, Vol. 52, No.6, pp. 1985-1994.

175. K. Yagi, N. Hori and M. Nahon, 2015, "Experimental Verification of a Practical Digital Driver with Switched Gain-Tuning for Five-Phase Stepping-Motors," Transactions of the CSME, Vol. 39, No. 2, pp. 239-252.

176. N. Dhanji, M. Nahon and E. Dupuis, 2015, "Comparative Study of Aerial Platforms for Mars Exploration," Journal of the British Interplanetary Society, Vol. 68, 15 pages.

177. W. Khan and M. Nahon, 2015, "A Propeller Model for General Forward Flight Conditions," International Journal of Intelligent Unmanned Systems, Vol. 3, No. 2/3, pp. 72-92.

Other refereed contributions
178. N.K. Tran, E. Bulka and M. Nahon, 2015, “Quadrotor Control in a Wind Field,” International Conference on Unmanned Aircraft Systems (ICUAS’15), Denver, CO, June 9-12.
179. W. Khan and M. Nahon, 2015, “Real-Time Modeling of Agile Fixed-Wing UAV Aerodynamics,” International Conference on Unmanned Aircraft Systems (ICUAS’15), Denver, CO, June 9-12.
All other publications, including those from research that you supervised
180. N.K. Tran, “Modeling and Control of a Quadrotor in a Wind Field,” MEng Thesis, Department of Mechanical Engineering, McGill University, November 2015.

Pineau, Joelle

Publications in refereed journals
181. M. Ghavamzadeh, S. Mannor, J. Pineau, A. Tamar. “Bayesian Reinforcement Learning: A Survey.” Foundations and Trends in Machine Learning. Vol. 8: No. 5-6. pp 359-483. 2015.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015
42
Publications in refereed conference proceedings
182. A. Barreto, R. Beirigo, J. Pineau, D. Precup. “An Expectation-Maximization Algorithm to Compute a Stochastic Factorization.” International Joint Conference on Artificial Intelligence (IJCAI). 2015. 8 pages.
183. H. Ma, J. Pineau, “Information Gathering and Reward Exploitation of Subgoals for POMDPs.” Association for the Advancement of Artificial Intelligence (AAAI). 2015. 7 pages.
184. B. Wang, J. Pineau, “Online Boosting Algorithms for Anytime Transfer and Multitask Learning.” Association for the Advancement of Artificial Intelligence (AAAI). 2015. 7 pages.
185. A. Leigh, J. Pineau, N. Olmedo, H. Zhang. “Person Tracking and Following with 2D Laser Scanners." International Conference on Robotics and Automation (ICRA). 2015. 8 pages.
186. H.K. Yuen, J. Pineau, P. Archambault. “Automatically characterizing driving activities onboard smart wheelchairs from accelerometer data.” IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2015. 8 pages.
187. R. Lowe, N. Pow, I. Serban, J. Pineau. “The Ubuntu Dialogue Corpus: A Large Dataset for Research in Unstructured Multi-Turn Dialogue Systems.” Annual Meeting on Discourse and Dialogue (SIGdial). 2015. 10 pages.
188. P.-L. Bacon, E. Bengio, J. Pineau, D. Precup. “Conditional computation in neural networks using a decision-theoretic approach.” Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM). 2015. 5 pages.
189. A. Durand, J. Pineau. “Cancer Treatment Optimization Using Gaussian Processes.” Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM). 2015. 5 pages.
Other publications
190. I.V. Serban, R. Lowe, L. Charlin, J. Pineau. “A Survey of Available Corpora for

Building Data-Driven Dialogue Systems." arXiv: 1512.05742. 2015. 46 pages. (Under review at Dialogue and Discourse).
191. J. Pineau, P.-L. Bacon. "Analyzing Open Data from the City of Montreal." International Conference on Machine Learning (ICML) Workshop on Mining Urban Data. 2015. 6 pages.
192. R. Lowe, N. Pow, I.V. Serban. L. Charlin, J. Pineau. "Incorporating Unstructured Textual Knowledge Sources into Neural Dialogue Systems." NIPS 2015 Workshop on Machine learning for SLU & Interaction Workshop. 7 pages.
193. I.V. Serban, J. Pineau. "Text-Based Speaker Identification for Multi-Participant Open-Domain Dialogue Systems." NIPS 2015 Workshop on Machine learning for SLU & Interaction Workshop. 7 pages.
194. B. Wang, J. Pineau. "Multitask Generalized Eigenvalue Program." NIPS 2015 Workshop on Transfer and Multi-Task Learning: Trends and New Perspectives. 5 pages.
195. A. Durand, J. Pineau. "Treatment Allocation as Contextual Bandit." NIPS 2015 Workshop on Machine Learning in Healthcare. 2015. 3 pages.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015

196. E. Bengio, J. Pineau, P.-L. Bacon, D. Precup. "Conditional computation in neural networks for faster models." NIPS 2015 Workshop on Deep Reinforcement Learning. 12 pages.

Sharf, Inna

Articles in refereed publications
197. Tribou, M.J., Harmat, A., Wang, D.W.L., Sharf, I. and S. L. Waslander, "Multi-Camera Parallel Tracking and Mapping with Non-overlapping Fields of View," International Journal of Robotics Research, Vol. 34, pp. 1480-1500, 2015.
198. Zhang, F., Sharf, I., Misra, A.K. and Huang, P. "On-line Estimation of Inertia Parameters of Space Debris for its Tether-assisted Removal," Acta Astronautica, Vol. 107, pp. 150-162, 2015.
Other refereed contributions
199. E.M. Botta, I. Sharf, M. Teichmann, and A.K. Misra. "On the Simulation of Tether-Nets for Space Debris Capture with Vortex Dynamics," 66th International Astronautical Congress, Jerusalem, Israel, October 2015. IAC-15-A6.5.6.
200. Persson, S.M. and I. Sharf, "Ground-based Experiments towards the Interception of Non-cooperative Space Debris with a Robotic Manipulator," Proc. IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2015, Hamburg, Germany, Sept. 28 - Oct. 2, 2015.
Non-refereed contributions
201. E.M. Botta, I. Sharf, and A.K. Misra. "On the Modeling and Simulation of Tether-Nets for Space Debris Capture," 25th AAS/AIAA Space Flight Mechanics Meeting, Williamsburg, VA, January 2015. AAS 15-260.
All other publications, including those from research that you supervised
202. Pierre-Yves Breches, "Dynamics Modeling and State Feedback Control of a Lighter-than-air Cubic Blimp," M.Eng. Thesis, Mechanical Engineering, McGill

University, 2015.
203. Mikael Persson, “Autonomous and Safe Capture of Large Space Debris with a Robotic Manipulator,” PhD dissertation, Mechanical Engineering, McGill University, 2015.
Contributions to industrially relevant research and development
204. Technical Note 5, “Rigidization and Berthing: New Tumbling Parameters of Envisat,” submitted to Astrium/AIRBUS DS as part of fulfillment of service contract “Reactionless Robotic Operations on a Free-floating Platform,” March 2015.
McGill Centre for Intelligent Machines (CIM) Annual Report 2015
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Siddiqi, Kaleem

Publications in refereed journals
205. Emmanuel Piuze, Jon Sporring, Kaleem Siddiqi. “Maurer-Cartan Forms for Fields on Surfaces: Application to Heart Fiber Geometry.” IEEE Transactions on Pattern Analysis and Machine Intelligence. 37(12): pp. 2492-2504 (2015)
206. Morteza Rezanejad, Kaleem Siddiqi. “View Sphere Partitioning via Flux Graphs Boosts Recognition from Sparse Views.” Frontiers in ICT: Computer Image Analysis. 2(24). doi=10.3389/fict.2015.00024
Publications in refereed conference proceedings
207. Emmanuel Piuze, Jon Sporring, Kaleem Siddiqi. “Moving Frames for Heart Fiber Reconstruction.” In International Conference on Information Processing in Medical Imaging (IPMI), Isle of Skye, Scotland, July 2015: pp. 527-539
208. Morteza Rezanejad, Babak Samari, Ioannis M. Rekleitis. Kaleem Siddiqi, Gregory Dudek. “Robust environment mapping using flux skeletons.” In International Conference on Intelligent Robots and Systems (IROS), Hamburg, September 2015: pp. 5700-5705
209. Pierre Ablin, Kaleem Siddiqi. “Detecting Myocardial Infarction using Medial Surfaces.” Statistical Atlases and Computational Models of the Heart (STACOM) – Statistical Shape Modeling Challenge (Munich, Germany), October 2015, LNCS Vol. 9534, pp. 146--153.
210. Kuldeep Kumar, Christian Desrosiers, Kaleem Siddiqi. “Brain Fiber Clustering Using Non-negative Kernelized Matching Pursuit.” In Machine Learning in Medical Imaging (MLMI) (Munich, Germany), October 2015, LNCS Vol. 9352, pp. 144- 152.