2019

Centre for Intelligent Machines

Annual Report

McGill

A message from the Centre Director

Derek Nowrouzezahrai

The Centre for Intelligent Machines celebrates another exciting year, with 2019 bringing on the end of Professor James Clark's second successful term as the Director. Professor Frank Ferrie very graciously and professionally served as Interim Director for the remainder of the calendar year, before my official appointment as CIM Director. I am very much indebted to both Professors Clark and Ferrie for the guidance they furnished me prior to my nomination, and my Directorship will most certainly reap the rewards sowed by my predecessors.

I am excited, now more than ever, about how CIM will continue to grow and evolve. We will continue CIM's tradition of building atop the strengths of its diverse, multi-disciplinary community of PIs, Associate Members, HQP, Research Associates and Staff Members. Here, we will work towards growing the Centre's capacity to support our strategic areas of research, providing PIs and trainees with the administrative and technical resources needed to augment their contributions to the Centre's research and training initiatives. CIM will pursue new endeavors targeted in supporting long term financial security needed to support these services; this will include, but is not limited to, scaling-up membership in our Industrial Liaison Program, exploring outward-facing training opportunities, and pursuing a completely restructured infrastructure funding drive.

Throughout these changes, CIM's ethos will remain at the forefront of every strategic decision. Indeed, the synergy of our combined interests and expertise in the domains of applied science and engineering — evidenced in part in our unique, multi-faculty and multi-departmental core membership — affords opportunities that bridge between theoretical and applied research and development. The growing ubiquity of our core competences across other faculties serves as evidence of another one of CIM's important roles on campus: liaising with members of the broader McGill community to explore new ways of leveraging our expert knowledge to solve far-reaching and important societal problems. As such, we will continue to grow our inter-faculty collaborations — both through centre membership and strategic alliances.

I am keen to report on our progress towards this growth as we evolve CIM into this new decade.

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

For more than three 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. Intelligent systems and machines are capable of adapting their behaviour by sensing and interpreting their environment, making decisions and plans, and then carrying out those plans using physical actions. The members of CIM seek to advance the state of knowledge in such domains as – robotics, artificial intelligence, computer vision, medical imaging, haptics, systems and control, computer animation and machine and reinforcement learning.

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 2019 the centre boasted a complement more than 300 graduate students, post-docs and undergraduate students, as well as visiting scholars, research assistants and associates from various disciplines.

21
Professors

83
PhD
Students

86
Masters

17
Postdocs

17
Associates

112
Undergrads

Centre Governance

Day-to-day operation of the Centre's activities, management of its finances, allocation of space and other resources, are carried out by the Centre's Director, assisted by the Centre support staff.

The Centre is advised by the Centre's Board, which meets yearly to review the Centre's activities and budget, and to provide guidance on strategic planning.

2019 Board Members

Derek Nowrouzezahrai — Centre Director, Board Chair

James Nicell — Dean, Faculty of Engineering

Bruce Lennox — Dean, Faculty of Science

Chris Manfredi — Provost and Vice Principal, Academic

Martha Crago — Vice Principal, Research and Innovation

Greg Dudek — Centre Member

Frank Ferrie — Centre Member

Kaleem Siddiqi — Alternate Centre Member

Pierre Breton — External Member, Executive Vice President, KWI Polymers

Mohamad Afsari — Graduate Student

CIM Director Derek Nowrouzezahrai winning the CIM Tetris Competition at the Annual Team building event

Centre Membership

Full Members

Derek Nowrouzezahrai

Centre Director
Associate Professor

Department of Electrical and Computer Engineering

Computer Graphics

Jorge Angeles

Professor

Department of Mechanical Engineering

Robotics and Mechtronics

Tal Arbel

Professor

Department of Electrical and Computer Engineering

Computer Vision and Medical Image Analysis

Benoit Boulet

Professor
Associate Dean (Research & Innovation)

Department of Electrical and Computer Engineering

Systems and Control

Peter Caines

Distinguished James McGill Professor

Department of Electrical and Computer Engineering

Systems and Control

James Clark

Professor

Department of Electrical and Computer Engineering

Computer Vision

Jeremy Cooperstock

Professor

Department of Electrical and Computer Engineering

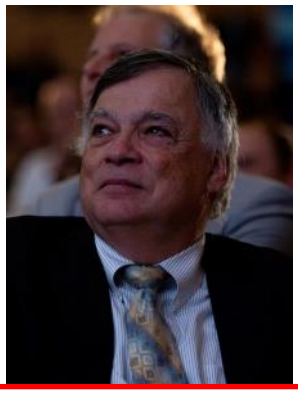
Human-Computer Interaction

Gregory Dudek

James McGill Professor

School of Computer Science

Robotics and Computer Vision



Frank Ferrie

Professor

Department of Electrical and Computer Engineering

Computer Vision

Jozsef Kovecses

Associate Professor

Department of Mechanical Engineering

Robotics and Aerospace Systems

Paul Kry

Associate Professor

School of Computer Science

Computer Graphics

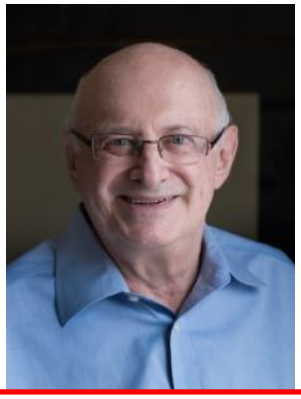
Michael Langer

Associate Professor

School of Computer Science

Computer Vision

> *"Dr. Pineau's leadership in the innovative application of Artificial Intelligence and machine learning to personalized and robot-assisted health care is shaping the future of the field, and creating a nexus of socially responsible AI research activity at McGill, in Montreal and beyond."*
> (McGill Reporter, May 13, 2019)



Martin Levine

Professor

Department of Electrical and Computer Engineering

Computer Vision

Aditya Mahajan

Associate Professor

Department of Electrical and Computer Engineering

Systems and Control

David Meger

Assistant Professor

School of Computer Science

Robotics and Computer Vision

Hannah Michalska

Associate Professor

Department of Electrical and Computer Engineering

Systems and Control

Meyer Nahon

Professor
Chair, Mechanical Eng.

Department of Mechanical Engineering

Robotics and Aerospace Systems

Joelle Pineau

Associate Professor
William Dawson Scholar

School of Computer Science

Machine Learning

> *"This selection exemplifies the crucial contributions McGill's AI community has to make in this dynamic and competitive field"*
> [Upon selection of new CIFAR AI Chairs including Prof. Tal Arbel] (McGill Reporter, Dec 9, 2019)

Inna Sharf

Professor

Department of Mechanical Engineering

Robotics and Aerospace Systems

Kaleem Siddiqi

Professor

School of Computer Science

Computer Vision and Medical Image Analysis

Paul Zsombor-Murray

Associate Professor

Department of Mechanical Engineering

Robotic Mechanisms

Centre Support Staff

Centre Manager:

Marlene Gray

Computing Systems Manager:

Jan Binder

Administrator:

Chelsea Rogers

Computing Systems Support:

Nick Wilson

Centre staff members Chelsea and Nick compete in a Tetris tournament at the Annual Team Building event

Centre Membership

Associate Members

Adamchuk, Viacheslav – Associate Professor, Bioresource Engineering, McGill University

Armandfard, Narges – Assistant Professor, Electrical & Computer 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, Biomedical Engineering, McGill University

Dimitrakopoulos, Roussos – Professor, Mining Engineering, McGill University

Forbes, James Richard – Assistant Professor, Mechanical Engineering, McGill University

Gross, Warren – Professor and Chair, Electrical & Computer 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, School of Computer Science, McGill University

Misra, Arun – Thomas Workman Professor, Mechanical Engineering, McGill University

Mongrain, Rosaire – Associate Professor, Mechanical Engineering, McGill University

Panangaden, Prakash – Professor, School of Computer Science, McGill University

Pike, Bruce – Professor, Faculty of Medicine, University of Calgary

Precup, Doina – Associate Professor, School of Computer Science, McGill University

In Memoriam

Sam Musallam (1967-2019) - Associate Professor

Electrical and Computer Engineering, McGill University

Visitors to the Centre – 2019

The Centre regularly hosts researchers on long-term (one month or more) visits. These include professors from other Universities on sabbatical leave research exchange students and research collaborators from industry.

Yaojun Wang	Zhejiang Sci-Tech University	Hosted by Jorge Angeles
Shu-Jun Liu	Sichuan University	Hosted by Peter Caines
Amirmasoud Ghasemi Toudeshki	Simon Fraser University	Hosted by Gregory Dudek
Christopher Salmon	MUHC Research Institute	Hosted by Kaleem Siddiqi
Anurag Roy		Hosted by Kaleem Siddiqi
Gaspard Beugnot	Ecole Polytechnique Palaiseau	Hosted by Kaleem Siddiqi
Christopher Savarin		Hosted by Jorge Angeles
Yusuf Can Samiloglu		Hosted by Jorge Angeles
Lilu Tang		Hosted by Jeremy Cooperstock
Kotaro Hirota		Hosted by Jozsef Kovecses
Yanli Liu		Hosted by Jorge Angeles
Chuanyang Li	Harbin Institute of Technology	Hosted by Jorge Angeles

Prof. Pineau receiving the Governor General's innovation award from Julie Payette, former CIM-ite in May 2019

Prof. Dudek hosting ICRA 2019 in Montreal in May

Honours and Distinctions

Celebrating Excellence

The outstanding contributions made by the Centre's researchers are frequently recognized through awards and other distinctions. 2019 was no exception to this, with many honours bestowed on our members.

Prof. Tal Arbel was named a Canada CIFAR AI Chair Recipient, MILA. Research Chair whose aim is to recruit and retain in Canada some of the world's leading researchers in AI and provide them with long-term, dedicated research funding to support their research programs, and help them train the next generation of AI leaders. Awarded by CIFAR, Pan Canadian AI Conference, Vancouver, Dec. 9, 2019.

Prof. Arbel also received Christophe Pierre Award for Research Excellence. Award that recognizes excellence in research by academic staff in the Faculty of Engineering. Awarded by the Faculty of Engineering, McGill, May 16, 2019.

Along with students, she was the recipient of a Best Paper Award, R. Mehta, T. Christinck, T. Nair, P. Lemaitre, D.L. Arnold and T. Arbel, "Propagating Uncertainty Across Cascaded Medical Imaging Tasks For Improved Deep Learning Inference". First International Workshop on Uncertainty for Safe Utilization of Machine Learning in Medical Imaging (UNSURE 2019), held in conjunction with the 22nd International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2019). Awarded at the UNSURE workshop at MICCAI 2019, Shenzhen, China, October 17, 2019.

Prof. Paul Kry was recognized for three years of service on SIGGRAPH EXECUTIVE COMMITTEE.

Prof. Peter Caines received a Distinguished James McGill Professor Award (NSERC-based)

Prof. Caines was also Elected Fellow of the International Federation of Automatic Control (IFAC)

Prof. Caines also received a citation: "For contributions to system identification and adaptive control, and the creation of mean field game theory"

Prof. Derek Nowrouzezahrai was awarded Best Student Paper Award for "Fast Non-uniform Radiance Probe Placement" published and presented at the ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games in June 2019.

Prof. Nowrouzezahrai also received a Best Presentation Award for "Dynamic Diffuse Global Illumination with Ray-traced Irradiance Fields" presented at the ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games in June 2019.

Prof. Nowrouzezahrai also received a Best Paper Award for "A Frequency Analysis and Dual Hierarchy for Efficient Rendering of Subsurface Scattering" presented and published at the Graphics Interface Conference in Nov. 2019.

Prof. Gregory Dudek was the conference Chair of the 2019 International Conference on Robotics and Automation (ICRA) in Montreal.

Prof. Joelle Pineau was the recipient of the Governor General's Innovation Award, presented at Rideau Hall on May 29th, 2019. It was presented by Governor General Julie Payette, who is also a former CIM-ite.

Prof. Pineau was also the recipient of a CIFAR Canadian AI chair (CCAI)

Bruno Belzile, postdoctoral researcher under the co-supervision of Prof. Jorge Angeles and Prof. Jozsef Kovecses, received an award for the Best Research Paper in Robotics and Mechatronics at IFToMM World Congress on Mechanism and Machine Science 2019, held in Krakow, Poland, 30 June – 4 July 2019.

Prof. Kaleem Siddiqi received a Discovery Accelerator Supplement.

Prof. Arbel receiving the Christophe Pierre Award for Research Excellence

Prof. Arbel and other CIFAR AI Chairs in Dec 2019

Industrial Affiliates Program

Connecting with Industry

The Industrial Affiliates Program provides companies with access to students for recruiting purposes as well as a way to keep up-to-date on the exciting research going on in the Centre.

imagia

Industrial Affiliates – 2019

C2RO

Element AI

Envision

Huawei

Imagia

SimActive

SportlogiQ

PhD student Amir Haji-Abolhassani, supervised by Prof. Frank Ferrie, representing IAP member C2RO at the Student Research Showcase

Mehrsan Javan, former PhD student supervised by Prof. Martin Levine, current CTO and co-founder of Sportlogiq, speaks to the audience at the showcase

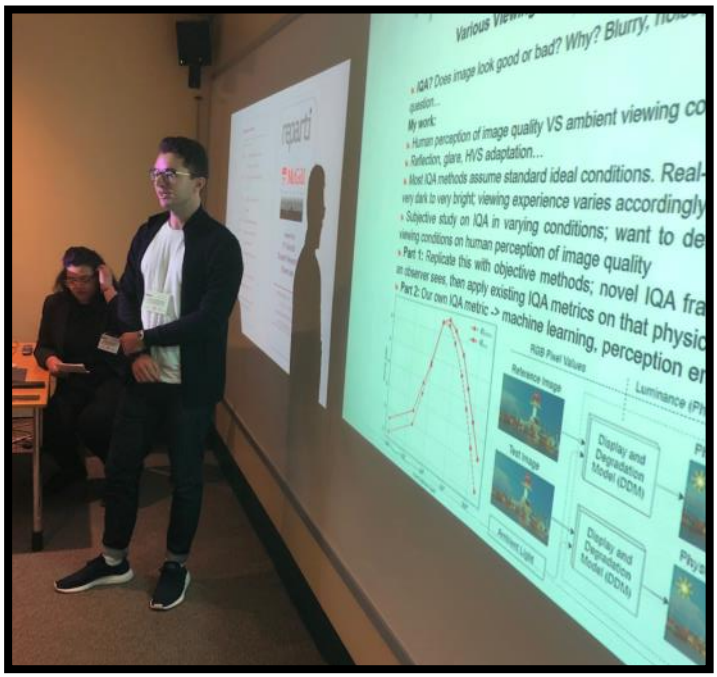
Centre Activities

Student Research Showcase

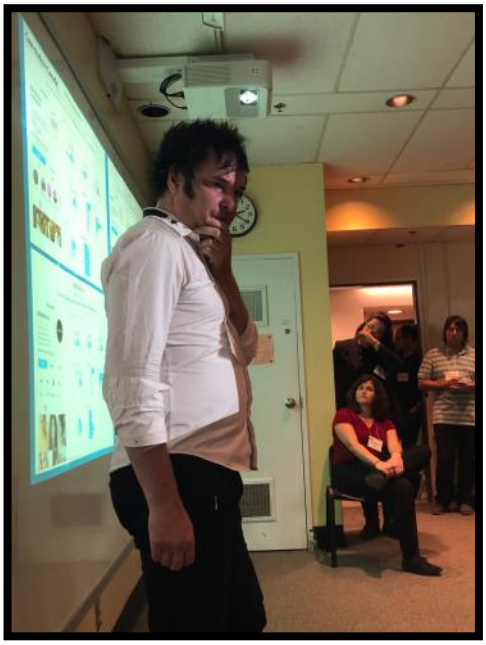
The fifth annual Student research Showcase was held on September 26th, 2019. The event featured presentations by several industrial affiliates, as well as short one-slide summaries of student research.

The event took place during McGill homecoming and several alumni participated. Over 20 students presented their research and many more attended as spectators. Company representatives, including some CIM alumni, from Huawei, Envision.AI, Element AI and SportLogiq gave presentations on their companies and the paths that led them to their careers.

After the presentations, attendees were invited to enjoy wine and cheese while they discussed the presentations. It was an excellent networking opportunity and all present gave positive feedback.



Andrei Chubarau , supervised by Prof. James Clark, presenting his research



Thomas Jelonek, former PhD student supervised by Prof. Frank Ferrie, presenting his work at envision.ai

Audience members watching the presentations in the Zames room

Visitors exploring a haptic setup during the ICRA conference tour

Centre Activities

Visitors

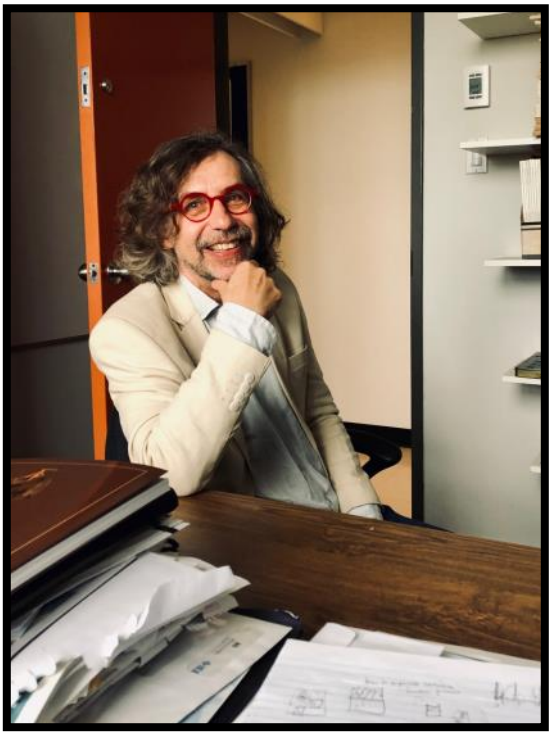
The high reputation of the research and researchers of the Centre attracts a regular stream of visitors interested in knowing more about our work.

Visitors include academic researchers, government officials, industry representatives and high school students seeking an inside look at scientific and engineering research projects.

This year the International Conference on Robotics and Automation (ICRA) was held in Montreal on May 20-24, 2019. CIM member Prof. Gregory Dudek hosted this conference and participants were invited to tour CIM and take a look at the research taking place in our labs.

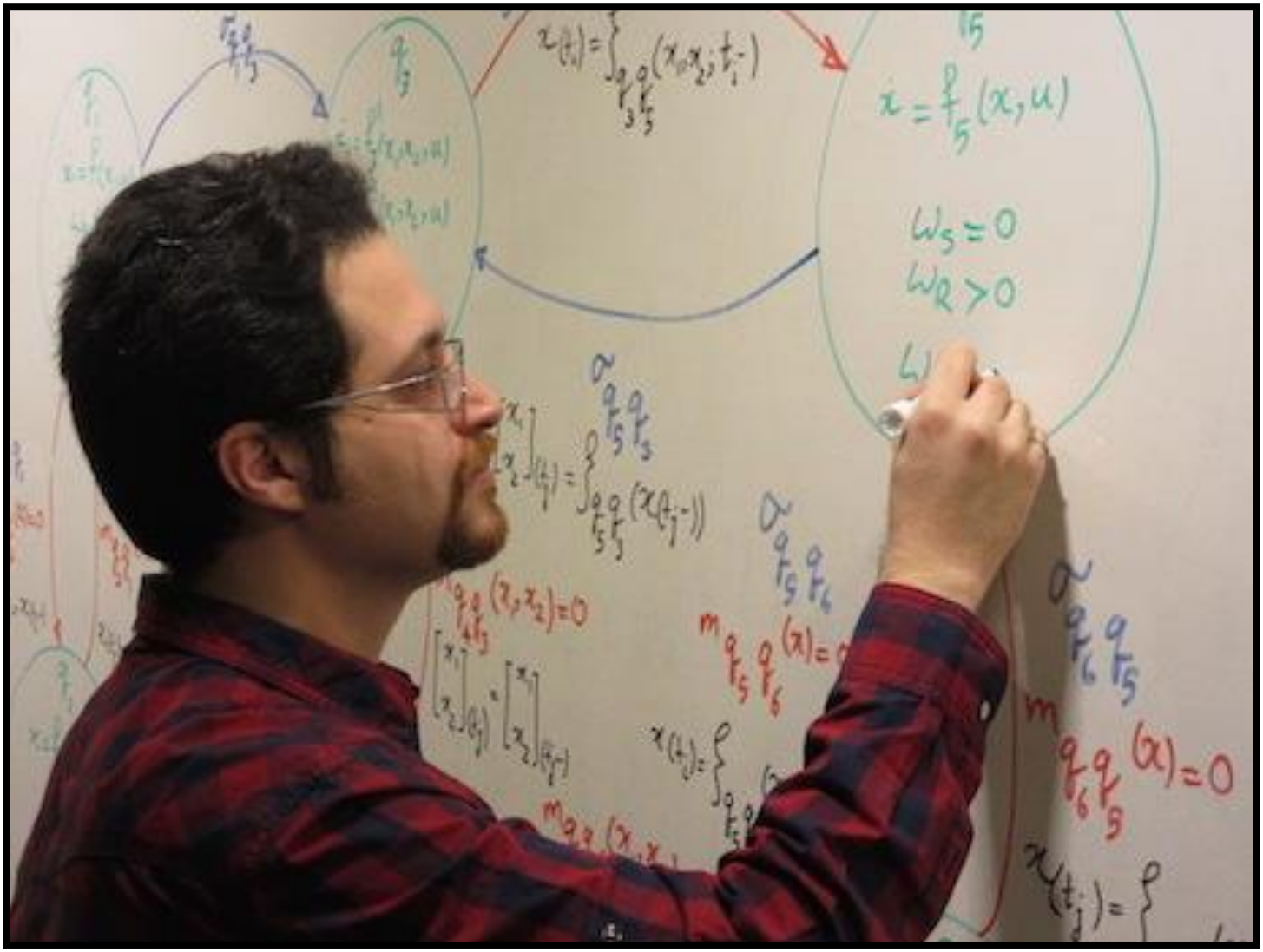
Prof. Dudek introducing a speaker at ICRA

CIM student demonstrating his research project to visitors



Vincent Hayward, former CIM director, returns for a visit

Visitors explore CIM labs



Ali Pakniyat lecturing in the Zames Seminar Room

Centre Activities

Seminars

A vigorous exchange of ideas is the lifeblood of any active research Centre. Spearheaded by the long-running Informal Systems Seminar series, the Centre regularly hosts talks by eminent scholars from around the world.

Speakers – 2019

Levon Nurbekyan
McGill University

Manfred L. Husty
University Innsbruck

Shujun Liu
Sichaun University

Hugh H.T. Liu
University of Toronto

Murat Arcak
University of California, Berkeley

Josh Taylor
University of Toronto

Francesca Parise
MIT

Mohammad Afshari
McGill University

Karthik Kashinath
NSERC

Riccardo Bonalli
Stanford University

Mauro Salazar
Stanford University

Donald Dansereau
University of Sydney

Ye Zhao
Georgia Institute of Technology

Eric Heitz
United Technologies

Steven Fraser
Innoxec (Innovation Executive Services)

M. Alex O. Vasilescu
University of California Los Angeles

Ali Pakniyat
University of Michigan

Meir N. Pachter
Air Force Institute of Technology

Romeo Ortega
CNRS-CentraleSupélec

Behrouz Touri
University of California San Diego

Ioannis Rekleitis
University of South Carolina

Ryan J. Kinnear
University of Waterloo

Matthew Harker
University of Leoben

David Levanony
Ben Gurion University

Sylvain Bouix
Brigham and Women's Hospital, Harvard Medical School

Morteza Rezanejad
McGill University

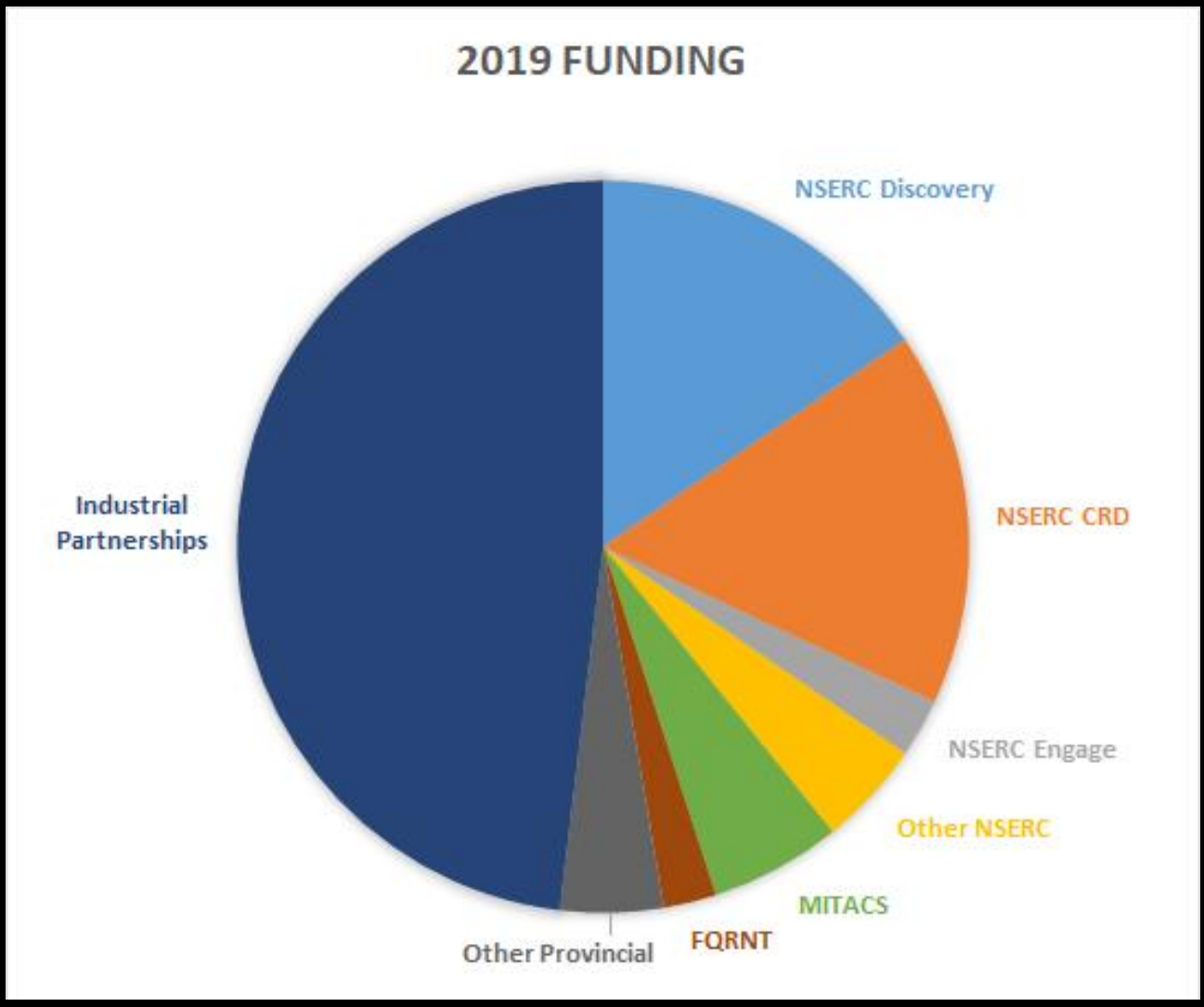
Jean-Francois Chamberland
Texas A&M University

Ehsan Hashemi
University of Waterloo

Fania Mokhayeri
Ecole de technologie superieure

Annual Research Funding

Statistically Speaking



Research Funding

Fuel for Innovation

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).

In 2019 the Centre's research funding was buttressed by two large inter-university collaborative programs - the FRQNT-funded Regroupement REPARTI and the NSERC funded Canadian Field Robotics Network.

Details on these cornerstone programs are provided over the next few pages.

REPARTI

Systèmes cyberphysiques et intelligence machine matérialisée

The regroupement REPARTI (April 2019-March 2025) is a $2.9M inter-institutional, interdisciplinary collaborative venture comprised of 6 Quebec institutions, 50 members and over 400 students and post-doctoral researchers. The McGill node of REPARTI is represented by 17 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, École Polytechnique, Université de Montréal, 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 has been renewed twice, in 2013 and 2019, to continue a long tradition of excellence in research.

Clement Gosselin kicking off the 2019 REPARTI Workshop

NCRN

NSERC Canadian Robotics Network

The NCRN is a Canada-wide network spanning eight universities and nine industrial partners, three government agencies and five international partners.

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 NCRN supports the work of eleven researchers from eight different universities. It connects the academic participants with nine industrial partners and three 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 NCRN primarily provides direct support for students, thereby training highly qualified new researchers, engineers and technicians able to work in robotics-related industry.

The NCRN network management is hosted by McGill and CIM, with CIM member Greg Dudek serving as scientific director. CIM members Inna Sharf and David Meger are also part of the NCRN.

The NCRN was preceded by the NCFRN, which was a 5-year program that started on June 30, 2012 and ended on June 29, 2018.

Two robots explore the coral reef during NCRN research activities

Funding Breakdown by Source

Collaborative Programs

Funding Source	Start Date	End Date	Grant Total	CIM 2019
REPARTI (FQRNT Regroupement)	April 2019	March 2025	$ 2,880,000	$ 158,000
NSERC Canadian Robotics Network	June 2018	June 2024	$ 8,727,000	$ 270,000

Grant	Total Funding	2019 Amount
NSERC Discovery	$ 3,645,000	$ 746,167
NSERC CRD	$ 2,252,666	$ 799,283
NSERC Engage	$ 125,000	$ 125,000
Other NSERC	$ 450,000	$ 225,000
MITACS	$ 420,528	$ 281,128
FQRNT	$ 338,736	$ 112,912
Other Provincial	$ 500,881	$ 219,841
Industrial Partnerships	$ 7,164,934	$ 2,326,002
Total	**$ 14,897,745**	**$ 4,835,332**

Publications – 2019

Angeles, Jorge

Wang, Y., Belzile, B., Angeles, J. and Li, Q., 2019, "The modeling of redundantly actuated mechanical systems," ASME Journal of Mechanisms and Robotics, Vol. 11, Issue 6, pp. 061005-1--061005--10, DOI: 10.1115/1.4044540.

Bai, S., Li, X. and Angeles, J., 2019, "A review of spherical motion generation using either spherical parallel manipulators or spherical motors," Mechanism and Machine Theory, Vol. 140, pp. 377-388.

Stachel, H., Figliolini, G. and Angeles, J., 2019, "The logarithmic spiral and its spherical counterpart," Journal of Industrial Design and Engineering Graphics, Vol. 14, No. 1, pp. 91-98.

Wang, Y., Belzile, B., Angeles, J. and Li, Q., 2019, "Kinematic analysis and optimum design of a novel 2PUR-2RPU parallel robot," Mechanism and Machine Theory, Vol. 139, pp. 407-423.

Belzile, B. and Angeles, J., 2019, "Reflections Over the dual ring-Applications to kinematic synthesis," ASME Journal of Mechanical Design, Vol. 141, Issue 7, pp. 072302-1--072302-9, DOI: 10.1115/1.4043204.

Karimi Eskandary, P., Belzile, B. and Angeles, J., 2019, "Trajectory-planning and normalized-variable control for parallel pick-and-place robots," ASME Journal of Mechanisms and Robotics, Vol. 11, No. 3, pp. 031001-1--031001-8, DOI: 10.1115/1.4042631.

Shan, X., Angeles, J. and Forbes, J.R., 2019, "A novel capacitive sensing structure for simultaneous detectionof biaxial low-g acceleration in a commercial MEMS process," Microsystem Technologies, Technical Paper, DOI: 10.1007/s00542-019-04432-0.

Figliolini, G., Stachel, H. and Angeles, J., 2019, "Kinematic properties of planar and spherical logarithmic spirals: Applications to the synthesis of involute tooth profiles," Mechanism and Machine Theory, Vol. 136, pp. 14-26.

Morozov, A., Humphries, K., Rahman, T., Zou, T. and Angeles, J., 2019, "Drivetrain analysis and optimization of a two-speed class-4 electric delivery truck," SAE International Journal, Technical Paper 2019-01-5001, DOI:10.4271/2019-01-5001.

Javid, F., Shahmansouri, N., Angeles, J. and Mongrain, R., 2019, "Fatigue exhaustion of the mitral valve tissue," Biomechanics and Modeling in Mechanobiology, Vol. 18, No. 1, pp. 89-97.

Wang, Y., Belzile, B., Angeles, J. and Li, Q., 2019, "On the Modeling of Redundantly-actuated Mechanical Systems," ECCOMAS Multibody Dynamics Conference, Duisburg, Germany, July 15-18, pp. 172-179.

Belzile, B. and Angeles, J., 2019, "Heuristic Algorithm for Velocity Scheduling with a Schönflies-Motion Generator," Proc. 15th IFToMM World Congress, Krakow, Poland, June 30 - July 4, pp. 2411-2419. This paper won the Best Research Paper Award in Robotics and Mechatronics.

Yin, Z., Belzile, B., Angeles, J. and Forbes, J.R., 2019, "Elastodynamics of a parallel Schönflies-motion Generator," Proc. CCToMM Symposium on Mechanisms, Machines, and Mechatronics, May 16-17, Montreal, paper No. 21.

Shan, X., Angeles, J. and Forbes, J. R., 2019, Design, Fabrication, and Testing of a Monolithic Biaxial Architecture for MEMS Accelerometers, Technical Report TR-CIM-2019-15-10-01, Department of Mechanical Engineering and Centre for Intelligent Machines, McGill University, Montreal.

Wang, Y., Belzile, B., Angeles, J., Li, Q., 2019, Kinematic Analysis and Optimum Design of a Novel 2PUR-2RPU Parallel Robot, Technical Report TRCIM2019-28-01-01, Department of Mechanical Engineering and Centre for Intelligent Machines, McGill University, Montreal.

Arbel, Tal

N. K. Subbanna, D. Rajashekar, B. Cheng, G. Thomalla, J. Fiehler, T. Arbel and N. D. Forkert, "Stroke Lesion Segmentation in FLAIR MRI Datasets Using Customized Markov Random Fields", Frontiers in Neurology, Section Stroke, May 2019. https://doi.org/10.3389/fneur.2019.00541

R. Mehta, T. Christinck, T. Nair, P. Lemaitre, D.L. Arnold and T. Arbel, "Propagating Uncertainty Across Cascaded Medical Imaging Tasks For Improved Deep Learning Inference", in Proceedings of UNSURE 2019: First International Workshop on Uncertainty for Safe Utilization of Machine Learning in Medical Imaging, held in conjunction with the 22nd International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2019), Shenzhen, China, October 2019 (oral presentation: 1 of 3 papers accepted for oral presentation) BEST PAPER AWARD.

Kaur, P. Lemaitre, R. Mehta, N. Mohammadi-Sepahvand, D. Precup, D.L. Arnold and T. Arbel, "Improving Pathological Structure Segmentation Via Transfer Learning Across Diseases", in Proceedings of DART 2019: First International Workshop on Domain Adaptation and Representation Transfer, held in conjunction with the 22nd International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2019), Shenzhen, China, October 2019.

A. Tousignant, D. Precup, D.L. Arnold and T. Arbel, "Prediction of Progression in Multiple Sclerosis Patients using Deep Learning Analysis of MRI Data", in Proceedings of the 2nd International Conference on Medical Imaging with Deep Learning (MIDL 2019), London, U.K., July 2019. Proceedings of Machine Learning Research, Volume 120, pp. 483-492.

J. Durso-Finley, D.L. Arnold and T. Arbel, "Saliency Based Deep Neural Network for Automatic Detection of Gadolinium-Enhancing Multiple Sclerosis Lesions in Brain MRI", in MICCAI Brain-Lesion (Brain-Les) Workshop 2019, held in conjunction with the 22nd International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2019), Shenzhen, China, October 2019.

Boulet, Benoit

Wu, D., Wang, B., Precup, D., Boulet, B., "Multiple Kernel Learning based Transfer Regression for Electric Load Forecasting". IEEE Transactions on Smart Grid, 10.1109/TSG.2019.2933413, 2019.

Seal, S., Raissi Dehkordi, V., Boulet, B., C"oordination of Radiant Floor and Baseboard Heating Systems: Sequential and Simultaneous MPC Schemes". Science and Technology for the Built Environment, 1-25, 2019.

Azarnoush, H., Pazos, V., Vergnole, S., Boulet, B., Lamouche, G. "Intravascular optical coherence tomography to validate finite-element simulation of angioplasty balloon inflation". Physics in Medicine & Biology, 64-9, 2019.

Q. Dang, D. Wu, B. Boulet, "A Q-Learning-Based Charging Scheduling Scheme for Electric Vehicles" IEEE Transportation Electrification Conference , July 19-21, 2019, Novi, MI.

A. El Fathi, E. Palisaitis, B. Boulet, L. Legault, A. Haidar "An Unannounced Meal Detection Module for Artificial Pancreas Control Systems" American Control Conference, July 9-12, 2019, Philadelphia, NJ, pp. 4130-4135.

Reports of Invention:

R. Toukhtarian, M. Darabi, B. Boulet, Disclosure No. D2019-0132, March 2019 "Modelling, simulation and automatic control of the polymer extrusion process in extrusion blow molding"

B. Boulet, A. Medouar, Disclosure No. D2019-0171, November 2019 "Dual planetary based continuously variable transmission for electric vehicles"

Caines, Peter

P.E. Caines, D. Ho, and Q.Song. "The density evolution of the killed McKean–Vlasov process." Stochastics 2019, pp 1-16.

N. Sen and P.E. Caines, "Mean Field Game Theory for Agents with Individual-State Partial Observations", SIAM Journal on Control and Optimization, 57(3), June 2019, pp 2064-2091 math arXiv https://arxiv.org/abs/1708.07171

P.E. Caines and D. Levanony, "Stochastic ε–Optimal LQ Adaptation: An Alternating Controls Policy", SIAM Journal on Control and Optimization, 57(2), 2019, pp 1094 - 1126

P. E. Caines, "Mean Field Games", Encyclopedia of Systems and Control, Eds. T. Samad and J. Ballieul (updated), Springer-Verlag, London, 2019

D. Firoozi and P. E. Caines, "Belief Estimation by Agents in Major Minor LQG Mean Field Games". Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, December, 2019, pp. 1615-1622.

S. Gao and P. E. Caines, "Optimal and Approximate Solutions to Linear Quadratic Regulation of a Class of Graphon Dynamical Systems". Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, December, 2019 pp. 8359- 8365

S. Gao and P. E. Caines, "Spectral Representations of Graphons in Very Large Network Systems". Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, December, 2019, pp. 5068- 5075

P. E. Caines and M.Y. Huang, "Graphon Mean Field Games and the GMFG Equations: $epsilon$-Nash Equilibria". Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, December, 2019. pp. 286-292. (Also published as a "Cahier du GERAD": G-2019-81, November, 2019.)

R. Foguen, R.P. Malheme and P. E. Caines , "A Quantilized Mean Field Game Approach To Energy Pricing With Application To Fleets Of Plug-In Electric Vehicles". Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, December, 2019, pp. 299-304

Clark, James

Ra, K. and Clark, J.J., "Decoupled Hybrid 360DEG Panoramic Stereo Video". International Conference on 3D Vision (3DV), Quebec City, September 2019.

Corcoran, G. and Clark, J.J., "Traffic Risk Assessment: A Two-Stream Approach Using Dynamic-Attention", Computer and Robot Vision Conference (CRV), Kingston, Canada, May 2019.

Hu, G. and Clark, J.J., "Instance Segmentation based Semantic Matting for Compositing Applications", Computer and Robot Vision Conference (CRV), Kingston, Canada, May 2019.

Cooperstock, Jeremy

Blum, J., Fortin, P., Al-Taha, F., Alirezaee, P., Demers, M., Weill-Duflos, A., and Cooperstock, J. R. "Getting Your Hands Dirty Outside the Lab: A Practical Primer for Conducting Wearable Vibrotactile Haptics Research". IEEE Transactions on Haptics, Special Issue on Wearable and Hand-held Haptics, 12(3): 232-246. July 2019.

Sulmont, E., Patitsas, E., and Cooperstock, J. R. "What Is Hard About Teaching Machine Learning to Non-Majors? Insights From Classifying Instructors' Learning Goals". Transactions on Computing Education, Special Issue on Machine Learning Education, 19(4). August 2019.

Alirezaee, P., Schlesinger, J., and Cooperstock, J. R. "Ergonomic Haptic Displays - Reducing Clinician Dependence on Patient Monitors and Auditory Alarms". In Human Factors and Ergonomics in Healthcare Symposium, Chicago, IL, USA, March 2019.

Blum, J., and Cooperstock, J. R. "Single-Actuator Vibrotactile Numeric Information Delivery in the Face of Distraction". In World Haptics Conference, Tokyo, Japan, June 2019.

Fortin, P., Sulmont, E., and Cooperstock, J. R. "Detecting Perception of Smartphone Notifications using Skin Conductance Responses". In Human Factors in Computing (CHI), Glasgow, Scotland, April 2019. ACM (Honourable Mention)

Fortin, P., Blum, J., and Cooperstock, J. R. "Towards Consistent Haptic Coupling with HaptiStrap: Doing Better than "Tight yet Comfortable"". In User Interface Software and Technology (UIST), New Orleans, USA, October 2019. ACM

Fortin, P., Huang, D., and Cooperstock, J. R. "Exploring the Use of Fingerprint Sensor Gestures for Unlock Journaling: A Comparison with Slide-to-X". In Mobile HCI, Taipei, Taiwan, October 2019. ACM

Katzman, N., Gellert, M., Schlesinger, J. J., Oron-Gilad, T., Cooperstock, J. R., and Bitan, Y. "Evaluation of tactile cues for simulated patients' status under high and low workload". In International Meeting, October 2019. Human Factors and Ergonomics Society (HFES)

Kim, T., Blum, J., Alirezaee, P., Arnold, A., Fortin, P., and Cooperstock, J. R. "Usability of Foot-Based Interaction Techniques for Mobile Solutions". In Mobile Solutions and Their Usefulness in Everyday Life. Springer International Publishing AG, 2019.

Sulmont, E., Patitsas, E., and Cooperstock, J. R. "Can You Teach Me to Machine Learn?" In Special Interest Group on Computer Science Education Technical Symposium, Minneapolis, MN, February 2019.

de Vargas, M. F., Weill-Duflos, A., and Cooperstock, J. R. "Haptic Speech Communication Using Stimuli Evocative of Phoneme Production". In World Haptics Conference, Tokyo, Japan, June 2019.

Weill-Duflos, A., Al-Taha, F., Fortin, P., and Cooperstock, J. R. "BarryWhaptics: Towards Countering Social Biases Using Real-Time Haptic Enhancement of Voice". In World Haptics Conference, Tokyo, Japan, June 2019.

Yin, G., Otis, M., Fortin, P., and Cooperstock, J. R. "Evaluating Multimodal Feedback for Accomplishing Assembly Tasks in a Virtual Environment". In Engineering Interactive Computing Systems, Valencia, Spain, June 2019. ACM SIGCHI

Ferrie, Frank

Gallos, D., and Ferrie, F.P., "Active Vision in the Era of Convolutional Neural Networks", Proc. 13th Conference on Computer and Robot Vision (CRV), Kingston, Ontario, May 29-31, 2019, pp. 81-88.

Mu, Y, Dimitralopoulos, R., and Ferrie, F.P., "Generalizing Generative Models: Application to Super-Resolution", Proc. 13th Conference on Computer and Robot Vision (CRV), Kingston, Ontario, May 29-31, 2019, pp. 1-8.

Kovecses, Jozsef

Peiret A, Kövecses J., Font-Llagunes JM: “Analysis of Friction Coupling and the Painleve Paradox in Multibody Systems”, Multibody System Dynamics, Vol. 45, No. 3, pp. 361-378, 2019.

Enzenhofer A, Peiret A, Teichmann M, Kövecses J.: “A Unit-Consistent Error Measure for Multi- body Systems with Unilateral Constraints”, ASME Journal of Computational and Nonlinear Dynamics, 14(5): 051003, 12 pages, 2019.

Lou Q, Gonzalez F, Kövecses, J.: “Kinematic Modelling and State Estimation of Exploration Rovers”, IEEE Robotics and Automation Letters, Vol. 4, No. 2, pp. 1311-1318, 2019.

Gonzalez F, Arbatani S, Mohtat A, Kövecses, J.: “Energy-Leak Monitoring and Correction to Enhance Stability in the Co-simulation of Mechanical Systems”, Mechanism and Machine Theory, Vol. 131, pp. 172-188, 2019.

Peiret, A, Andrews, S., Kövecses, J., Kry, P.G., and Teichmann, M.: “Schur Complement-based Substructuring of Stiff Multibody Systems with Contact”, ACM Transactions on Graphics, Vol. 38, No. 5, Article 150, 17 pages, 2019.

Budai, Cs., Kovacs, L., Kövecses, J.,and Stepan, G.: “Combined Effects of Sampling and Dry Friction on Position Control”, Nonlinear Dynamics, 98:3001-3007, 2019.

Kovacs, L., Ghotbi, B., Gonzalez, F., Niksirat, P., Skonieczny, K., and Kövecses, J.: “Effect of Gravity in Wheel/Terrain Interaction Models”, Journal of Field Robotics, pp. 1-14, 2019.

A. Peiret, J. Kövecses, F. González, M. Teichmann: "Interface models for multirate co-simulation of non -smooth multibody systems", ASME IDETC 15th International Conference on Multibody Systems, Nonlinear Dynamics, and Control, Anaheim, CA, August 18–21, 2019.

A. Peiret, F. González, J. Kövecses, M. Teichmann, “Interface models in co-simulation of non-smooth systems”, 9th ECCOMAS Thematic Conference on Multibody Dynamics, Duisburg, Germany, July 15–18, 2019.

Kövecses, J.: "On the Concept of Constraints and the Foundations of Analytical Mechanics", 9th ECCOMAS Thematic Conference on Multibody Dynamics, Duisburg, Germany, July15–18, 2019.

Lou Q, Gonzalez F, Kövecses, J.: "Dynamics Modelling of Rovers for State Estimation", 9th ECCOMAS Thematic Conference on Multibody Dynamics, Duisburg, Germany, July15–18, 2019.

Kövecses, J.: "On the Concept of Nonholonomic Mechanical Systems", 13th Hungarian Conference on Mechanics, Miskolc, Hungary, Aug. 27-29, 2019.

Budai, Cs., Kovacs, L., Kövecses, J.,and Stepan, G.: "Combined effect of sampling and dry friction on positioning", The First International Nonlinear Dynamics Conference, Rome, Italy, Feb. 17-20, 2019.

A. Peiret, F. González, J. Kövecses, M. Teichmann: "Real-time co-simulation of mechanical systems", 8th International Conference on Coupled Problems in Science and Engineering, Sitges, Spain, June 3–5, 2019.

E. Karpman, D. Holz, J. Kövecses, P. Niksirat and K. Skonieczny: "Particle-based Modelling for Wheel-Soil Interaction and Analysis of Effects of Gravity", The 6th International Conference on Particle-Based Methods, Barcelona, Spain, Oct. 28-30, 2019.

E. Karpman, D. Holz, J. Kövecses, P. Niksirat and K. Skonieczny: "A Position-Based Discrete Element Method for Wheel-Soil Modelling", The 2019 Engineering Mechanics Institute and GeoInstitute Specialty Conference, Pasedena, CA, June 18-21, 2019.

Kry, Paul

K Erleben, M Macklin, S Andrews, PG Kry, "The Matchstick Model for Anisotropic Friction Cones", Computer Graphics Forum, November, 2019, pages 1-12. https://doi.org/10.1111/cgf.13885

A Peiret, S Andrews, J Kövecses, PG Kry, M Teichmann, "Schur complement-based substructuring of stiff multibody systems with contact", ACM Transactions on Graphics (TOG), 2019, 38 (5), pages 1-17. https://doi.org/10.1145/3355621

C Gingras, PG Kry, "Procedural Modelling with Reaction Diffusion and Growth of Thin Shells", Proceedings of Graphics Interface 2019, pages 1-7. https://doi.org/10.20380/GI2019.11

K Dreßel, K Erleben, PG Kry, S Andrews, "Automated acquisition of anisotropic friction", Proceedings of 16th Conference on Computer and Robot Vision (CRV), 2019, pages 159-165 https://doi.org/10.1109/CRV.2019.00029

Y Wang, S Khiat, PG Kry, D Nowrouzezahrai, "Fast non-uniform radiance probe placement and tracing", Proceedings of ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games, 2019, pages 1-9. https://doi.org/10.1145/3306131.3317024

K Ren, PG Kry, "Single stroke aerial robot light painting", Proceedings of the 8th ACM/Eurographics Expressive Symposium on Computational Aesthetics and Sketch Based Interfaces and Modeling and Non-Photorealistic Animation and Rendering, 2019, pages 61-67. https://doi.org/10.2312/exp.20191077

H Chen, PG Kry, E Vouga, "Locking-free Simulation of Isometric Thin Plates", 2019, November, pages 1-6. arXiv preprint https://arxiv.org/abs/1911.05204

B Wang, P Kry, Y Deng, U Ascher, H Huang, B Chen, "Learning Elastic Constitutive Material and Damping Models", 2019, September, pages 1-14. arXiv preprint https://arxiv.org/abs/1909.01875

Moritz Niklaus Bächer, HEPP Benjamin, Fabrizio Pece, Paul Gregory Kry, Bernd Bickel, Bernhard Steffen Thomaszewski, Otmar Hilliges. "Designing customized deformable input devices using simulated piezoelectric sensor responses". US Patent 10,399,327

Langer, Michael

M. Scaccia, M.S. Langer. "Density discrimination with occlusions in 3D clutter". Journal of Vision October 2019, 19 (10) doi:https://doi.org/10.1167/19.12.10

Mahajan, Aditya

J. Subramanian and A. Mahajan, "Reinforcement learning in stationary mean-field games," International Conference on Autonomous Agents and Multiagent Systems (AAMAS), Montreal, Canada, 13–17 May, 2019. (Accepted for oral presentation. 24% acceptance rate)

J. Subramanian and A. Mahajan, "Approximate information state for partially observed systems," IEEE Conference on Decision and Control, Nice, France, 11–13 Dec, 2019. (invited talk)

N. Akbarzadeh and A. Mahajan, "Restless bandits with controlled restarts: Indexability and computation of Whittle index," IEEE Conference on Decision and Control, Nice, France, 11–13 Dec, 2019.

S. Gao and A. Mahajan, "Networked control of coupled subsystems: Spectral decomposition and low-dimensional solutions," IEEE Conference on Decision and Control, Nice, France, 11–13 Dec, 2019.

N. Akbarzadeh and A. Mahajan, "Dynamic spectrum access under partial observations: A restless bandit approach," Canadian Workshop on Information Theory (CWIT), Hamilton, Ontario, June 2–5, 2019. (invited talk)

J. Subramanian and A. Mahajan, "Approximate information state for partially observed systems," Conference on Reinforcement Learning and Decision Making (RLDM), Montreal, Canada, 7–10 July, 2019.

J. Subramanian, R. Seraj, and A. Mahajan, "Reinforcement learning for mean-field teams," Conference on Reinforcement Learning and Decision Making (RLDM), Montreal, Canada, 7–10 July, 2019.

J. Subramanian and A. Mahajan, "Approximate information state for partially observed systems," Neural Information Processing Systems (NeurIPS) Workshop on Optimization Foundations of Machine Learning, Vancouver, Canada, 14 Dec, 2019.

A. Mahajan and J. Subramanian, "Representation Learning via state aggregation: A perspective of control over communication channels," Neural Information Processing Systems (NeurIPS) Workshop on Information Theory and Machine Learning, Vancouver, Canada, 7 Dec, 2019.

J. Subramanian, R. Seraj, and A. Mahajan, "Reinforcement learning for mean-field teams," AAMAS Workshop on Adaptive and Learning Agents (ALA), Montreal, Canada, 13–17 May, 2019.

J. Subramanian, A. Kumar, and A. Mahajan, "Mean-field games between teams," 11th Workshop on Dynamic Games in Management Science, Montreal, Canada, 24–25 Oct, 2019.

J. Subramanian and A. Mahajan, "Approximate dynamic programming and reinforcement learning for partially observed systems," Montreal AI Symposium, Montreal, Canada, 6 Sep, 2019.

J. Subramanian and A. Mahajan, "Reinforcement learning in stationary mean-field games," Information Theory and Applications (ITA) Workshop, San Diego, CA, 11–15 Feb, 2019. (invited talk)

J. Subramanian and A. Mahajan, "Reinforcement learning in stationary mean-field games," Les Cahiers du GERAD, no. G-2019-18, March 2019.

Meger, David

Edward Smith, Scott Fujimoto, Adriana Romero, and David Meger. "Geometrics: Exploiting geometric structure for graph-encoded objects". In Proceedings of the International Conference on Machine Learning (ICML), 2019. Long oral.

Scott Fujimoto, David Meger, and Doina Precup. "Off-policy deep reinforcement learning without exploration". In Proceedings of the International Conference on Machine Learning (ICML), 2019. Short oral and poster.

Jimmy Li, David Meger, and Gregory Dudek. "Semantic mapping for view-invariant relocalization". In Proceedings of the IEEE International Conference on Robotics and Automation (ICRA), 2019.

Sanjay Thakur, Herke Van Hoof, Juan Camilo Gamboa Higuera, Doina Precup, and David Meger. "Uncertainty aware learning from demonstrations using bayesian neural networks". In Proceedings of the IEEE International Conference on Robotics and Automation (ICRA), 2019.

Sahand Rezaei-Shoshtari, David Meger, and Sharf Inna. "Cascaded gaussian processes for data efficient robot dynamics learning". In Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2019.

Yi Tian Xu, Yaqiao Li, and David Meger. "Human motion prediction via pattern completion in latent representation space". In Proceedings of the Conference on Computer and Robot Vision (CRV), 2019.

Melissa Mozifian, Juan Camilo Gamboa Higuera, David Meger, and Gregory Dudek. "Learning domain randomization distributions for transfer of locomotion policies". In Proceedings of the Workshop on Multi-Task and Lifelong Reinforcement Learning at ICML, 2019.

Caleb Hoyne, S. Karthik Mukkavilli, and David Meger. "Deep learning for Aerosol Forecasting". In Proceedings of the Machine Learning and the Physical Sciences Workshop at the 33rd Conference on Neural Information Processing Systems (NeurIPS), Vancouver, Canada, 2019.

Scott Fujimoto, David Meger and Doina Precup. "Off-Policy Deep Reinforcement Learning without Exploration". Poster presentation at the 4th Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM). Montreal, Canada, 2019.

Scott Fujimoto, David Meger and Doina Precup. "Off-Policy Deep Reinforcement Learning without Exploration". Poster presentation at the Montreal Artificial Intelligence Symposium (MAIS). Montreal, Canada, 2019.

Edward Smith, Scott Fujimoto, Adriana Romero, and David Meger. "Geometrics: Exploiting geometric structure for graph-encoded objects". Poster presentation at the Montreal Artificial Intelligence Symposium (MAIS). Montreal, Canada, 2019.

] Xiru Zhu, Fengdi Che, Tianzi Yang, Tzuyang Yu, David Meger, Gregory Dudek. "Detecting GAN generated errors". arXiv preprint arXiv:1912.00527, 2019. PAGE 2

Sanjay Thakur, Herke Van Hoof, Gunshi Gupta, David Meger. "Unifying Variational Inference and PAC-Bayes for Supervised Learning that Scales". arXiv preprint arXiv:1910.10367, 2019.

Nahon, Meyer

E. Bulka and M. Nahon, 2019, "Automatic Control for Aerobatic Maneuvering of Agile Fixed-Wing UAVs", Journal of Intelligent and Robotic Systems, Vol. 93, Issue 1–2, pp. 85–100. [Journal Impact Factor: 2.02]

M. Al-Solihat and M. Nahon, 2019, "Dynamic Modeling and Simulation of a Spar Floating Offshore Wind Turbine with Consideration of Rotor Speed Variations", ASME Journal of Dynamic Systems, Measurement and Control, Vol. 141, No. 8, 12 pages. [Journal Impact Factor: 1.47]

J. Levin, A. Paranjape and M. Nahon, 2019, "Agile Maneuvering with a Small Fixed-Wing Unmanned Aerial Vehicle", Robotics and Autonomous Systems, Vol. 116, pp. 148-161. [Journal Impact Factor: 2.93]

A Battiston, I. Sharf and M. Nahon, 2019, "Attitude Estimation for Collision Recovery of a Quadcopter Unmanned Aerial Vehicle". International Journal of Robotics Research, Vol. 38, No. 10-11, pp. 1286-1306. [Journal Impact Factor: 6.13]

J. Levin, A. Paranjape and M. Nahon, 2019, "Real-Time Motion Planning with a Fixed-Wing Unmanned Aerial Vehicle using an Agile Maneuver Space", Autonomous Robots, Vol. 43, No. 8, pp. 2111–2130. [Journal Impact Factor: 3.63]

R. Chiappinelli, M. Cohen, M. Doff-Sottay, M. Nahon, J. R. Forbes and J. Apkarian, 2019, "Modeling and Control of a Passively-Coupled Tilt-Rotor Vertical Takeoff and Landing Aircraft", International Conference on Robotics and Automation (ICRA2019), Montreal, Canada, May 20-24.

M. F. Javed Butt, M. P. Paidoussis and M. Nahon, 2019, "Dynamics of a Confined Pipe Aspirating Fluid: an Experimental Investigation", 27th Canadian Congress on Applied Mechanics (CANCAM 2019), Sherbrooke, QC, May 27-30.

S. Fielding and M. Nahon, 2019, "Input Shaped Trajectory Generation and Controller Design for a Quadrotor -Slung Load System", International Conference on Unmanned Aircraft Systems (ICUAS'19), Atlanta, GA, June 11-14.

E. Bulka and M. Nahon, 2019, "High-Speed Obstacle-Avoidance with Agile Fixed-Wing Aircraft", International Conference on Unmanned Aircraft Systems (ICUAS'19), Atlanta, GA, June 11-14.

W. Jothiraj, C. Miles, E. Bulka, I. Sharf and M. Nahon, 2019, "Enabling Bidirectional Thrust for Aggressive and Inverted Quadrotor Flight", International Conference on Unmanned Aircraft Systems (ICUAS'19), Atlanta, GA, June 11-14.

M. P. Paidoussis, A. R. Abdelbaki, M. F. Javed Butt, K. Moditis, A. K. Misra and M. Nahon, 2019, "Dynamics of a Pipe Subjected to Internal and Confined External Flow", Proceedings of the ASME 2019 Pressure Vessels & Piping Conference (PVP2019), San Antonio, TX, July 14-19.

M. F. Javed Butt, M. P. Paidoussis and M. Nahon, 2019, "Dynamics of a Confined Pipe Aspirating Fluid: a Theoretical Investigation", IMECE International Mechanical Engineering Congress & Exposition, Salt Lake City, UT, November 11 – 14.

Nowrouzezahrai, Derek

Iliyan Georgiev, Zackary Misso, Toshiya Hachisuka, Derek Nowrouzezahrai, Jaroslav Krivanek, Wojciech Jarosz. "Integral formulations of volumetric transmittance". ACM Transactions on Graphics - Proceedings of the SIGGRAPH Asia Annual Conference. (Nov. 2019). 17 pages.

Dario Seyb, Alec Jacobson, Derek Nowrouzezahrai, Wojciech Jarosz. "Non-linear sphere tracing for rendering deforming". ACM Transactions on Graphics - Proceedings of the SIGGRAPH Asia Annual Conference. (Nov. 2019). 12 pages.

Ethan Tseng, Felix Yu, Yuting Yang, Fahim Manan, Karl St. Arnaud, Derek Nowrouzezahrai, Jean-Francois Lalonde, Felix Heide. "Hyperparameter Optimization in Black-box Imaging". ACM Transactions on Graphics - Proceedings of the SIGGRAPH Annual Conference. (Aug. 2019). 14 pages.

Sebastian Herholz, Yangyang Zhao, Oskar Elek, Derek Nowrouzezahrai, Hendrik Lensch and Jaroslav Krivanek. "Volume Path Guiding using Zero-variance Random Walk Theory". ACM Transaction on Graphics - Presented at SIGGRAPH Annual Conference. 19 pages.

Joey Litalien, Damien Rioux-Lavoie, Adrien Gruson, Toshiya Hachisuka, Derek Nowrouzezahrai. "Delayed Rejection Metropolis Light Transport". ACM Transactions on Graphics (December 2019). 14 pages.

Luis Eduardo Gamboa, Adrien Gruson and Derek Nowrouzezahrai. "A Lightweight, Efficient Transport Estimator in Layered Materials". Computer Graphics Journal - Proceedings of the Eurographics Annual Conference (December 2019). 10 pages.

Olivier Mercier and Derek Nowrouzezahrai."Local Bases for Model-reduced Smoke Simulations". Computer Graphics Journal - Proceedings of the Eurographics Annual Conference (December 2019). 12 pages.

Binh-Son Hua, Adrien Gruson, Victor Petitjean, Matthias Zwicker, Derek Nowrouzezahrai, Elmar Eisemann and Toshiya Hachisuka. "A Survey on Gradient-domain Rendering". Eurographics State-of-the-art Reports. Presented at the Eurographics Annual Conference (April 2019). 16 pages.

Chakravarty Alla Reddy Chaitanya, John Snyder, Keith Godin, Derek Nowrouzezahrai and Nikunj Raghuvanshi. "Adaptive Sampling for Sound Propagation". IEEE Transactions on Visualization and Computer Graphics Journal - Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR; March 2019). 10 pages.

Daniel Holden, Bang Chi Duong, Sayantan Datta, Derek Nowrouzezahrai. "Subspace Neural Physics: Fast Data-Driven Interactive Simulation". Proceedings of the ACM/SIGGRAPH Symposium on Computer Animation. (April 2019). 10 pages.

Nicolas Vibert, Adrien Gruson, Heine Stokholm, Troels Mortensen, Wojciech Jarosz, Toshiya Hachisuka, Derek Nowrouzezahrai. "Scalable Virtual Ray Lights Rendering for Participating Media". Computer Graphics Journal - Proceedings of the Eurographics Symposium on Rendering. (June 2019). 10 pages.

Hsueh-Ti Derek Liu, Michael Tao, Chun-Liang Li, Derek Nowrouzezahrai, Alec Jacobson. "Beyond Pixel Norm-Balls: Parametric Adversaries using an Analytically Differentiable Renderer". Proceedings of the International Conference on Learning Representations. (Jul. 2019). 18 pages.

Adrien Doubouchet, Peter-Pike Sloan, Wojciech Jarosz, Derek Nowrouzezahrai. "Impulse responses for precomputing light from volumetric media". Proceedings of the Eurographics Symposium on Rendering. (June 2019). 11 pages.

Yue Wang, Soufiane Khiat, Paul Kry, Derek Nowrouzezahrai. "Fast Non-uniform Radiance Probe Placement" Proceedings of the ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games. (June 2019). 10 pages. Best Student Paper Award Winner.

Zander Majercik, Jean-Philippe Guertin, Derek Nowrouzezahrai, Morgan McGuire "Dynamic Diffuse Global Illumination with Ray-traced Irradiance Fields". Journal of Computer Graphics Techniques - Presented at the ACM/SIGGRAPH Symposium on Interactive 3D Graphics and Games. (March 2019). 12 pages. Best Presentation Award Winner.

Julien Roy, Paul Barde, Felix G. Harvey, Derek Nowrouzezahrai, Christopher Pal. "Promoting Coordination through Policy Regularization in Multi-agent Reinforcement Learning". Proceedings of the Multi-disciplinary Conference on Reinforcement Learning and Decision Making. (July 2019). 16 pages.

David Milaenen, Laurent Belcour, Jean-Philippe Guertin, Toshiya Hachisuka, Derek Nowrouzezahrai. "A Frequency Analysis and Dual Hierarchy for Efficient Rendering of Subsurface Scattering". Proceedings of the Graphics Interface Conference. (Nov. 2019). Best Paper Award Winner.

Julien Roy, Paul Barde, Felix G. Harvey, Derek Nowrouzezahrai, Christopher Pal. "Coordinating Multi-agent Reinforcement Learning". The Montreal Symposium on Artificial Intelligence. (Oct. 2019). 12 pages.

Yangyang Zhao, Laurent Belcour, Derek Nowrouzezahrai. "View-dependent Radiance Caching". Proceedings of the Graphics Interface Conference. (Nov. 2019). 11 pages.

Ethan Tseng, Felix Yu, Yuting Yang, Fahim Manan, Karl St. Arnaud, Derek Nowrouzezahrai, Jean-Francois Lalonde, Felix Heide. "Optimizating Black-box Imaging Hyperparameter Search". The Montreal Symposium on Artificial Intelligence. (Oct. 2019). 10 pages.

Martin Weiss, Simon Chamorro, Roger Girgis, Margaux Luck, Samira E. Kahou, Joseph P. Cohen, Derek Nowrouzezahrai, Doina Precup, Florian Golemo, Christopher Pal. "Navigation Agents for the Visually Impaired: A Sidewalk Simulator and Experiments". Proceedings of the Third Conference on Robot Learning. (Nov. 2019). 14 pages.

Sai Rajeswar, Jerome Parent-Levesque, Fahim Mannan, Florian Golemo, David Vazquez, Derek Nowrouzezahrai, Aaron Courville. "Unsupervised Learning of 3D Scenes from Images using a View-based Representation". International Journal on Computer Vision - Proceedings of the Special Issue on Generative Adversarial Networks. (Dec. 2019). 16 pages.

Wonseok Jeon, Paul Barde, Joelle Pineau and Derek Nowrouzezahrai. "Scalable and Sample-Efficient Multi-Agent Imitation Learning". Proceedings of the AAAI 2020 Workshop on Reinforcement Learning in Games. (Dec. 2019). 8 pages.

Maxime Chevalier-Boisvert, Guillaume Alain, Florian Golemo and Derek Nowrouzezahrai. "Robo-PlaNet: Learning to Poke in a Day". Arxiv Preprint. (Nov. 2019). 4 pages.

Sai Rajeswar, Fahim Mannan, Florian Golemo, David Vazquez, Derek Nowrouzezahrai, Aaron Courville. "Pix2Scene: Learning Implicit 3D Representations from Images". Arxiv Preprint. (Nov. 2019). 16 pages.

Deep Learning Applications for Realistic, Simulation-based Computer Graphics. Invited Researcher Tea Talk at Ubisoft Montreal. May 2019.

Pineau, Joelle

I.V. Serban, C. Sankar, M. Pieped, J. Pineau, Y. Bengio. "The Bottleneck Simulator: A Model-based Deep Reinforcement Learning Approach". Journal of Machine Learning Research (JMLR). Accepted.

V. François-Lavet, G. Rabusseau, J. Pineau, D. Ernst, R. Fontaineau. "On Overfitting and Asymptotic Bias in Batch Reinforcement Learning with Partial Observability". Journal of AI Research (JAIR). Vol.65. pp.1-30. 2019.

A.M.Froomkin, I. Kerr, J. Pineau. "When AIs outperform doctors: Confronting the challenges of a tort-induced over-reliance on machine learning". Arizona Law Review, vol.61:33. 2019.

P. Paquette, Y. Lu, S. Bocco, M.O. Smith, S. Ortiz-Gagne, J. K. Kummerfeld, S. Singh, J. Pineau, A. Courville. "No Press Diplomacy: Modeling Multi-Agent Gameplay". NeurIPS 2019.

M. Assran, J. Romoff, N. Ballas, J. Pineau, M. Rabbat. "Gossip-based Actor-Learner Architectures for Deep Reinforcement Learning". NeurIPS 2019.

J. Romoff, P. Henderson, A. Touati, E. Brunskill, J. Pineau, Y. Ollivier, "Separable value functions across time-scales". ICML 2019.

A. Das, T. Gervet, J. Romoff, D. Batra, D. Parikh, M. Rabbat, J. Pineau, "TarMAC: Targeted Multi-Agent Communication". ICML 2019.

K. Sinha, S. Sodhani, J. Dong, J. Pineau, W. L. Hamilton. "CLUTRR: A Diagnostic Benchmark for Inductive Reasoning from Text". EMNLP 2019.

B. Mazoure, T. Doan, A. Durand, R.D. Helm, J. Pineau. "Leveraging exploration in off-policy algorithms via normalizing flows". CoRL 2019

L. Caccia, H. van Hoof, A. Courville, J. Pineau. "Deep Generative Modeling of LiDAR Data". IROS 2019.

R. Lowe, J. Foerster, Y-L. Boureau, J. Pineau, Y. Dauphin. "On the Pitfalls of Measuring Emergent Communication". AAMAS 2019.

J. Pineau, K. Sinha, G. Fried, R.N. Ke, H. Larochelle (guest editors). ReScience Journal, vol.5(2). Special Issue on the ICLR Reproducibility Challenge 2019.

Sharf, Inna

Battiston, A., Sharf, I., Nahon, M. (2019). "Attitude estimation for collision recovery of a quadcopter unmanned aerial vehicle", International Journal of Robotics Research, 38(10-11), pp. 1286-1306.

C. Miles, E. Botta, and I. Sharf, (2019). "Simulation and Tension Control of a Tether-Actuated Closing Mechanism for Net-Based Capture of Space Debris," 70th International Astronautical Congress, Washington DC, Oct. 21-25.

Jothiraj, W., Miles, C., Bulka, E., Sharf, I., Nahon, M. (2019). "Enabling bidirectional thrust for aggressive and inverted quadrotor flight", 2019 International Conference on Unmanned Aircraft Systems, ICUAS 2019, Atlanta, June 11-14, 8798234, pp. 534-541.

Jorgensen, M. and Sharf, I. (2019). "Optimal Drift Orbit Planning for a Multiple Space Debris Removal Mission using High-Accuracy Low-Thrust Transfers". In 2019 First International Orbital Debris Conference, Sugar Land, Texas, December 9–12.

Siddiqi, Kaleem

K Kumar, K Siddiqi, C Desrosiers, "White matter fiber analysis using kernel dictionary learning and sparsity priors". Pattern Recognition 95, 83-95, 2019.

J Wilder, M Rezanejad, S Dickinson, K Siddiqi, A Jepson, DB Walther. "Local contour symmetry facilitates scene categorization". Cognition 182, 307-317, 2019.

Y Wang, Y Xu, S Tsogkas, X Bai, S Dickinson, K Siddiqi. "Deepflux for skeletons in the wild". Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2019.

M Rezanejad, G Downs, J Wilder, DB Walther, A Jepson, S Dickinson, K Siddiqi. "Scene categorization from contours: Medial axis based salience measures". Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition, 2019.

B Samari, TA Syed, K Siddiqi. "Minimizing Non-holonomicity: Finding Sheets in Fibrous Structures". International Conference on Information Processing in Medical Imaging, 183-194, 2019.

M. Rezanejad , G. Downs , J. Wilder, D. B. Walthers, A. Jepson, S. Dickinson and K. Siddiqi. "Perceptually Weighted Contours for CNN-Based Scene Categorization". In Conference on Cognitive Computational Neuroscience, Berlin, Germany, 2019.

J. Wilder, M. Rezanejad , K. Siddiqi, A. Jepson, S. Dickinson and D. B. Walthers. "Local Contour Symmetry Facilitates the Neural Representation of Scene Categories in the PPA". In Conference on Cognitive Computational Neuroscience, Berlin, Germany, 2019.

M Rezanejad, G Downs, J Wilder, DB Walther, A Jepson, S Dickinson, K Siddiqi. "Perceptual grouping aids recognition of line drawings of scenes by CNNs". Journal of Vision 19 (10), 129-129, (oral presentation at VSS 2019).

JD Wilder, M Rezanejad, K Siddiqi, A Jepson, S Dickinson, DB Walther. "The neural basis of local contour symmetry in scene perception". Journal of Vision 19 (10), 189a-189a (poster presentation at VSS 2019).

C Wang, M Pelillo, K Siddiqi. "Dominant set clustering and pooling for multi-view 3d object recognition". arXiv preprint arXiv:1906.01592

C Wang, B Samari, V Kim, S Chaudhuri, K Siddiqi. "FAN: Focused Attention Networks". arXiv preprint arXiv:1905.11498

Invited Lectures – 2019

Arbel, Tal

Invited speaker and Panelist, Goodman Cancer Research Centre Public Forum: "AI & machine learning: the future of cancer detection and treatment is now", Montreal, Quebec, Canada, October 2019.

Invited speaker, "Machine Learning for Lesion and Tumour Detection, Segmentation and Disease Prediction in Patient Brain Images", McGill Winter Professor Series, Montreal, Quebec, Canada, March 27, 2019.

Invited plenary speaker, "Machine Learning for Medical Image Analysis: Towards MRI-Based Precision Medicine", Conference of the International Society of Magnetic Resonance Imaging for Medicine (ISMRM 2019), Montreal, Quebec, Canada, May 14, 2019. (6000 attendees)

Invited speaker, "Uncertainties in Machine Learning for Medical Image Analysis of Patient MRI", Conference of the International Society of Magnetic Resonance Imaging for Medicine (ISMRM 2019), Educational Session, Montreal, Quebec, Canada, May 11, 2019. (1000 attendees)

Invited keynote speaker, "Precision Medicine for MS based on MRI", Conference on Americas Committee for Treatment and Research in Multiple Sclerosis (ACTRIMS 2019), Dallas, Texas, U.S.A., March 2, 2019.

Invited speaker, "Machine Learning for Medical Image Analysis: Towards MRI-Based Precision Medicine", Meeting of the International Progressive MS Alliance (IPMSA), Copenhagen, Denmark, May 24, 2019.

Invited speaker, "Modelling Uncertainties in Machine Learning for Lesion and Tumour Detection, Segmentation and Disease Prediction in Medical Images", John's Hopkins, Baltimore, MD, U.S.A., Dec. 3, 2019.

Invited speaker, "Machine Learning for Medical Image Analysis: Towards MRI-Based Precision Medicine", Seminar Series: McGill Medical Physics Unit, Montreal, Quebec, Canada, May 31, 2019.

Invited speaker, "Machine Learning in Medical Image Analysis: Towards MRI-Based Precision Medicine", Facebook AI Research Labs, Montreal, Quebec, November 2019.

Boulet, Benoit

Boulet, B., Gestion d'un grand programme de R&D collaborative industrielle-académique en électrification. Presentation at Nergica Rendez-Vous Electrification 2019, Montreal, Canada, October 29, 2019.

Boulet, B., Animation de l'atelier de la mise en oeuvre des projets en électrification des transports, et de la séance plénière. Nergica Rendez-Vous Electrification 2019, Montreal, Canada, October 29, 2019.

Caines, Peter

City University, Hong Kong, 24th June, 2019. "Graphon Mean Field Games"

Hong Kong Polytechnic University, 28th June, 2019. "Graphon Control and Graphon Mean Field Games"

Banff International Research Station and Casa Matematica, Oaxaca, Mexico 20th - 24th May, 2019 Conference entitled "Scaling Limits of Dynamical Processes on Random Graphs". PEC presentation "Graphon Mean Field Games"

NetSci2019 Satellite Symposium, University of Vermont, 28th May, 2019. "Controlling Complex Networks" PEC presentation "Graphon Mean Field Games and the Control of Complex Networks"

CIRM, Luminy, Marseille, "Crowds: Models and Control", 3rd - 7th June, PEC "Graphon Mean Field Games: Theory and Applications"

Saint Petersburgh University, Russia, 6th September, 2019. " Graphon Mean Field Games: an Equilibrium Theory for a Networked World."

Mean Field Games and Related Topics, Levico Terme, Trento, Italy, 9th - 13th September (participation 11th - 13th) PEC "Graphon Mean Field Games"

Georges Zaccour Festschrift Meeting and HEC Conference, 24th-25th October. PEC presentation "Graphon Mean Field Games"

Invited presentation at the IEEE Conference on Decision and Control, Nice, December, 2019: P. E. Caines and M.Y. Huang, "Graphon Mean Field Games and the GMFG Equations: $epsilon$-Nash Equilibria" . Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, December, 2019.

Invited presentation at the IEEE Conference on Decision and Control, Nice, December, 2019:R. Foguen**, R.P. Malheme' and P. E. Caines ,A Quantilized Mean Field Game Approach To Energy Pricing With Application To Fleets Of Plug-In Electric Vehicles. '' Proceedings of the 58th IEEE Conference on Decision and Control, Nice, France, December, 2019, pp. 299-304

Clark, James

Presentation and panelist at the McGill CIRMMT Workshop: The past, present, and promise of sound synthesis: Analog, digital, and beyond. May 1 2019

Huawei Noah's Ark Lab, Montreal Research Centre

Robotics Laboratory, Department of Mechanical and Aerospace Engineering, Seoul National University

Cooperstock, Jeremy

“Assistive Technology Research in the Shared Reality Lab”, Institut Nazareth et Louis-Braille, Longeuil, September 25, 2019.

“I Feel the Earth Move (Under My Feet): Haptic Interaction for Telepresence and Information Delivery”, Department of Information Engineering and Computer Science, University of Trento, July 4, 2019.

Kövecses, Jozsef

"Task-Oriented Modelling of Mechanical Systems", invited research seminar at the University of Miskolc, Hungary, April 15, 2019.

"Task and Information Driven Modelling of Mechanical Systems", invited research seminar at the Technical University of Catalonia, Barcelona, Spain, June 7, 2019.

"Co-simulation of Nonsmooth Mechanical Systems", invited presentation at the Eighth Symposium of the European Network for Nonsmooth Dynamics, Grenoble, France, Sep. 17-18, 2019.

"Task-Oriented Modelling of Mechanical Systems", invited research seminar Rensselaer Polytechnic Institute, Troy, NY, Oct. 9, 2019.

Kry, Paul

CRV invited speaker, 30 May 2019 Artistic Aerial Robots

Texas A&M (TAMU) invited computer science department seminar, 29 April 2019 Efficient physics-based simulation and artistic aerial robots

UT Austin invited graphics group talk, 2 May 2019 Efficient physics-based simulation and artistic aerial robots

Contact PhD Summer School, Copenhagen, 13 August 2019 Challenges of Elastic Solids and Frictional Contact (4 parts, from 9am to 3pm)

ACM SIGGRAPH Eurographics Expressive Graphics, 5 May 2019 Single Stroke Aerial Robot Light Painting

ICRA-X Robotic Art Program, 22 May 2019 Single Stroke Aerial Robot Light Painting

ACM SIGGRAPH Asia – Tech Papers Fast Forward, 17 November 2019 Schur Complement-based Substructuring of Stiff Multibody Systems with Contact

Mahajan, Aditya

"Reinforcement Learning in stationary mean-field games", Information Theory and Applications (ITA), San Diego, CA, Feb 2019.

"Dynamic spectrum access under partial observations: A restless bandit approach", Canadian Workshop on Information Theory, June 2019.

"Approximate information state for partially observed systems", IEEE Conference on Decision and Control, Nice, France, Dec 2019.

"Information state (and its approximations) for stochastic control", BIRS-CMO Workshop on multi-stage stochastic optimization for clean energy transition, Sep 2019.

Meger, David

Invited panelist and the Reinforcment Learning session, Huawei Research Canada workshop at Neural Information Processing Systems (NeurIPS), Vancouver, BC. December, 2019.

Huawei Research Canada Markham, ON. August, 2019.

Symposium speaker at the Computer and Robot Vision conference, Kingston, ON. May, 2019.

Mobilit.AI Forum, invited speaker, Montreal, QC. May 2019.

McGill McDonald Campus Founders Day, keynote speaker and panelist, St-Anne-de-Bellevue, QC. February, 2019.

Presented poster "Off-Policy Deep Reinforcement Learning without Exploration" at the 4th Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM). Montreal, Canada, 2019.

Nowrouzezahrai, Derek

Deep Learning Applications for Realistic, Simulation-based Computer Graphics. Invited Researcher Tea Talk. Ubisoft Montreal. Host: Dr. Yves Jaquier. February 2019.

Pineau, Joelle

[Plenary/Keynote] Building Reproducible, Reusable, and Robust Machine Learning Software. ACM/IEEE Int Conf on Software Engineering (ICSE). May 31 2019. ICSE is the premier international conference on Software Engineering, with 2000 attendees.

[Plenary/Keynote] Improving health-care: challenges and opportunities for machine learning. 19th Int Conf on the use of Computers in Radiation Therapy (ICCR) and 2nd Int Conf on Monte Carlo Techniques for Medical Applications (MCMA). June 19 2019.

[Plenary/Keynote] "Digital solutions transforming patient care". International Medical Education Leaders Forum (IMELF). Ottawa, Canada. September 2019.

[Invited] Reproducible, Reusable, and Robust Reinforcement Learning. Institute for Advanced Study, Princeton. Feb 22 2019.

[Invited] Hope and Hype of AI. Machine MD. University of Ottawa. May 31 2019.

[Invited] "Building Reproducible, Reusable, and Robust Machine Learning Software". MIT Media Lab. Boston, MA. July 2019.

[Invited] "Machine Learning Reproducibility: An update from the NeurIPS 2019 Reproducibility Co-Chairs" NeurIPS 2019 workshop on Systems for ML. Vancouver, Canada. December 2019.

Sharf, Inna

"Lighter-than-air Aerial Robots", invited presentation at ICRA 2019 Workshop 'The Future of Aerial Robotics: Challenges and Opportunities,' May 23, 2019, Montreal, Canada

Siddiqi, Kaleem

"Deepflux for skeletons in the wild". Poster presentation at CVPR 2019, Longbeach, CA.

"Scene categorization from contours : Medial axis based salience measures". Poster presentation at CVPR 2019, Longbeach CA.

"Minimizing Non-holonomicity : Finding sheets in fibrous structures". Oral presentation at IPMI 2019, Hong Kong. Talk by Tabish Syed.

"Perceptual grouping aids recognition of line drawings of scenes by CNNs". Oral presentation at VSS 2019, St. Pete Beach, Florida. Talk by Morteza Rezanejad.

"The neural basis of local contour symmetry in scene perception". Poster presentation at VSS 2019, Florida.

Appendix I – Associate Publications

Armanfard, Narges

N. Armanfard, M. Komeili, J. P. Reilly, J. F. Connolly, (2019), "A Machine Learning Framework for Automatic and Continuous MMN Detection with Preliminary Results for Coma Outcome Prediction", IEEE Journal of Biomedical and Health Informatics, vol. 23, no. 4, pp. 1794 – 1804.

IS. Chang, N. Armanfard, AQ. Javaid, J. Boger, A. Mihailidis, (2019), "Unobtrusive Detection of Changes in Systolic Blood Pressure using RJ-Interval of Healthy Adults with Potential Application in Orthostatic Hypotension and Supine Hypertension", Engineering in Medicine and Biology Society (EMBC), 41th Annual International Conference of the IEEE, Berlin, Germany.

Cheung, Jackie Chi Kit

Dlan Porada, Kaheer Suleman, Jackie Chi Kit Cheung. 2019. "Can a Gorilla Ride a Camel? Learning Semantic Plausibility from Text". In EMNLP-IJCNLP 2019 Workshop on Commonsense Inference in Natural Language Processing, pages 123-129.

Meng Cao and Jackie C.K. Cheung. 2019. "Referring Expression Generation Using Entity Profiles". In Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP 2019). Hong Kong, China, pages 3163-3172.

Matt Grenander, Yue Dong, Jackie C.K. Cheung and Annie Louis. 2019. "Countering the Effects of Lead Bias in News Summarization via Multi-stage Training and Auxiliary Losses". In Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP 2019). Hong Kong, China, pages 6019-6024.

Paul Trichelair, Ali Emami, Adam Trischler, Kaheer Suleman and Jackie C.K. Cheung. 2019. "How Reasonable are Common-Sense Reasoning Tasks: A Case-Study on the Winograd Schema Challenge and SWAG". In Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP 2019). Hong Kong, China, pages 3382-3387.

Yue Dong, Zichao Li, Mehdi Rezagholizadeh and Jackie Chi Kit Cheung. 2019. "EditNTS: An Neural Programmer-Interpreter Model for Sentence Simplification through Explicit Editing". In Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL 2019). Florence, Italy, pages 3393-3402.

Ali Emami, Paul Trichelair, Adam Trischler, Kaheer Suleman, Hannes Schulz and Jackie Chi Kit Cheung. 2019. "The KnowRef Coreference Corpus: Removing Gender and Number Cues for Difficult Pronominal Anaphora Resolution". In Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL 2019). Florence, Italy, pages 3952-3961.

Peng Xu, Hamidreza Saghir, Jin Sung Kang, Teng Long, Avishek Joey Bose, Yanshuai Cao and Jackie Chi Kit Cheung. 2019. "A Cross-Domain Transferable Neural Coherence Model". In Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL 2019). Florence, Italy, pages 678-687.

Krtin Kumar and Jackie C.K. Cheung. 2019. "Understanding the Behaviour of Neural Abstractive Summarizers Using Contrastive Examples". In Proceedings of the 2019 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, pages 3949–3954. Minneapolis, Minnesota.

Weiwei Zhang, Jackie C.K. Cheung and Joel Oren. 2019. "Generating Character Descriptions for Automatic Summarization of Fiction". In AAAI 2019, pages 7476-7483.

Pengfei Liu, Jie Fu, Yue Dong, Xipeng Qiu and Jackie C.K. Cheung. 2019. "Learning Multi-task Communication with Message Passing for Sequence Learning". In AAAI 2019, pages 4360-4367.

Pengfei Liu, Shuaichen Chang, Jian Tang and Jackie C.K. Cheung. 2019. "Contextualized Non-local Neural Networks for Sequence Learning". In AAAI 2019, pages 6762-6769.

Kian Kenyon-Dean, Andre Cianflone, Lucas Page-Caccia, Guillaume Rabusseau, Jackie Chi Kit Cheung, Doina Precup. 2019. "Clustering-Oriented Representation Learning with Attractive-Repulsive Loss". In Proceedings of the AAAI-19 Workshop on Network Interpretability for Deep Learning, 9 pages.

Forbes, James Richard

'LX. Shan, J. Angeles, and J.R. Forbes, "A novel capacitive sensing structure for simultaneous detection of biaxial low-g acceleration in a commercial MEMS process," Microsystem Technologies, vol. 25, no. 12, pp. 4475–4481, 2019

L. J. Bridgeman and J. R. Forbes, "Iterative H2-Conic Controller Synthesis," International Journal of Robust and Nonlinear Control, vol. 29, no. 11, pp. 3701 –3714, 2019.

J. R. Forbes, "Synthesis of Strictly Positive Real H2 Controllers Using Dilated LMIs," International Journal of Control, vol. 92, no. 11, pp. 2584–2590, 2019.

H. A. Godbole, R. J. Caverly, and J. R. Forbes, "Dynamic Modelling and Adaptive Control of a Flexible Cable-Driven Parallel Robot," ASME Journal of Dynamic Systems, Measurement and Control, vol. 141, no. 10, p. 101002 (13 pages), 2019.

R. Aucoin, S. A. Chee, and J. R. Forbes, "Nonlinear Approaches to Linear- and Linear-Matrix- Inequality-Constrained State Estimation," IEEE Transactions on Aerospace and Electronic Systems, vol. 55, no. 6, pp. 3153 – 3167, 2019.

D. E. Zlotnik and J. R. Forbes, "Higher-Order Nonlinear Complementary Filtering on Lie Groups," IEEE Transactions on Automatic Control, vol. 64, no. 5, pp. 1772–1783, 2019.

K. Bergemin, D. Holden, S. Clavet, and J. R. Forbes, "DReCon: Data-Driven Responsive Control of Physics-Based Characters," SIGGRAPH Asia 2019, Brisbane, Australia, November 18-21, 2019.

D. Caverly, R. J. Caverly, and J. R. Forbes, "Periodic Tracking Control Using Gain-Scheduled Fourier Series-Based Internal Models," ASME Dynamic Systems and Control Conference, Park City, UT, October 9-11, 2019.

M.-A. Lavoie, J. Arsenault, and J. R. Forbes, "An Invariant Extended H Filter," Conference on Decision and Control, Nice, France, December 11-13, 2019. Invited session 1 on "multi-sensor fusion techniques for state estimation in navigation".

R. Fortune, C. A. Beltempo, and J. R. Forbes, "System Identification and Feedforward Control of a Fatigue Structural Testing Rig: The Single Actuator Case," 21th IFAC Symposium on Automatic Control in Aerospace (ACA 2019), Cranfield UK, August 27-30, 2019.

Z. Yin, B. Belzile, J. Angeles, and J. R. Forbes, "Elastodynamics of a Parallel Schonflies-Motion Generator," 2019 CCToMM M3 Symposium, Montreal, QC, May 16-17, 2019.

R. Chiappinelli, M. Cohen, M. Doff-Sotta, M. Nahon, J. R. Forbes, and J. Apkarian, "Modeling and Control of a Passively-Coupled Tilt-Rotor Vertical Takeoff and Landing Aircraft," International Conference on Robotics and Automation, Montreal, QC, May 20-24, 2019.

Niels van der Laan, Jonathan Arsenault, and James Richard Forbes, "The invariant Rauch-Tung-Striebel Smoother", Cahiers du GERAD, G-2019-99, December 2019

Tim Barfoot, James Forbes, David Yoong, "Exactly Sparse Gaussian Variational Inference", arXive, November 2019

Charles Champagne Cossette, Alex Walsh, and James Richard Forbes, "The complex-step derivative approximation on matrix Lie groups", Cahiers du GERAD, G-2019-80, October 2019.

Gross, Warren

DeepH. Zhou, C. Zhang, X. Tan, W. J. Gross, Z. Zhang, and X. You, "An Improved Software List Sphere Polar Decoder with Synchronous Determination," IEEE Transactions on Vehicular Technology, vol. 68, no. 6, pp. 5236-5245, June 2019.

S. C. Smithson, N. Onizawa, B. Meyer, W. J. Gross, and T. Hanyu, "Efficient CMOS Invertible Logic using Stochastic Computing," IEEE Transactions on Circuits and Systems I, vol. 66, no. 6, pp. 2263-2274, June 2019.

S. A. Hashemi, C. Condo, M. Mondelli, and W. J. Gross, "Rate-Flexible Fast Polar Decoders," IEEE Transactions on Signal Processing, vol. 67, no. 22, pp. 5689-5701, November 15, 2019.

K. Han, J. Wang, W. J. Gross, and J. Hu, "Stochastic Bit-Wise Iterative Decoding of Polar Codes," IEEE Transactions on Signal Processing, vol. 67, no. 5, pp. 1138-1151, March 2019.

F. Ercan, T. Tonnellier, C. *Condo, and W. J. Gross, "Operation Merging for Hardware Implementations of Fast Polar Decoders," Journal of Signal Processing Systems, vol. 91, no. pp. 995–1007, September 15, 2019.

F. Ercan, C. Condo, and W. J. Gross, "Improved Bit-Flipping Algorithm for Successive Cancellation Decoding of Polar Codes," IEEE Transactions on Communications, vol. 67, no. 1, pp. 61-72, October 3, 2019.

C. Condo, S. A. Hashemi, A. Ardakani, F. Ercan, and W. J. Gross, "Design and Implementation of a Polar Codes Blind Detection Scheme," IEEE Transactions on Circuits and Systems II, vol. 66, no. 6, pp. 943-947, June 2019.

W. Gross and V. Gaudet, Eds., Stochastic Computing: Techniques and Applications. Springer International Publishing, 2019, 272 Pages.

N. Onizawa, W. J. Gross, and T. Hanyu, "Brain-Inspired Computing," in Stochastic Computing: Techniques and Applications, W. Gross and V. Gaudet, Eds., Springer, 2019, pp. 185-199.

F. Leduc-Primeau, S. Hemati, V. C. Gaudet, and W. J. Gross, "Stochastic Decoding of Error-Correcting Codes," in Stochastic Computing: Techniques and Applications, W. Gross and V. Gaudet, Eds., Springer, 2019, pp. 201-215.

W. J. Gross, N. Doan, E. Ngomseu Mambou, and S. A. Hashemi, "Deep Learning Techniques for Decoding Polar Codes," in Machine Learning for Future Wireless Communications, Wiley and IEEE, 2019.

V. C. Gaudet, W. J. Gross, and K. C. Smith, "Introduction to Stochastic Computing," in Stochastic Computing: Techniques and Applications, W. Gross and V. Gaudet, Eds., Springer, 2019, pp. 1-11.

N. Onizawa, K. Nishino, S. Smithson, B. Meyer, W. Gross, H. Yamagata, H. Fujita, and T. Hanyu, "A Design Framework for Large-Scale Invertible Logic," Proceedings of the 53rd Annual Asilomar Conference on Signals, Systems, and Computers (Asilomar 2019), Pacific Grove, CA, November 3-6, 2019.

N. Onizawa, W. J. Gross, and T. Hanyu, "Stochastic-Computing Based Brainwave LSI Towards an Intelligence Edge," Proceedings of the 26th IEEE International Conference on Electronics Circuits and Systems (ICECS 2019), Genova, Italy, November 27-29, 2019.

N. Onizawa, W. J. Gross, and T. Hanyu, "Stochastic Computing for Brainware LSI," Proceedings of the 25th IEEE International Symposium on Asynchronous Circuits and Systems (ASYNC 2019), Hirosaki, Japan, May 12-15, 2019.

T. Tonnellier, A. Cavatassi, and W. J. Gross, "Length-Compatible Polar Codes: A Survey (Invited Paper)," Proceedings of the 53rd Annual Conference on Information Sciences and Systems (CISS 2019), Baltimore, MD, March 20-22, 2019, pp. 1-6.

E. Ngomseu Mambou, T. Tonnellier, S. A. *Hashemi, and W. J. Gross, "Efficient Flicker-Free FEC Codes using Knuth's Algorithm for Visible Light Communication," Proceedings of the IEEE Global Communications Conference (Globecom 2019), Waikoloa, HI, USA, December 9-13, 2019.

S. A. Hashemi, N. Doan, T. Tonnellier, and W. J. Gross, "Deep-Learning-Aided Successive-Cancellation Decoding of Polar Codes," Proceedings of the 53rd Annual Asilomar Conference on Signals, Systems, and Computers (Asilomar 2019), Pacific Grove, CA, November 3-6, 2019.

S. A. Hashemi, C. Condo, M. Mondelli, and W. J. Gross, "Rate-Flexible Fast Polar Decoders," Proceedings of the IEEE Information Theory Workshop (ITW 2019), Visby, Gotland, Sweden, August 25-28, 2019.

N. Doan, S. A. Hashemi, F. Ercan, T. *Tonnellier, and W. J. Gross, "Neural Dynamic Successive Cancellation Flip Decoding of Polar Codes," Proceedings of the IEEE International Workshop on Signal Processing Systems (SiPS 2019), Nanjing, China, October 20-23, 2019.

N. Doan, S. A. *Hashemi, E. Ngomseu Mambou, T. *Tonnellier, and W. J. Gross, "Neural Belief Propagation Decoding of CRC-Polar Concatenated Codes," Proceedings of the IEEE International Conference on Communications (ICC 2019), Shanghai, China, May 20-24, 2019, pp. 1-6.

A. Cavatassi, T. Tonnellier, and W. J. Gross, "Asymmetric Construction of Low-Latency and Length-Flexible Polar Codes," Proceedings of the IEEE International Conference on Communications (ICC 2019), Shanghai, China, May 20-24, 2019, pp. 1-6.

A. Cavatassi, T. Tonnellier, and W. J. Gross, "Fast Decoding of Multi-Kernel Polar Codes," Proceedings of the IEEE Wireless Communications and Networking Conference (WCNC 2019), Marrakech, Morocco, April 15-18, 2019, pp. 1-6.

A. Ardakani, Z. Ji, S. C. *Smithson, B. Meyer, and W. J. Gross, "Learning Recurrent Binary/Ternary Weights," Proceedings of the Seventh International Conference on Learning Representations (ICLR 2019), New Orleans, LA, May 6-9, 2019.

A. Ardakani, Z. Ji, A. *Ardakani, and W. J. Gross, "The Synthesis of XNOR Recurrent Neural Networks with Stochastic Logic," Proceedings of the 2019 Conference on Neural Information Processing Systems (NeurIPS 2019), Vancouver, BC, December 8-14, 2019.

W. J. Gross and V. C. Gaudet, "Preface," in Stochastic Decoding: Techniques and Applications (W. Gross and V. Gaudet, Eds.), p. ix, 2019.

W. J. Gross and B. Meyer, "AutoML for Machine Learning at the Edge," Huawei STW Workshop, Shenzhen, China, May 15, 2019.

W. Gross, "Polar Codes for 5G and Beyond," Workshop on Beyond-5G and 6G (Future Wireless Research), Ottawa, ON, April 15-16, 2019.

S. A. Hashemi and W. J. Gross, "Fast, Flexible, and Area-Efficient Decoders for Polar Codes," 2019 Information Theory and Applications Workshop, San Diego, CA, February 10-15, 2019.

F. Ercan, T. Tonnellier, and W. J. Gross, "Energy-Efficient Polar Decoders for 5G and Beyond," McGill Engineering Competition, Montreal, November 9-10, 2019.

F. Ercan, T. Tonnellier, and W. J. Gross, "Energy-Efficient Polar Decoders for 5G and Beyond," The Sixth IEEE Research Boost, Montreal, October 30, 2019.

A. Cavatassi, W. J. Gross, and B. Meyer, "Automated Neural Network Architecture Search for Low-Cost Keyword Spotting," TinyML Summit, Sunnyvale, CA, March 20-21, 2019.

W. Gross and N. Onizawa, "Methods and Systems for Network Address Lookup Engines," US Patent US 10,469,235 B2, Granted November 5, 2019.

C. Leroux, W. J. Gross, P. Giard, and G. Sarkis, "Systematic Encoding of Polar Codes without an interleaver," US 10,193,578, Granted January 29, 2019.

P. Giard, G. Sarkis, W. Gross, and C. Thibeault, "Multi-Mode Unrolled Polar Decoders," US 10,305,514 Patent, Granted May 28, 2019.

Y. El-Kurdi, W. J. Gross, and D. Giannacopoulos, "Parallel Processing of the Finite Element Method Using Gaussian Belief Propagation Algorithm on Factor Graphs," US Patent, Granted August 27, 2019.

Liu, Xue

F. Tan, L. Liu, S. Winter, Q. Wang, N. Suri, L. Bu, Y. Peng, X. Liu, X. Peng: "Cross-Domain Noise Impact Evaluation for Black Box Two-Level Control CPS". ACM TCPS 3(1): 2:1-2:25 (2019)

C.M. Tseng, S. C. Chau, X. Liu: "Improving Viability of Electric Taxis by Taxi Service Strategy Optimization: A Big Data Study of New York City". IEEE Trans. Intelligent Transportation Systems 20(3): 817-829 (2019)

J. Yao, T. Deng, X. Liu, H. Jacobsen, H. Guan: "HyperCo: Optimizing Network Performance in ARM-Based Mobile Virtualization". IEEE Trans. Services Computing 12(1): 131-143 (2019)

F. Kong, X. Lu, X. Liu: "Distributed Data Center Bandwidth Allocation for Cloud-Based Streaming." T-SUSC 4(2): 263-276 (2019)

X. Chen, Q. Xiang, L. Kong , X. Liu RadioLoc: Learning Vehicle Locations with FM Signal in All-Terrain Environments, in IEEE MASS 2019 (Best Paper Award)

X. Liu, Y. Hua, X. Liu, L. Yang, Y. Sun: Smoother: A Smooth Renewable Power-Aware Middleware. ICDCS 2019: 249-260

J. Huang, L. Kong, G. Chen, L. Cheng, K. Wu, X. Liu: B-IoT: Blockchain Driven Internet of Things with Credit-Based Consensus Mechanism. ICDCS 2019: 1348-1357

J. Oyedokun, S. Bu, Z. Han, X. Liu: Customer Baseline Load Estimation for Incentive-Based Demand Response Using Long Short-Term Memory Recurrent Neural Network. ISGT Europe 2019: 1-5

C. Ma, P. Kang, X. Liu: Hierarchical Gating Networks for Sequential Recommendation. ACM KDD 2019: 825-833

C. Ma, P. Kang, B. Wu, Q. Wang, X. Liu: Gated Attentive-Autoencoder for Content-Aware Recommendation. WSDM 2019: 519-527

Y. Ban, X. Liu, L. Huang, Y. Duan, X. Liu, W. Xu: No Place to Hide: Catching Fraudulent Entities in Tensors. WWW 2019: 83-93

S. Liu, N. Guan, D. Ji, W. Liu, X. Liu, W. Yi: Leaking your engine speed by spectrum analysis of real-Time scheduling sequences. Journal of Systems Architecture - Embedded Systems Design 97: 455-466 (2019)

Z. Feng, N. Guan, M. Lv, W. Liu, Q. Deng, X. Liu, W. Yi: An Efficient UAV Hijacking Detection Method Using Onboard Inertial Measurement Unit. ACM Trans. Embedded Comput. Syst. 17(6): 96:1-96:19 (2019)

J. Huang, L. Kong, G. Chen, M. Wu, X. Liu, P. Zeng: Towards Secure Industrial IoT: Blockchain System With Credit-Based Consensus Mechanism. IEEE Trans. Industrial Informatics 15(6): 3680-3689 (2019)

Y. Yao, B. Xiao, G. Wu, X. Liu, Z. Yu, K. Zhang, X. Zhou: Multi-Channel Based Sybil Attack Detection in Vehicular Ad Hoc Networks Using RSSI. IEEE Trans. Mob. Comput. 18(2): 362-375 (2019)

S. Muhammad, M. Usman Rafique, S. Li, Z. Shao, Q. Wang, X. Liu: "Reconfigurable Battery Systems: A Survey on Hardware Architecture and Research Challenges". ACM Trans. Design Autom. Electr. Syst. 24 (2): 19:1-19:27 (2019)

P. Zuo, Y. Hua, Y. Sun, X. Liu, J. Wu, Y. Guo, W. Xia, S. Cao, D. Feng: "Bandwidth and Energy Efficient Image Sharing for Situation Awareness in Disasters". IEEE Trans. Parallel Distrib. Syst. 30(1): 15-28 (2019)

Y. Hua, X. Liu: "Searchable Storage in Cloud Computing". Springer 2019, ISBN 978-981-13-2720-9, pp. 1-204

X. Liu, P. Tabuada, M. Pajic, L. Bushnell: Proceedings of the 10th ACM/IEEE International Conference on Cyber-Physical Systems, ICCPS 2019, Montreal, QC, Canada, April 16-18, 2019. ACM 2019, ISBN 978-1-4503-6285-6

X. Ge, J. Thompson, Y. Li, X. Liu, W. Zhang, T. Chen: "Applications of Artificial Intelligence in Wireless Communications". IEEE Communications Magazine 57 (3): 12-13 (2019)

Misra, Arun

Jean, I., Misra, A.K. and Ng., A. (2019). "Solar radiation pressure - compatible trajectories in the vicinity of a binary asteroid". Journal of the Guidance, Control, and Dynamics. Vol. 42, No. 6, pp. 1319 - 1329.

Jean, I., Ng., A. and Misra, A.K. (2019). "Impact of solar radiation pressure modeling on orbital dynamics in the vicinity of asteroids". Acta Astronautica. Vol.165, pp. 167 - 183.

Naveen, B., Shah, S.V. and Misra, A.K. (2019). "Momentum model-based minimal parameter identification of a space robot". Journal of Guidance, Control, and Dynamics. Vol. 42, No. 3, pp. 508 - 523.

Abdelbaki, A.R., Paidoussis, M.P. and Misra, A.K. (2019). "A nonlinear model for a hanging tubular cantilever simultaneously subjected to internal and confined external axial flows". Journal of Sound and Vibration. Vol. 449, pp. 349 - 367.

Yang, K., Misra, A.K., Zhang, J., Qi, R. Lu, S. and Liu, Y. (2019). "Dynamics of a debris towing system with hierarchical tether architecture". Acta Astronautica. doi.org/10.1016/j.actaastro.2019.10.048.

Jean, I., Misra, A.K. and Ng, A. "Design and control of spacecraft trajectories in the full restricted three body problem". AAS/AIAA Astrodynamics Specialists Conference, Portland, ME, August 11-15, 2019, Paper No. AAS 19 - 637.

Yang, K., Misra, A.K., Qi, R., Lu, S., Liu, Y. and Zhang, J. "Dynamics of a debris towing system with hierarchical tether architecture". 6th International Conference on Tethers in Space (TiS 2019), Madrid, Spain, June 12-14, 2019.

Paidoussis, M.P., Abdelbaki, A.R., Javed Butt, M.F., Moditis, K., Misra, A.K. and Nahon, M. "Dynamics of a pipe subjected to internal and confined external flow". Proceedings of the ASME 2019 Pressure Vessel and Piping Confernce, San Antonio, TX, July 14-19, 2019, PVP 2019-93227.

Jean, I., Misra, A.K. and Ng, A. "Impact of the variation of the modelling of a binary asteroid system on the restricted three body problem". 70th International Astronautical Congress, Washington, DC, October 21-25, 2019, Paper No. IAC-19, C1.3.6.

Cohen, S., Misra, A.K., Vieira, T., Rinaldi, R. and Ziegahn, R. "Space elevator dynamic response to payload release". 70th International Astronautical Congress, Washington, DC, October 21-25, 2019, Paper No. IAC-19, D4.3.9.

Abdelbaki, A.R., Paidoussis, M.P. and Misra, A.K. "Nonlinear dynamics of a hanging cantilevered pipe discharging fluid with external flow over its upper portion". 27th Canadian Congress of Applied Mechanics (CANCAM 2019), Sherbrooke, QC, May 27-30, 2019.

Jean, I., Misra, A.K. and Ng, A. "Spacecraft trajectories in the vicinity of a binary asteroid system, an overview of the Free Restricted Three Body Problem". CASI ASTRO, Laval, QC, June 17-19, 2019.

Mongrain, Rosaire

Frattolin J, Roy R, Rajagopalan S, Walsh M, Yue S, Bertrand OF, Mongrain R., "A manufacturing and annealing protocol to develop a cold-sprayed Fe-316L stainless steel biodegradable stenting material", Acta Biomater S1742-7061(19)30590-2, doi: 10.1016/j.actbio.2019.08.034, 2019

Mohammadi H, Cartier R, Soulez G, Mongrain R, "Numerical study of multivessel coronary plaque hemodynamics", International Journal for Computational Methods in Engineering Science and Mechanics, doi.org/10.1080/15502287.2019.1655503, 2019

Javid F, Shahmansouri N, Angeles J, Mongrain R, "Fatigue Exhaustion of the Mitral Valve Tissue", Biomech and Modeling in Mechanobilogy, 18(1): 89-97, doi.org/10.1007/s10237-018-1070-3, 2019

Cahalane RM, Broderick SP, Kavanagh EG, Moloney MA, Mongrain R, Purtill H, Walsh MT, O'Brien JM, "Comparative analysis of calcification parameters with Agatston Score approximations for ex vivo atherosclerotic lesions", J Cardiovasc Comput Tomogr, S1934-5925(19)30114-5. doi: 10.1016/j.jcct.2019.07.003, 2019

Mongrain R, "From blood flow to pressure: Paradigm shift !", AIMRADIAL & PCI 2019, Chicago October 18, 2019

Mongrain R, Zikry C, Cartier R, Soulez G, Viscoelastic "Characterization of Dacron Graft and Aortic Tissue", M2D 2019, 8th International Conference, Mechanics and Materials in Design, University of Bologna, 4-6 September, 2019

Mongrain R, Leask R, Walsh M, Amabili M, Paidoussis M, Butany J, Bertrand OF, Cartier R, Cecere R, Lachapelle K, El-Hammansy I, Bouchot O, Tardif JC, Soulez G, "Thoracic aorta modeling: a Quebec experience", F.IR.E Future of Interventional Radiology Expert Panel 2019, Marseille November 21-22, 2019

Mongrain R, Cecere R, Cartier R, Bertrand OF, "Adaptation of the engineering design process to medical implants", M2D 2019, 8th International Conference, Mechanics and Materials in Design, University of Bologna, 4-6 September, 2019

Ulacia P, Gilbert L, Galaz R, Mongrain R, "Designing a Hybrid Sampler for Gynecological Cancer Screening", M2D 2019, 8th International Conference, Mechanics and Materials in Design, University of Bologna, 4-6 September, 2019

Ulacia P, Gilbert L, Mongrain R, "Three-dimensional Reconstruction of the Female Pelvic Organs for Biomechanical Modeling", M2D 2019, 8th International Conference, Mechanics and Materials in Design, University of Bologna, 4-6 September, 2019

Mongrain R, He Z, Leask R, Bertrand OF, Cartier R, Soulez G, "Development of PVA models for biomechanical and biophysical in-vitro simulations", 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and the 4th Conference on Imaging and Visualization, New York, USA, June 14-16, 2019

McKean A, Cecere R, Pagiatakis C, Mongrain R, "Development of a new hemolysis model", 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and the 4th Conference on Imaging and Visualization, New York, USA, June 14-16, 2019

Mohammadi H, Zikry C, Cartier R, Soulez G, Mongrain R, "A study of the impact of viscoelasticity on aortic wall stress", ICoNSoM 2019, International Conference on Nonlinear Solid Mechanics, Roma, Italy, 16-19 June 2019

Shamshiri M, Mongrain R, Mongeau L, "Computational study of the evolution of vortical flow structures through the blood-feeding arteries of the human vocal folds and its potential impact on drug delivery for laryngeal cancer", 48th Symposium The Voice Foundation, Philadelphia, USA, May 29-June 2, June 2019

Zikry C, Soulez G, Cartier R, Mongrain R, "Relation between Smooth Muscle Content and Energy Loss in Healthy and Aneurysmal Aortic Tissue", ICoNSoM 2019. International Conference on Nonlinear Solid Mechanics, Roma, Italy, 16-19 June 2019

Shamshiri M, Mongrain R, Mongeau L, "Numerical study of the influence of vascular morphology on the evolution of vortical flow structures through the blood-feeding arteries of the human vocal folds: application to drug delivery for laryngeal cancer", AQL Montreal, The 13th International Conference on Advances in Quantitative Laryngology, Voice and Speech Research, June 2-4, 2019

Al-Roujayee S, Mongrain R, Meunier JK, Cecere R, "Designing and fabricating biodegradable stent as an effective alternative to conventional metallic stent for coronary disease treatment", Experimental Surgery Research Day, on McGill University, Montreal, Qc, November 22nd, 2019

USPTO Provisional Patent, "Intrauterine sample collection device and method of using same", L Gilbert, R Mongrain, I Ragoussis, CMT Greenwood

Panangaden, Prakash

Florence Clerc, Nathanaël Fijalkow, Bartek Klin, Prakash Panangaden: "Expressiveness of probabilistic modal logics: A gradual approach". Inf. Comput. 267: 145-163 (2019)

Linan Chen, Florence Clerc, Prakash Panangaden: "Bisimulation for Feller-Dynkin Processes". MFPS 2019: 45-63

Philip Amortila, Marc G. Bellemare, Prakash Panangaden, Doina Precup: "Temporally Extended Metrics for Markov Decision Processes". SafeAI@AAAI 2019

Borja Balle, Prakash Panangaden, Doina Precup: "Singular value automata and approximate minimization". Mathematical Structures in Computer Science, 29(9), 1444-1478, 2019.

Appendix II: Associate Presentations

Armanfard, Narges

"Dimensionality reduction for time series data analysis", Preteckt Inc., Hamilton, ON., Canada.

"Dimensionality reduction for data clustering and classification", Ericsson, Montreal, QC., Canada.

"Machine learning for Manufacturing Technologies", Algoma Steel, Sault Ste. Marie, ON., Canada.

"Machine learning for healthcare applications", Centre for Intelligent Machines, McGill University.

Cheung, Jackie Chi Kit

"Commonsense Reasoning for Natural Language Processing Systems". Simon Fraser University. Dec 17, 2019.

"Commonsense Reasoning for Natural Language Processing Systems". University of British Columbia. Dec 13, 2019.

"Natural Language Processing for Legal Text Analysis. Cyberjustice Lab". University of Montreal. December 3, 2019.

"New Directions in Automatic Text Summarization". Huawei NLP Workshop. Nov 15, 2019.

"New Directions in Automatic Text Summarization". Samsung AI Forum. Seoul, South Korea. Nov 4, 2019.

"New Directions in Automatic Text Summarization". Mila NLP Workshop. Sept 17, 2019.

"New Directions in Automatic Text Summarization". Borealis AI Research Retreat. Kelowna, BC. June 25, 2019.

"Commonsense Reasoning for Natural Language Processing Systems". Dalhousie University. June 13, 2019.

Forbes, James Richard

System Identification and Optimal Control of a Fatigue Testing Rig for Aircraft, Optimization Days, May 14-15, 2019.

Gross, Warren

W. J. Gross and B. M. Meyer, "Tutorial on Optimizing Machine Learning for Hardware," 28th Conference on Electrical Performance of Electronic Packaging and Systems (EPEPS 2019), Montreal, QC, October 6, 2019.

"Machine Learning for Channel Coding," Symposium on Artificial Intelligence for Future Wireless Communication, 7th IEEE Global Conference on Signal and Information Processing (GlobalSIP 2019), Ottawa, ON, November 12, 2019.

"Machine Learning at the Edge," 25th IEEE International Symposium on Asynchronous Circuits and Systems (ASYNC 2019), Hirosaki, Japan, May 13, 2019.

"Machine Learning at the Edge," University of Toronto, Toronto, Ontario, April 5, 2019.

Liu, Xue

Keynote, October 22nd, 2019, "AI for Systems, Systems for AI", in IEEEIFIP 15th International Conference on Network and Service Management (CNSM 2019), Halifax, Canada.

November 5, 2019, Samsung AI Forum 2019, Seoul, South Korea, "When Machine Learning Meets Wi-Fi: Robust Device-Free Indoor Localization"

Panel, April 15th, 2019, "Future of Social Sensing", in SocialSens 2019: Fourth International Workshop on Social Sensing, Montreal, Canada. In conjunction with the ACM/IEEE CPSWeek

June 21, 2019, Seoul National University, Seoul, South Korea "Taming the Inconsistency of Wi-Fi Fingerprints for Device-Free Passive Indoor Localization''

June 17, 2019, ACM Open IoT Day, Seoul, South Korea "Embracing Ubiquitous Connectivity and AI: The Next

Mongrain, Rosaire

PLENARY SPEAKER, "Thoracic aorta modeling: a Quebec experience", F.IR.E Future of Interventional Radiology Expert Panel 2019, Marseille Nov 21-22, 2019

KEYNOTE SPEAKER, "Hemodynamics Primer in the 8th AIM-RADIAL" (http://aimradial.org/aimradial.org/FFR.html, invited by Dr OF Bertrand), Oct 16-18, Chicago, USA, 2019

INVITED SPEAKER, 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, New York, USA, (invited by Prof A Robertson), June 14-16, 2019

Panangaden, Prakash

Invited speaker at the workshop on Learning Automata June 2019, Vancouver, BC.

Appendix III: Associate Grants

Grant	Total Funding	2019 Amount
NSERC Discovery	$ 1,362,000	$ 272,400
NSERC CRD	$ 2,017,047	$ 481,212
Other NSERC	$ 1,230,705	$ 305,529
MITACS	$ 322,500	$ 271,945
FQRNT	$ 242,111	$ 73,216
Federal	$ 1,760,576	$ 467,692
Industrial Partnerships	$ 1,635,743	$ 574,123
Total	**$ 8,570,682**	**$ 2,446,116**

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