Centre for Intelligent Machines

Annual Report 2020
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Message from the Director

For the better part of four decades, members of the CIM community have contributed to many impressive achievements across a diversity of academic communities, building a shared history we all continue to be proud part of. In the wake of 2020, a year that unexpectedly plunged our society into challenges of a truly unique magnitude, I was touched to see CIM members supporting each other’s well-being, and this whilst contributing to the scientific challenges laid forth by COVID-19.

In approaching the new academic year, I am cautiously optimistic that a return to campus life -- and, of course, to CIM -- will further strengthen our academic community. In a celebration of community, staff will renew their efforts at building and delivering a new set of group-oriented events: coffee and snack breaks, research and collaborative brainstorming workshops, team-building events and socials. Our goal here is to provide regular and frequent opportunities to see each other and engage in old fashioned discussions: a collective Zoom detox of sorts.

I am happy to announce that the new academic year brings with it the onboarding of many new Associate and Full members to our team, each bringing a unique perspective that I’m excited to see flourish in our Centre.

Building atop the momentum of the development and deployment of our newly-branded CIM website, which included a modern rethinking of our Centre’s logo, we also kicked-off our regular digital newsletter series. These e-mail updates ground our many accomplishments and impact, both within and outside of the academy, and serve to highlight the many ways the Centre’s members continue to change the world for the better.

Benefiting from a growing collaboration between the Centre and our University Advancement team, CIM’s Industrial Liaison Program was successfully accredited in 2020 and will be signing on its first few members in the near future. In addition to increasing the Centre’s autonomy, the ILP will usher in a new way of engaging in successful industrial research collaborations for our members and their HQP. I wait in eager anticipation of its deployment and look forward to reporting on its success thereafter.

Of course, none of the aforementioned advances would have been possible without the collaboration of our member and the hard work and dedication of our CIM staff. As many of you know, Jan Binder -- our long-time head of IT -- has been on medical leave for the better part of the past 18 months. CIM staff have rallied together to continue to provide a high level of support and to service our community in his absence (and through the added fog of COVID). This year will continue to see an evolution in the ways in which we can better serve our community’s evolving needs.

I express my heartfelt thanks to the entirety of the CIM community and I very much look forward to seeing you all soon.

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.

2020 Board Members

Derek Nowrouzezahrai – Centre Director, Board Chair
James Nicell – Dean, Faculty of Engineering
Bruce Lennox – Dean, Faculty of Science
Christopher Manfredi – Provost & Vice Principal, Academic
Martha Crago – Vice Principal, Research and Innovation
Gregory Dudek – Centre Member
Frank Ferrie – Centre Member
Kaleem Siddiqi – Alternate Centre Member
Pierre Breton – External Member, Executive Vice President, KW! Polymers
Mohamad Afsari – Graduate Student

Support Staff

Marlene Gray – CIM Manager
Jan Binder – Systems Manager (on leave)
Nick Wilson – Systems Administrator
Chelsea Rogers – Communications Associate
Overview of Centre

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 Centre is comprised of 22 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 22 full members, at the end of 2020 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.
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
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

Hsiu-Chin Lin
School of Computer Science & Department of Electrical and Computer Engineering
Prof. Hsiu-Chin Lin is joining CIM as an Associate member. Her research is in the fields of robotics and machine learning for motor control. Prof. Lin’s research interests focus on enabling robots to assist humans in everyday activities by studying motion-based control, optimization, and robot motion especially for robot arms and quadruped robots.

AJung Moon
Department of Electrical and Computer Engineering
Prof. AJung Moon is the director of the McGill Responsible Autonomy & Intelligent System Ethics (RAISE) lab and is joining CIM as an Associate member. Prof. Moon investigates how robots and AI systems influence the way people move, behave, and make decisions in order to inform how autonomous intelligent systems can be designed and deployed more responsibly.

Audrey Sedal
Department of Mechanical Engineering
Prof. Audrey Sedal is joining CIM as an Associate member. She specializes in soft robotics and embodied intelligence. Prof. Sedal has worked on the development of auxetic materials that can be used in the design of soft robots. Her research uses first principles-based and data-driven models to predict behaviours and develop robots that can provide useful help to humans.
Students

82 Undergrads

86 Ph.D.s

19 Postdocs

85 Masters
### Seminars

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<thead>
<tr>
<th>Name</th>
<th>University</th>
<th>Location</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>Ryad Benosman</td>
<td>University of Pittsburgh Medical Center, Carnegie Mellon University and Sorbonne Universités</td>
<td>USA</td>
<td>What is Neuromorphic Event-based Computation and Why it is the future of AI?</td>
</tr>
<tr>
<td>Louis Collins</td>
<td>McGill University</td>
<td>Canada</td>
<td>Image guided neurosurgery at the MNI</td>
</tr>
<tr>
<td>Laurent Dinh</td>
<td>Google Brain</td>
<td>Canada</td>
<td>A RAD approach to deep mixture models</td>
</tr>
<tr>
<td>Ahmed Farooq</td>
<td>Tampere Unit for Computer-Human Interaction (TAUCHI), Tampere University, Finland and Purdue University, Indiana</td>
<td>USA</td>
<td>Analyzing Haptic Feedback: &quot;Haptic Mediation&quot;</td>
</tr>
<tr>
<td>Francois Hogan</td>
<td>Samsung Research AI Center, Montreal</td>
<td>Canada</td>
<td>Towards Reactive Manipulation Skills</td>
</tr>
<tr>
<td>Maxime Laborde</td>
<td>McGill University</td>
<td>Canada</td>
<td>Systems of Evolution Equations Coupled Through Optimal Transport and Application to Urban Planning</td>
</tr>
<tr>
<td>Archana Venkataram</td>
<td>Neural Systems Analysis Laboratory, Johns Hopkins University</td>
<td>USA</td>
<td>Generative-Deep Hybrid Models to Decipher Brain Functionality</td>
</tr>
<tr>
<td>Vassili N. Kokolosov</td>
<td>Department of Statistics, University of Warwick</td>
<td>England</td>
<td>Quantum Mean Field Games: Part 1 &amp; Part 2</td>
</tr>
<tr>
<td>Daniel Lacker</td>
<td>Industrial Engineering &amp; Operations Research, Columbia University</td>
<td>USA</td>
<td>A case study on stochastic games on large graphs in mean field and sparse regimes</td>
</tr>
<tr>
<td>Abhishek Gupta</td>
<td>Electrical and Computer Engineering, The Ohio State University</td>
<td>USA</td>
<td>Stochastic Recursive Algorithms: A Markov Chain Perspective</td>
</tr>
<tr>
<td>Yurii Averboukh</td>
<td>Krasovskii Institute of Mathematics and Mechanics &amp; HSE</td>
<td>Russia</td>
<td>Control Theory Viewpoint to the Finite State Mean Field Games</td>
</tr>
<tr>
<td>Utsav Sadana</td>
<td>Department of Decision Sciences, HEC Montreal</td>
<td>Canada</td>
<td>Open-loop Nash Equilibria in Nonzero-sum Differential Games with Impulse Controls</td>
</tr>
<tr>
<td>Dileep Kalathil</td>
<td>Department of Electrical and Computer Engineering, Texas A&amp;M University</td>
<td>USA</td>
<td>Reinforcement Learning with Robustness and Safety Guarantees</td>
</tr>
<tr>
<td>Fabio Pasqualetti</td>
<td>Department of Mechanical Engineering, University of California, Riverside</td>
<td>USA</td>
<td>Synchronization Patterns in Networks of Kuramoto Oscillators for the Analysis and Control of Dynamic Functional Connectivity</td>
</tr>
<tr>
<td>Minyi Huang</td>
<td>School of Mathematics and Statistics, Carleton University</td>
<td>Canada</td>
<td>Linear-Quadratic Mean Field Games with a Major Player: Nash Certainty Equivalence versus Master Equations</td>
</tr>
<tr>
<td>David Métivier</td>
<td>École Polytechnique</td>
<td>France</td>
<td>Mean Field Control and Disorder for Efficient Mixing of Energy Loads</td>
</tr>
<tr>
<td>Archana Venkataram</td>
<td>John Hopkins University</td>
<td>USA</td>
<td>Deep Learning for Multimodal and Dynamic Functional Neuroimaging</td>
</tr>
<tr>
<td>Mehdi Salimi</td>
<td>McMaster University</td>
<td>Canada</td>
<td>Winning strategy for pursuers in pursuit-evasion differential games</td>
</tr>
<tr>
<td>Kevin Church</td>
<td>McGill University</td>
<td>Canada</td>
<td>Floquet Theory, Invariant Manifolds and Control with Impulsive Delay Differential Equations</td>
</tr>
<tr>
<td>William Hamilton</td>
<td>McGill University</td>
<td>Canada</td>
<td>Graph Representation Learning: Recent Advances and Open Challenges</td>
</tr>
<tr>
<td>Dena Firoozi</td>
<td>HEC Montréal</td>
<td>Canada</td>
<td>Belief Estimation by Agents in Major-Minor LQG Mean Field Games</td>
</tr>
<tr>
<td>Ozgen Karaer</td>
<td>Middle East Technical University</td>
<td>Turkey</td>
<td>Supplier development in a multi-tier supply chain</td>
</tr>
<tr>
<td>Shuang Gao</td>
<td>McGill University</td>
<td>Canada</td>
<td>Subspace Decompositions in Graphon Control and Graphon Mean Field Games</td>
</tr>
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Awards

Tal Arbel is awarded a Canada CIFAR AI Chair, as an associate faculty member of MILA. This appointment is awarded by the Canada CIFAR AI Chairs Program and is worth $500,000, starting on January 1, 2020 and lasting until January 1, 2025. The award provides $50,000 per year in research funding (of which $10,000 is allocated for covering teaching relief of one course per year) and $50,000 per year in salary award.

Prof. Arbel started new journal in 2020, the Journal on Machine Learning for Biomedical Image Analysis (MELBA) for which she also serves as Editor-in-Chief. MELBA is the first journal to formally bridge the gap between the machine learning and biomedical imaging communities.

Peter Caines was featured in the IEEE Control Systems Society Magazine in December, 2020 and members of the Mobile Robotics Lab.

David Meger received a best paper at the RSS Workshop on Self-Supervised Robot Learning for his work entitled “Self-Supervised, Goal-Conditioned Policies for Navigation in Unstructured Environments”, written in collaboration with CIM member Gregory Dudek and members of the Mobile Robotics Lab.

Meyer Nahon has a Google Scholar h-index of 40, total citations >5000 which is among the highest in the Department of Mechanical Engineering. 


Prof. Nowrouzezahrai is the first full-time tenure-track faculty member from the Faculty of Engineering to be appointed as a Core Academic Faculty member in the Quebec Institute for Artificial Intelligence (Mila). His research program and NSERC/Ubisoft Industrial Research Chair collaborations were featured on the McGill website and the website of the Vice-Principal’s Office for Research and Innovation.

Joelle Pineau was renewed for a second term as a William Dawson Scholar chair, which recognizes a scholar developing into an outstanding and original researcher of world-class caliber who is poised to become a leader in his or her field.

Kaleem Siddiqi was awarded an NSERC Discovery Accelerator Supplement for his work on “Diffusion and Geometry in Biological Tissue”. This award is valued at $40,000 per year for 3 years and he is the Principal investigator. This is his second DAS.

Associate Awards

James Forbes is the winner of the Carrie M. Derick Award for Graduate Supervision and Teaching, awarded in April 2020. This award acknowledges outstanding contributions to promoting graduate student excellence through supervision and teaching by a faculty member who has been supervising for 10 years or less. Warren Gross is a Louis-Ho Faculty Scholar in Technological Innovation, 2018-present.

Prof. Gross’ graduate student, Furkan Ercan, won 3rd place at the Quebec Engineering Competition for his poster and presentation entitled “Energy-Efficient Polar Decoders for 5G and Beyond”.

Jackie Cheung received an Outstanding reviewer award at the Annual meeting of the Association for Computer Linguistics (ACL) in 2020.

Prof. Cheung won the Best Poster Award, awarded at the We Robot 2020 Conference, Sept. 25, 2020 which included a prize of $500.00 CAD.

Professor Cheung was awarded the Peter Silvester Faculty Research Award in Electrical and Computer Engineering, McGill University on Apr. 6, 2020 ($2,500.00 CAD).

Prakash Panangaden was selected as Fellow of the Association for Computing Machinery – the most prestigious distinction for members of the ACM, which is the premier professional body for computer science.

Peter Caines in Dec 2020. IEEE magazine
The Innovate series features organizations who have contributed to the technological and social development of industries in different areas. The most recent edition featuring Artificial intelligence in Quebec included a feature on the Centre for Intelligent Machines. The book is published by Global Village Ventures and edited by Quebec’s Chief Innovation Officer, Luc Sirois.

CIM proves that it is an integral part of the AI ecosystem in Quebec, as we have established research partnerships with many of the companies, institutions and universities featured in the publication. Over the years, Quebec has become a hub for Artificial intelligence research and CIM counts itself as a significant contributor to this progress.

In 2020, CIM underwent a rebranding initiative which included the development of a new logo and the migration of the web portal to the McGill WMS platform. This change took place in order to provide a modern look and feel to CIM’s online presence. The new website features updated profiles on our members, information on the labs and research facilities at CIM, and information on how prospective students and industrial partners can get involved and work with CIM. The Centre for Intelligent Machines has been a driving force in research on intelligent systems since 1985. A new logo was developed in 2020 to illustrate this intersection of brain and machine. The sleek design brings a modern sense of style to CIM’s brand.
Industrial Partnerships

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. Industry partners are invited to CIM’s Student Research Showcase events and a CV bank is being developed to facilitate the recruitment of students.

The following companies are among those who have partnered with CIM as industrial affiliates or have collaborated with CIM researchers on research projects or contracts.
The regroupement REPARTI - Systèmes cyberphysiques et intelligence machine matérialisée (Cyberphysical Systems and Embedded Machine Intelligence) Systèmes cyberphysiques et intelligence machine matérialisée (Cyberphysical Systems and Embedded Machine Intelligence) (April 2019 - March 2025) is a $2.9M inter-institutional, interdisciplinary collaborative venture comprised of six 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.

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 (ETS).

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

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.

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.

The institutions participating in REPARTI are:
- Université Laval (host institution)
- McGill University
- Université de Sherbrooke
- École Polytechnique
- Université de Montréal
- École de technologie supérieure (ETS)

Funding Sources

An important source of funding is the Natural Sciences and Engineering Research Council of Canada (NSERC). This federal funding includes a wide variety of programs such as Discovery Grants, Engage Grants, Collaborative Research and Development Grants among others. Some programs include industrial contracts which allow researchers to work with companies to solve existing problems or innovate to create new technologies.

Provincial programs also play an important role. In addition to funding REPARTI, the Fonds de recherche du Québec - Nature et technologies (FRQNT) also provides funding to individual CIM members for their research activities. Several members are part of other Regroupement Stratégiques including GERAD and CIRMMT, which gather researchers from many institutions to further common research goals within certain thematic areas.

MITACS is an innovative program that pairs companies with students seeking research experience. It provides funding for projects that enable companies to hire post-secondary students who gain real-world experience and help solve industry challenges.

The NSERC Canadian Robotics Network (NCRN) is a Canada-wide network which 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 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.
Funding

CIM receives funding from a variety of sources including federal and provincial grants as well as industrial grants and research contracts. A significant part of funding comes from the Natural Sciences and Engineering Research Council (NSERC) which includes Discovery Grants, Engage Grants, Collaborative Research and Development grants and Industrial Research Chairs. Provincial funding comes from the Fonds de Recherche du Québec - Nature et Technologies (FRQNT) and other agencies.

CIM has formed research partnerships with numerous companies who support research projects through grants, research contracts and partnerships with federal and provincial agencies. As a result, CIM is able to carry out cutting-edge research that advances scientific knowledge and creates the technologies of the future.

<table>
<thead>
<tr>
<th>Grant Sources</th>
<th>Total Funds</th>
<th>2020 Amount</th>
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<tbody>
<tr>
<td>NSERC Discovery</td>
<td>$4,777,480</td>
<td>$955,980</td>
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<tr>
<td>NSERC CRD</td>
<td>$2,114,173</td>
<td>$725,265</td>
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<tr>
<td>NSERC Engage</td>
<td>$103,999</td>
<td>$91,499</td>
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<tr>
<td>Other NSERC</td>
<td>$1,965,944</td>
<td>$465,944</td>
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<tr>
<td>Federal</td>
<td>$1,092,626</td>
<td>$817,033</td>
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<tr>
<td>MITACS</td>
<td>$665,000</td>
<td>$420,000</td>
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<tr>
<td>FRQNT</td>
<td>$343,070</td>
<td>$122,023</td>
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<tr>
<td>Other Provincial</td>
<td>$584,881</td>
<td>$270,507</td>
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<tr>
<td>Industrial</td>
<td></td>
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<tr>
<td>Partnerships</td>
<td>$5,023,090</td>
<td>$1,587,937</td>
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<td>Other Funding</td>
<td>$1,017,072</td>
<td>$351,115</td>
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<td><strong>Total</strong></td>
<td><strong>$17,687,335</strong></td>
<td><strong>$5,807,302</strong></td>
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<tr>
<th>Infrastructure Funds</th>
<th>Total Funds</th>
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<tr>
<td>REPARTI</td>
<td>$2,880,000</td>
<td>$158,000</td>
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<tr>
<td>NCRN</td>
<td>$8,727,000</td>
<td>$87,270</td>
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2020 Funding Sources

- NSERC Discovery
- NSERC CRD
- NSERC Engage
- Other NSERC
- Other Provincial
- Industrial Partnerships
- FRQNT
- MITACS
- Federal
- Other Funding
### Publications

**Arbel, Tal**


**Boulet, Benoit**


Q. Dang, D. Wu, B. Boulet, “EV Charging Management with ANN-Based Electricity Price Forecasting” IEEE Transportation Electrification Conference, June 24-26, 2020, Chicago, IL.

**Caines, Peter**


P.E. Caines, “Mean Field Game Theory: A Tractable Methodology for Large Population Problems”, SIAM News, April, 2020, pp 5-6


**Clark, James**


Cooperstock, Jeremy


Dudek, Gregory


Kry, Paul


Langer, Michael

Perception of a black room seen through a


**Meger, David**


**Misra, Arun**


Misra, A.K. and 4 others, Round-Table on On-Orbit Servicing, 3rd IAA/AAS SciTech Forum, Moscow, Russia, December 2020.

Nahon, Meyer


Pineau, Joelle


**Sharf, Inna**


Siddiqi, Kaleem


Invited Talks

Arbel, Tal
2020 Conference on Medical Imaging with Deep Learning (MIDL), Special Issue of RSIP, Interview with PCs, https://rsipvision.com/MIDL2020/
Boulet, Benoit
SERI Montreal video presentation on transport electrification and our work on electric vehicles at the Intelligent Automation Lab.

Caines, Peter
GERAD Montreal «Un chercheur du GERAD parle..» 10th February, 2020
IPAM: Institute of Pure and Applied Mathematics, UCLA, “Graphon Mean Field Games” 7th May, 2020

Clark, James
Talk at the UBC Lab for Computational Intelligence, January 2020.

Cooperstock, Jeremy
“From flight simulators to the passenger experience: what can we learn from pilot-training tools to improve airline customer service”, AIST-NRC Collaboration Meeting on Improving Client-Agent Interaction, January 17, 2020.

Dudek, Gregory
Acted as invited speaker and/or moderator of multiple international robotics workshops and meetings (all held virtually) including: the World Symposium on AI, the Robotics Debates sponsored by the Robotics and Automation Society, the IFRR Robotics Global Colloquia, Samsung AI boot camp, Current progress in Applied Reinforcement Learning Invited panelist, NeurIPS workshop in AI for Climate Change Invited seminar, Singapore University of Technology and Design (SUTD) Invited speaker and panelist, Visual Learning and Reasoning for Robotic Manipulation

Kry, Paul
Invited Speaker, Huawei visual computing research group, Physics-based computer animation and its applications for virtual humans, 6/9/2020

Mahajan, Aditya
Approximate Planning and Learning for Partially Observed Systems, Keynote

Approximate Planning and Learning for Partially Observed Systems, Departmental Seminar, University of Michigan, Ann Arbor, USA, Dec 2020

Approximate Planning and Learning for Partially Observed Systems, Departmental Seminar, University of Cambridge, Oxford, UK, Nov 2020

Approximate Planning and Learning for Partially Observed Systems, Mila, Montreal, Feb 2020

Meger, David

Nowrouzezahrai, Derek

Pineau, Joelle
February 7 2020: Keynote for AAAI workshop on Reproducibility.
July 16 2020: Keynote for International Conference on Distributed and Event-based Systems
August 2020: Keynote for Deep Learning Day @ KDD conference.
September 25 2020: Invited talk for MiCHAMP seminar series at University of Michigan.
October 28 2020: Invited talk for TechAid event.


Siddiqi, Kaleem
invited speaker

(ii) contributed presentations

Graph Supervision for Visual Recognition. Poster presentation (online) by Chu Wang at International Conference on Computer Vision and Pattern Recognition (CVPR, Seattle, CA), June 2020.

Role of Wnt/β-Catenin Pathway Mediators in Rat Infarcted Hearts


Forbes, James


Gross, Warren


Hayward, Vincent


Husty, Manfred


Lin, Hsui-Chin

Liu, Xiu
Chun-Tung Li, Jiannong Cao, Xue Liu, Milos Manavalan: mSIMPAD: Efficient and Robust Mining of Successive Similar Patterns of Multiple Applications. Softw. Test. Verification Reliab. 30(4-5) (2020)
Chen Ma, Lihe Ma, Yinxue Zhang, Jiaxing Sun, Xue Liu, Mark Coates: Memory Augmented Graph Neural Networks for Sequential Recommendation. AAAI 2020: 5045-5052
Dongjie Tang, Yun Wang, Linsheng Li, Jiacheng Ma, Xue Liu, Zhengwei Qi, Haibing Guan: gRemote: API Forwarding Powered Cloud Rendering. HPDC 2020: 197-201
Hang Li, Chen Ma, Wei Xu, Xue Liu: Feature Statistics Guided Efficient Filter Pruning. IJCAI 2020: 2619-2625
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Zhongjie Ba, Tianhang Zheng, Xinyu Zhang, Zhan Qin, Baohan Li, Xue Liu, Kui Ren: Learning-based Practical Smartphone Eavesdropping with Built-in Accelerometer. NDSS 2020
Yu-Chen Lin, Tse-Yuan Wang, Che-Wei Tsaio, Yuan-Hao Chang, Jian-Jia Chen, Xue Liu, Tei-Yuan Lee: Overheating-Avoidance Adaptive Experimenting-Simulation Based Real Time Collision Detection. RSS workshop
Landu Jiang, Boja Qi, Xue (Steve) Liu, Chenxi Huang, Kunhui Lin: DeepFood: Food Image Recommendation. AAAI 2020: 5045-5052
Mongrain, Rosaire


Precup, Doina


Philip Amortila, Doina Precup, Prakash Panagadane and Marc G. Bellemare, A Distributional Analysis of Sampling-Based Reinforcement Learning Algorithms. AISTATS 2020 (2020-06-03)

David Abel, Nate Umbenhower, Khimya Khetarpal, Dilip Arumugam, Doina Precup and Michael L. Littman, Value Preserving State-Action Abstractions. AISTATS 2020 (2020-06-03)


Philip Amortila, Doina Precup, Prakash Panagadane and Marc G. Bellemare, A Distributional Analysis of Sampling-Based Reinforcement Learning Algorithms. AISTATS 2020 (2020-06-03)

David Abel, Nate Umbenhower, Khimya Khetarpal, Dilip Arumugam, Doina Precup and Michael L. Littman, Value Preserving State-Action Abstractions. AISTATS 2020 (2020-06-03)


Andrei Lupu and Doina Precup, Gifting in Multi-Agent Reinforcement Learning. AAMAS 2020
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Andrei Lupu and Doina Precup, Gifting in Multi-Agent Reinforcement Learning (Student Abstract) AAAI 2020 (2020-04-03)


Di Wu, Boyu Wang, Doina Precup and Benoit Boulet, Multiple Kernel Learning-Based Transfer Regression for Electric Load Forecasting, IEEE Transactions on Smart Grid (2020-03-01)


Veronica Chelu, Doina Precup and Hado P. van Hasselt, Forethought and Hindsight in Credit Assignment. NEURIPS 2020 (2020-01-01)

Martin Klissarov and Doina Precup, Reward Propagation Using Graph Convolutional Networks. NEURIPS 2020 (2020-01-01)


Sedal, Audrey
A Sedal, A Wineman, “Force reversal and energy dissipation in composite tubes through nonlinear viscoelasticity of component materials”. Proceedings of the Royal Society A 476 (2241), 20200299, 2020


Sedal, Audrey
Associate Invited Talks

**Armanfard, Narges**
*Leveraging RGBD data for human activity recognition*, SanctuaryAI, Canada.

*Improved Deep Embedding Clustering with Deep Fuzzy Supervision*, Ericsson, Canada.

*Artificial Intelligence for Mechanical Properties Prediction*, Algoma Steel, Canada.

*Artificial intelligence for improving vehicle maintenance*, Trimac Transportation, Canada.

**Cheung, Jackie**
*Overcoming Dataset Biases in Automatic Summarization*, Microsoft Research, Montreal, October 20, 2020, Held virtually, Invited

*Exploiting and Overcoming Dataset Biases in Natural Language Processing*, University of Alberta, Edmonton, Alberta, July 27, 2020, Held virtually, Invited


**Dimitrakopoulos, Roussos**


**Forbes, James**


*Wind-Velocity Estimation for Enhanced UAV Path Planning and Control,* Ingenyitu Labs Research Institute Lecture Series, Queen’s University, February 12, 2020.

**Gross, Warren**


**Lin, Hsui-Chin**
*Computer Science Colloquium Series, McGill University. September 2020.*

*Mobile Robotics group, McGill University. February 2020.*

**Liu, Xiu**
VIP RoundTable, “The Future of Mobility”, Host and speaker, Samsung Research America, Mountain View, CA, August 14, 2020.


**Mongrain, Rosaire**


**Moon, A Jung**


*Let it be resolved that… Robots designed for personal or household use have failed because of fundamental misunderstandings of Human-Robot Interaction (HRI), ICRA 2020 Debates on the Future of Robotics Research Workshop, Virtual. June 2020.*

**Panangaden, Prakash**
UC Riverside Applied Category Theory Seminar. April 2020

Perimeter Institute Workshop on Categorical Probability and Statistics. June 2020


**Precup, Doina**
## Associate Funding

<table>
<thead>
<tr>
<th></th>
<th>Total CIM Associate</th>
<th>Total 2020</th>
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<tbody>
<tr>
<td>MITACS</td>
<td>$301,667</td>
<td>$234,167</td>
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<td>NSERC</td>
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<tr>
<td>FRQNT</td>
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<td>Industry/Other</td>
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<td><strong>Total</strong></td>
<td><strong>$17,706,977</strong></td>
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