Curriculum Vitae
Liam Paull

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Personal:	liampaull.ca
Group:	montrealrobotics.ca
Languages:	English and French

Education

2008 - 2013	Ph.D., Electrical and Computer Engineering University of New Brunswick Advisor: Dr. Mae Seto and Dr. Howard Li Thesis Title: "Robust Online Adaptive Sensor-Driven Survey Planning for Single and Multiple Autonomous Vehicles"
2007 - 2008	M.Sc., Electrical and Computer Engineering (Not Completed) University of New Brunswick Note: Fast-tracked to Ph.D. Results were published in [J15].
2001 - 2004	B.Sc., Computer Engineering McGill University

Research Experience

2017 - present	Assistant Professor - Université de Montréal
2017 - present	Faculty Fellow - Element AI
2017 - present	Director - Duckietown Foundation
2015 - 2017	Research Scientist - MIT (MIT/CSAIL Driverless car project technical lead)
2013 - 2015	Postdoctoral Associate - MIT (Marine robotics group)
2010 - 2012	Research Assistant - Defense R&D Canada

Teaching Experience

Winter 2018-19	Université de Montréal IFT2245 Systèmes d'exploitation (Operating Systems) - Lecturer
Fall 2017-19	Université de Montréal IFT6757 Autonomous Vehicles (a.k.a. "Duckietown") - Developer and lecturer
Spring 2016	MIT 2.166 Aunonomous Vehicles (a.k.a. "Duckietown") - Developer and lecturer
Spring 2014-15	MIT 2.680 Marine Vehicle Autonomy - Teaching assistant

Advisory Experience

Leadership:

2017-present	Founding member of the Montreal Robotics and Embodied AI Lab (REAL)
2017-present	Founding member of the Duckietown Project (C7,J2,C10,W5)
2015-17	Lead of a team of postdoctoral associates, graduate students, and engineers for the Toyota Research Intitute funded CSAIL autonomous car project (J6,C4,C5,C6,C8,C9)
2013-14	Co-led the MIT RobotX team that won 1st place at the inaugural RobotX competition in Singapore in Oct. 2014 (C17).
2011	Student lead of the COBRA Unmanned Systems Canada ground vehicle competition team (1st place)

Mentor / Advising Graduate Students and Postdocs:

(degree, location, advising status) indicated for each person followed by project title if available

2020 - present	Anthony Courchesne (MSc, Montreal, advisor) - Reproducibility in robotics with Duckietown and the AI Driving Olympics
2019 - present	Florian Golemo (Postdoc, Montreal, co-advisor with Aaron Courville)
2019 - present	Zhen Liu (PhD, Montreal, co-advisor with Yoshua Bengio)
2019 - present	Philippe Laferiere (MSc, Montreal, advisor)
2019 - present	Rey Reza Wiyatno (MSc, Montreal, advisor)
2019 - present	Dhaivat Bhatt (MSc, Montreal, advisor) - Probabilistic Object Detection
2019 - present	Bhairav Mehta (MSc, Montreal, co-advisor with Chris Pal) - Generalization and sim2real transfer [C2]
2018 - present	J. Krishna Murthy (PhD, Montreal, advisor) - Deep semantic SLAM C**??**
2018 - present	Vincent Mai (PhD, Montreal, advisor) - Previous work published in J4.
2018 - present	Ruixiang Zhang (PhD, Montreal, co-advisor with Yoshua Bengio) - Perceptual generative autoencoders [C32]
2018 - present	Gunshi Gupta (MSc, Montreal, advisor) - Stein methods for uncertainty estimation in object detection
2018 - present	Manfred Diaz (PhD, Montreal, advisor) - Inference over intentions for autonomous driving
2017 - present	Sai Krishna Gottipati (MSc, Montreal, advisor) - Learning map representations for active SLAM [C3]
2017 - present	Nithin Visisth (MSc, Montreal, advisor) - Task Decomposition using Skills
2017 - present	Breandan Considine (MSc, Montreal, co-advisor with Michalis Famelis) - Programming tools for intelligent systems with a case study in autonomous robotics [C4, C1]
2016 - present	Teddy Ort (PhD, MIT, mentor) - Autonomous vehicle localization based on laser intensity (C5)
2017-18	Manfred Diaz (MSc, Concordia, co-advisor with Thomas Fevens) - Interactive and Uncertainty-aware Imitation Learning: Theory and Applications
2017	Veronica Lane (MEng MIT, mentor) - Obstacle Detection and Tracking in an Urban Environment Using 3D LiDAR and a Mobileye 560
2017	Bethany LaPenta (MEng MIT, advisor) - The Ducklingbot – a Self-Driving Robot on a Pi Zero
2014-16	Beipeng Mu (MEng MIT, mentor) - Task-driven Navigation and Mapping with Resource Constraints (J7, C11, C12, C16)
2013-15	Ross Finman (Ph.D. MIT, mentor) - 3D object-based mapping (W8, W9)
2013-15	Janille Maragh (MSc MIT, mentor) - Cooperative localization of AUVs

Mentor / Advisor Undergraduate Projects:

2019 - present	Amrut Sarangi (intern, Montreal, advisor) - Intention prediction for autonomous driving
2019 - present	Rohan Raj (intern, Montreal, advisor)
2019 - present	Mark Van der Merwe (intern, Montreal, advisor) - Dense semantic completion
2019 - present	Dishank Bansal (intern, Montreal, advisor) - Probabilistic object detection
2019 - present	Sharath Chandra (intern, Montreal, advisor) - Residual self-play for RL
2018 - 2019	Dhaivat Bhatt (intern, Montreal, advisor) - Probabilistic object detection
2018	Zihan Wang (intern, Montreal, co-advisor with Yoshua Bengio) - Domain adversarial transfer [C3]
2018	Bhairav Mehta (intern, Montreal, co-advisor with Chris Pal) - Active domain randomization [C2]
2018	Sarthak Sharma (intern, Montreal, advisor) - Deep visual odometry
2018	Homanga Bharadhwaj (intern, Montreal, co-advisor with Yoshua Bengio) - Domain adversarial transfer [C3]
2018	Adam Sigal (intern, Montreal, advisor) - IVADO Undergraduate Research Scholarship
2018	Abdelhakim Qbaich (intern, Montreal, advisor) - NSERC Undergraduate Student Research Award (USRA)
2016 - 17	Alexander Amini (Undergrad, MIT, mentor) - Distributed end-to-end deep learning for autonomous driving [C4]
2016 - 17	Tom Yan (Undergrad, MIT, advisor) - Road segmentation with deep learning
2016	Chandon Subedi (Undergrad, MIT, advisor) - Autonomous Duckiebot detection
2014 - 15	Ernesto Ramirez (Undergrad, MIT, advisor) - Multi-robot mapping with turtlebots
2012	Denise Sweet (Undergrad, UNB, mentor) - Fusing RGB and thermal imagery
2011	Scott Mallais (Undergrad, UNB, mentor) - Underwater acoustic communications
2010	Yao Kok and Shang Yang (Undegrad, UNB, mentor) - Hexagon cell decomposition for convex polygons
2009	Derek McKay (Undergrad, UNB, mentor) - Domestic electric water heater modeling

Accepted Grant Applications

1. Canadian CIFAR AI Chair. 2019-2024. Total value $1 050 000.
2. "Uncertainty estimation of perceptual tasks for autonomous vehicles." Denso research collaboration. Principal Investigator. 2019-2020. Total Value $161 000.
3. NSERC Discovery Launch Supplement (DGECR). 2018-19. Total value $12 500.
4. "Teaching Robots How to Build Maps with Deep Reinforcement Learning." *Fonds de recherche nature et technologies Quebec (FQNRT) – Établissement de nouveaux chercheurs et de nouvelles chercheuses universitaires.* 2018-2020. Total value $50 800.
5. "Learning Representations for Autonomous Mobile Robotics to Enable Complex Tasks." *NSERC Discovery Grant.* Principal investigator. 2018-2023. Total value $140 000.
6. "Autonomous Mobile Robotics" *Canadian Foundation for Innovation.* Principal investigator. 2018-2023. Total value $372 230.
7. "Next Generation Deep Learning: from pattern recognition to AI - Lifelong SLAM for Indoor and Autonomous Vehicle Navigation" *Samsung Advanced Institute of Technology.* Co-Principal investigator with Yoshua Bengio (lead PI), Aaron Courville, Pascal Vincent, Christopher Pal, Simon Lacoste-Julien, and Laurent Charlin. 2018- 2021. Total value for entire project $1 650 000. $300 000 allocated to Liam Paull.

8. "Resource Constrained Cooperative Underwater Localization and Mapping." *Office of Naval Research*. 2016. Co-written with Prof. John J. Leonard.

Publications

Graduate Thesis

[T1] "Robust Online Adaptive Sensor-Driven Survey Planning for Single and Multiple Autonomous Underwater Vehicles." University of New Brunswick. November 2013.

Book Chapters

[B1] **Liam Paull**, Mae Seto, Sajad Saeedi, John Leonard. "Navigation for Underwater Vehicles" in Encyclopedia of Robotics. Springer 2018. In production.

[B2] **Liam Paull**, Sajad Saeedi, Howard Li. "Path Planning for Autonomous Underwater Vehicles." in *Autonomy for Marine Robots*. Springer 2012. Editor: Dr. Mae Seto. p177-224.

[B3] Mae Seto, **Liam Paull**, Sajad Saeedi. "Introduction to Autonomy for Marine Robots." in *Autonomy for Marine Robots*. Springer 2012. Editor:: Dr. Mae Seto.

Journal Articles

[J1] Teddy Ort, Krishna Murthy, Rohan Banerjee, Sai Krishna Gottipati, Dhaivat Bhatt, Igor Gilitschenski, **Liam Paull**, Daniela Rus. "Maplite: Autonomous Intersection Navigation without a Detailed Prior Map." *IEEE Robotics and Automation Letters*. 2020. In press

[J2] Julian Zilly, Jacopo Tani, Breandan Considine, Bhairav Mehta, Andrea F Daniele, Manfred Diaz, Gianmarco Bernasconi, Claudio Ruch, Jan Hakenberg, Florian Golemo, A Kirsten Bowser, Matthew R Walter, Ruslan Hristov, Sunil Mallya, Emilio Frazzoli, Andrea Censi, **Liam Paull**. "The AI Driving Olympics at NeurIPS 2018" *Springer NeurIPS 2018 competition proceedings*. 2020.

[J3] Sai Krishna, Keehong Seo, Dhaivat Bhatt, Vincent Mai, Krishna Murthy, **Liam Paull**. "Deep Active Localization". *Robotics and Autonomation - Letters*. 2019.

[J4] Vincent Mai, Mina Kamel, Matthias Krebs, Andreas Schaffner, Daniel Meier, **Liam Paull**, Roland Siegwart. "Local Positioning System Using UWB Range Measurements for an Unmanned Blimp." *Robotics and Automation - Letters*. 2018.

[J5] **Liam Paull**, Mae Seto, John J. Leonard, Howard Li. "Probabilistic Cooperative Mobile Robot Area Coverage and its Application to Autonomous Seabed Mapping." *International Journal of Robotics Research*. 37(1). p. 21-45. 2018.

[J6] Wilko Schwarting, Javier Alonso-Mora, **Liam Paull**, Sertac Karaman, Daniela Rus. "Safe Nonlinear Trajectory Generation for Parallel Autonomy with a Dynamic Vehicle Model." *IEEE Transactions on Intelligent Transportation Systems*. 2018.

[J7] Beipeng Mu, **Liam Paull**, Aliakbar Agha-Mohammadi, John J. Leonard, Jonathan P. How. "Two-Stage Focused Inference for Resource-Constrained Collision-Averse Navigation." *IEEE Transactions on Robotics*. 33(1). p. 124-140. 2017.

[J8] **Liam Paull**, Carl Thibault, Amr Nagaty, Howard Li. "Sensor-Driven Area Coverage for an Autonomous Fixed-Wing Unmanned Aerial Vehicle." *IEEE Transactions on Cybernetics*. 44(9). p. 1605-1618. 2014.

[J9] **Liam Paull**, Sajad Saeedi, Mae Seto, Howard Li. "AUV Navigation and Localization - A Review." *IEEE Journal of Oceanic Engineering*. 39(1). p. 131-149. 2014.

[J10] Sajad Saeedi, **Liam Paull**, Michael Trentini, and Howard Li. "Group Mapping: A Topological Approach to Map Merging for Multiple Robots." *IEEE Robotics and Automation Magazine*. 21(2). p. 60-72. 2014.

[J11] Sajad Saeedi, **Liam Paull**, Michael Trentini, Mae Seto and Howard Li. "Map Merging for Multiple Robots Using Hough Peak Matching." *Robots and Autonomous Systems*. 62(10). p. 1408-1424. 2014.

[J12] Sajad Saeedi, **Liam Paull**, Michael Trentini, and Howard Li. "Map Merging for Multiple Robot Simultaneous Localization and Mapping." *International Journal of Robotics and Automation*. 30(2). 149-157. 2014.

[J13] **Liam Paull**, Sajad Saeedi, Mae Seto, Howard Li. "Sensor-Driven Online Coverage Planning for Autonomous Underwater Vehicles." *IEEE/ASME Transactions on Mechatronics*. 18(6). p. 1827-1838. 2013.

[J14] Sajad Saeedi, **Liam Paull**, Mike Trentini, Howard Li. "Neural Network-based Multiple Robot Simultaneous Localization and Mapping". *IEEE Transactions on Neural Networks*. 22(12), p. 2376-2387. 2012.

[J15] **Liam Paull**, Howard Li, Liuchen Chang. "A Novel Domestic Electric Water Heater Model for a Multi-Objective Demand Side Management Program." *Electric Power Systems Research*. 80(12), p. 1446-1451. 2010.

[J16] Howard Li, **Liam Paull**, Yevgen Biletskiy, Simon Yang. "Document Classification Using Information Theory and a fast Back-Propagation Neural Network." *Intelligent Automation and Soft Computing*. 16(1), p. 25-38. 2010.

Refereed Conference Publications

[C1] Krishna Murthy Jatavallabhula, Ginesh Iyer, **Liam Paull**. "∇SLAM: Dense SLAM meets Automatic Differentiation." *IEEE International Conference on Robotics and Automation (ICRA)*. 2020. Accepted.

[C2] Bhairav Mehta, Manfred Diaz, Florian Golemo, Christopher J Pal, **Liam Paull**. "Active Domain Randomization". *Conference on Robot Learning*. 2019. link.

[C3] Homanga Bharadhwaj, Zihan Wang, Yoshua Bengio, **Liam Paull**. "A Data-Efficient Framework for Training and Sim-to-Real Transfer of Navigation Policies." *IEEE International Conference on Robotics and Automation (ICRA)*. 2019.

[C4] Alexander Amini, **Liam Paull**, Thomas Balch, Sertac Karaman, Daniela Rus. "Learning Steering Bounds for Parallel Autonomous Systems" *IEEE International Conference on Robotics and Automation (ICRA)*. 2018.

[C5] Teddy Ort, **Liam Paull**, Daniela Rus. "Autonomous Vehicle Navigation in Rural Environments without Detailed Prior Maps." *IEEE International Conference on Robotics and Automation (ICRA)*. 2018.

[C6] Guy Rosman, **Liam Paull**, Daniela Rus. "Hybrid Control and Learning with Coresets for Autonomous Vehicles" *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2017.

[C7] **Liam Paull**, Jacopo Tani, Heejin Ahn, Javier Alonso-Mora, Luca Carlone, Michal Cap, Yu Fan Chen, Changhyun Choi, Jeff Dusek, Daniel Hoehener, Shih-Yuan Liu, Michael Novitzky, Igor Franzoni Okuyama, Jason Pazis, Guy Rosman, Valerio Varricchio, Hsueh-Cheng Wang, Dmitry Yershov, Hang Zhao, Michael Benjamin, Christopher Carr, Maria Zuber, Sertac Karaman, Emilio Frazzoli, Domitilla Del Vecchio, Daniela Rus, Jonathan How, John Leonard, Andrea Censi. "Duckietown: an Open, Inexpensive and Flexible Platform for Autonomy Education and Research" *IEEE Conference on Robotics and Automation.* 2017.

[C8] Wilko Schwarting, Javier Alonso-Mora, **Liam Paull**, Sertac Karaman, Daniela Rus "Parallel Autonomy in Automated Vehicles: Trajectory Generation with Real-time Obstacle Avoidance and Human Input Optimization" *IEEE Conference on Robotics and Automation.* 2017.

[C9] Felix Naser, David Dorhout, Stephen Proulx, Scott Drew Pendleton, Hans Andersen, Wilko Schwarting, **Liam Paull**, Javier Alonso-Mora, Marcelo H. Ang Jr., Sertac Karaman, Russ Tedrake, John Leonard, Daniela Rus. "A Parallel Autonomy Research Platform." *IEEE Intelligent Vehicles Symposium.* 2017.

[C10] Jacopo Tani, **Liam Paull**, Andrea Censi, Maria Zuber, Daniela Rus, Jonathan How and John Leonard. "Duckietown: an Innovative Way to Teach Autonomy." *EduRobotics Conference.* 2016.

[C11] Beipeng Mu, Matthew Giamou, **Liam Paull**, Ali-akbar Agha-mohammadi, John J. Leonard, Jonathan P. How. "Information-based Active SLAM via Topological Feature Graphs." *IEEE Conference on Decision and Control.* 2016.

[C12] Beipeng Mu, Shih-Yuan Liu, **Liam Paull**, John Leonard, Jonathan How. "SLAM with Objects using a Nonparametric Pose Graph." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* 2016.

[C13] Kevin Eckenhoff, **Liam Paull**, Guoquan Huang. "Decoupled, Consistent Node Removal and Edge Sparsification for Graph-based SLAM." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* 2016.

[C14] **Liam Paull**, Guoquan Huang, John Leonard. "A Unified Resource-Constrained Framework for Graph SLAM." *IEEE International Conference on Robotics and Automation (ICRA).* 2016.

[C15] Hsueh-Cheng Wang, Chelsea Finn, **Liam Paull**, Michael Kaess, Ruth Rosenholtz, Seth Teller, and John Leonard. "Bridging Text Spotting and SLAM with Junction Features." *IEEE/RSJ International Confer- ence on Intelligent Robots and Systems (IROS).* 2015.

[C16] Beipeng Mu, Ali Agha, **Liam Paull**, Matt Graham, Jonathan How, John J Leonard. "Two-Stage Focused Inference for Resource-Constrained Collision-Free Navigation." *Robotics: Science and Systems (RSS).* 2015.

[C17] Arthur Anderson, Erin Fischell, Thom Howe, Tom Miller, Arturo Parrales-Salinas, Nick Rypkema, David Barrett, Michael Benjamin, Alex Brennen, Michael Defillipo, John Leonard, **Liam Paull**, Henrik Schmidt, Nick Wang, and Alon Yaari. "An Overview of MIT-Olin's Approach in the AUVSI RobotX Competition." *Field and Service Robotics (FSR).* 2015.

[C18] **Liam Paull**, Guoquan Huang, Mae Seto, John Leonard. "Communication-Constrained Multi-AUV Cooperative SLAM." *IEEE International Conference on Robotics and Automation (ICRA).* 2015.

[C19] **Liam Paull**, Mae Seto, John Leonard. "Decentralized Cooperative Trajectory Estimation for Autonomous Underwater Vehicles." *IEEE/RSJ International Conference on Intelligent Robots*

and Systems (IROS). 2014.

[C20] **Liam Paull**, Mae Seto, Howard Li. "Area Coverage Planning that Accounts for Pose Uncertainty with an AUV Seabed Surveying Application." *IEEE International Conference on Robotics and Automation (ICRA).* 2014.

[C21] **Liam Paull**, Sajad Saeedi, Mae Seto, Howard Li. "Sensor Driven Online Coverage Planning for Autonomous Underwater Vehicles." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* 2012.

[C22] **Liam Paull**, Gaetan Severac, Guilherme V. Raffo, Julian M. Angel, Harold Boley, Maki K. Habib, Bao Nguyen, Veera R. S. Kumar, Sajad Saeedi G., Ricardo Sanz, Mae Seto, Aleksandar Stefanovski, Michael Trentini, Howard Li. "Towards An Ontology for Autonomous Robots." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* 2012.

[C23] Sajad Saeedi Gharahbolagh, **Liam Paull**, Michael Trentini, Mae Seto, Howard Li. " Map Merging Using Hough Peak Matching." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* 2012.

[C24] Sajad Saeedi Gharahbolagh, **Liam Paull**, Michael Trentini, Mae Seto, Howard Li. "Efficient Map Merging Using a Probabilistic Generalized Voronoi Diagram." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* 2012.

[C25] Sajad Saeedi Gharahbolagh, **Liam Paull**, Michael Trentini, Howard Li. "Neural Network-based Multiple Robot Simultaneous Localization and Mapping." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* p.880-885. 2011.

[C26] Sajad Saeedi Gharahbolagh, **Liam Paull**, Michael Trentini, Howard Li. "Multiple Robot Simultaneous Localization and Mapping." *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).* p. 853-888. 2011.

[C27] **Liam Paull**, Sajad Saeedi G., Mae Seto, Howard Li. "A Multi-Agent Framework with MOOS-IvP for Autonomous Underwater Vehicles with Sidescan Sonar Sensors." *International Conference on Autonomous and Intelligent Systems.* p. 41-50. 2011.

[C28] **Liam Paull**, Sajad Saeedi, Howard Li, Vincent Myers. "An Information Gain Based Adaptive Path Planning Method for an Autonomous Underwater Vehicle Using Sidescan Sonar." *IEEE Conference on Automation Science and Engineering (CASE).* p. 835-840. 2010.

[C29] Arnaldo Sepulveda, **Liam Paull**, Walid G. Morsi, Howard Li, Chris P. Diduch, Liuchen Chang. "A Novel Demand Side Management Program Using Water Heaters and Particle Swarm Optimization." *Electric Power and Energy Conference (EPEC).* 2010.

[C30] **Liam Paull**, Derek MacKay, Howard Li, Liuchen Chang. "A Water Heater Model for Increased Power System Efficiency." *Canadian Conference on Electrical and Computer Engineering (CCECE).* p. 731-734. 2009.

[C31] **Liam Paull**, Howard Li, Liuchen Chang. "The development of a fuzzy neural system for load forecasting." *Canadian Conference on Electrical and Computer Engineering (CCECE).* p. 923-926. 2008.

Refereed or Abstract Refereed Workshop Publications

[W1] Breandan M Considine, **Liam Paull**, Michalis Famelis. "Kotlin∇: A Shape Safe eDSL for Differentiable Functional Programming." *NeurIPS 2019 workshop on Program Transformations.* 2019.

[W2] Zijun Zhang, Ruixiang Zhang, Zongpeng Li, Yoshua Bengio, **Liam Paull**. "Perceptual Generative Autoencoders." *ICLR Workshop on Deep Generative Models for Highly Structured Data.* 2019. Open Review.

[W3] Bhairav Mehta, Manfred Diaz, Florian Golemo, Chistopher Pal, **Liam Paull**. "Active Domain Randomization" *The 4th Multidisciplinary Conference on Reinforcement Learning and Decision Making.* 2019.

[W4] Breandan Considine, Ruslan Hristov, **Liam Paull**. "Duckietown: Software Infrastructure for Autonomous Robotics." *IROS 2018 Workshop: Automating Robot Experiments.* 2018.

[W5] Andrea Censi, **Liam Paull**, Jacopo Tani, Thomas Ackermann, Oscar Beijbom, Berabi Berkai, Gianmarco Bernasconi, Anne Kirsten Bowser, Simon Bing, Pin-Wei David Chen, Yu-Chen Chen, Maxime Chevalier- Boisvert, Breandan Considine, Justin De Castri, Maurilio Di Cicco, Manfred Diaz, Paul Aurel Diederichs, Florian Golemo, Ruslan Hristov, Lily Hsu, Yi-Wei Daniel Huang, Chen-Hao Peter Hung, Qing-Shan Jia, Julien Kindle, Dzenan Lapandic, Cheng-Lung Lu, Sunil Mallya, Bhairav Mehta, Aurel Neff, Eryk Nice, Yang-Hung Allen Ou, Abdelhakim Qbaich, Josefine Quack, Claudio Ruch, Adam Sigal, Niklas Stolz, Ale- jandro Unghia, Ben Weber, Sean Wilson, Zi-Xiang Xia, Timothius Victorio Yasin, Nivethan Yogarajah, Julian Zilly, Yoshua Bengio, Tao Zhang, Hsueh-Cheng Wang, Stefano Soatto, Magnus Egerstedt, Emilio Frazzoli. "The AI Driving Olympics at NIPS 2018" *Robotics: Science and Systems Workshop on New Benchmarks, Metrics, and Competitions for Robotic Learning* 1-9. 2018.

[W6] Ganesh Iyer, J. Krishna Murthy, Gunshi Gupta, K. Madhava Krishna, **Liam Paull**. "Geometric Consistency for Self-Supervised End-to-End Visual Odometry" *Computer Vision and Pattern Recognition 1st International Workshop on Deep Learning for Visual SLAM.* 1-8. 2018.

[W7] **Liam Paull**, Mae Seto, John Leonard. "Cooperative Area Coverage." *RSS Workshop on Principles of Multi-Robot Systems.* 2015

[W8] Ross Finman, **Liam Paull**, John Leonard. "Toward Object-based Place Recognition in Dense RGB-D Maps." *IEEE International Conference on Robotics and Automation (ICRA) Workshop on Place Recognition in Changing Environments.* 2015.

[W9] Ross Finman, Thomas Whelan, **Liam Paull**, John Leonard. "Physical Words for Place Recognition in RGB-D Maps." *International Conference on Robotics and Automation Workshop on Place Recognition in Changing Environments.* 2014.

Manuscripts Preprints

[C32] Zijun Zhang, Ruixiang Zhang, Zongpeng Li, Yoshua Bengio, **Liam Paull**. "Perceptual Generative Autoencoders". ArXiv.

[C33] Bhairav Mehta and Tristan Deleu and Sharath Chandra Raparthy and Chris J. Pal and **Liam Paull**. "Curriculum in Gradient-Based Meta-Reinforcement Learnin". ArXiv.

[C34] Sharath Chandra Raparthy, Bhairav Mehta, Florian Golemo, **Liam Paull**. "Generating Automatic Curricula via Self-Supervised Active Domain Randomization". ArXiv.

Academic Services

Conference / Workshops Organized

- The AI Driving Olympics live competition at the Neural Information Processing Systems (NeurIPS) 2019
- The AI Driving Olympics live competition at the International Conference on Robotics and Automation (ICRA) 2019
- The AI Driving Olympics live competition at the Neural Information Processing Systems (NeurIPS) 2018
- RSS 2016 Workshop organizer: Geometry and Beyond - Representations, Physics, and Scene Understanding for Robotics
- ICRA 2016 Workshop organizer: Marine Robot Navigation and Localization
- Northeastern Robotics Colloquium 2015 co-organizer
- MOOS-DAWG 2015 co-organizer

Grant Review Services

- IVADO grant selection committee 2017
- NSERC Mitacs Accelerate Reviewer 2017-19
- NSF ocean technology and interdisciplinary coordination program reviewer 2016

Conference Program / Editorial Committees

- Program Chair: Conference on Computer and Robot Vision (CRV) 2020
- Area Chair: Conference on Robot Learning (CoRL) 2019
- Associate Editor: IROS 2017-19
- Associate Editor: Robotics and Automation Letters 2017-19
- Associate Editor: ICRA 2016
- Program Committee: Robotics: Science and Systems (RSS) 2015-18
- Program Committee: CVPR Workshop on Autonomous Driving (WAD2018)
- Program Committee: Computer and Robot Vision (CRV) 2018-19

Selected Journals and Conferences Reviewed

- IEEE Transactions on {Robotics, Neural Networks and Learning Systems, Controls Systems Technology, Cybernetics, Aerospace and Electronic Systems}
- International Journal of Robotics Research
- Journal of Field Robotics
- IEEE Control Systems Magazine
- Journal of Guidance, Control, and Dynamics
- IEEE Journal of Oceanic Engineering
- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- Robotics: Science and Systems (RSS)

Graduate Thesis Committees

- Asma Ben Khedher "Analyse visuelle et cérébrale de l'état cognitif d'un apprenant" Examining Committee 2019.
- Guillaume Alain "Auto-Encoders, Distributed Training and Information Representation in Deep Neural Network" Examining Committee 2019.
- Navpreet Kaur "Modelling and Reasoning with Software Product Lines with Design Choices" Examining Committee 2019.
- Arnaud Shoentgen "Tools for Liquid Control in Computer Graphics" Predoc Exam 2018
- Kyle Kastner "Sequential Decision Modeling In Uncertain Conditions" Predoc Exam 2018
- Andre Phu-van Nguyen "Méthodes d'inspection automatique d'infrastructure par robot mobile" 2017.
- Beipeng Mu "Task-driven Navigation and Mapping with Resource Constraints" 2016.
- Matthew Graham "Robust Bayesian state estimation and mapping" 2015.
- Theodore Steiner "Utility-based map reduction for ground and flight vehicle navigation" 2015.

Other Committees and Activities

- Presenter at the Séjour informatique 2018, 2019
- DIRO Recruitement Committee 2017-present
- MIT EECS Graduate Admissions Committee 2017

Outreach

4/2019	Hudson CodeClub
2/2019	Robotics Week - Our Lady of Peace elementary
1/2018	Let's Talk Science - Canada2067

Recent Invited Talks and Panels

05/2019	Computer and Robot Vision Conference Keynote
04/2019	Sommet Immobilier de Montreal panel on AI
04/2019	Rendez-vous IA Québec Keynote
10/2018	DIRO Alumni talk
6/2018	Element AI, Toronto
5/2018	Honneywell Symposium Keynote Address, Atlanta
4/2018	Fourth IEEE Research Boost, Montreal
4/2018	Google Brain, Montreal
1/2018	Université de Laval, Quebec City
12/2017	McGill University SOCS Colloquium
4/2017	University of Massachusetts Boston MassIntelligence Conference
4/2017	University of Toronto Department of Computer Science
4/2017	Massachusetts Institute of Technology Mechanical Engineering Special Seminar
2/2017	MIT Technology Conference Moderator
1/2017	Stanford University Workshop on Human-Centric AI for Intelligent Machines

Media Coverage

- Learn to Program Self-Driving Cars (and Help Duckies Commute) With Duckietown - IEEE Spectrum (Aug 20, 2018)
- La Fondation canadienne pour l'innovation annonce un nouvel appui pour la recherche à l'UdeM - U de M nouvelles (April 11, 2018)
- Une ville de canards pour tester les véhicules - La Presse + (April, 8, 2018)
- En voiture, les canards! - U de M nouvelles (April 4, 2018)
- Why MITs Duckietown uses adorable rubber toys to research self-driving cars - Boston.com (June 2, 2016)
- A tiny town of rubber ducks is laying the groundwork for the next generation of self-driving cars - Quartz (April 29, 2016)
- Meet the self-driving rubber duckie taxis of Duckietown - Popular Science (April 20, 2016)
- Self-driving cars, meet rubber duckies - CSAIL News (April 20, 2016)

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