

Curriculum Vitae

LIAM PAULL

Office Address: Université de Montréal
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Languages: English and French

Education

2008 - 2013 Ph.D., Electrical and Computer Engineering
University of New Brunswick
Advisors: 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
Advisor: Dr. Liuchen Chang
Note: Fast-tracked to Ph.D.

2001 - 2004 B.Sc., Computer Engineering
McGill University

Professional Appointments

2023 - present Associate Professor - Université de Montréal

2023 - present Member of the [Courtois Institute](#)

2021 - present Core Academic Member of the Quebec Artificial Intelligence Institute ([Mila](#))

2017 - present Director and President (since 2019) - [Duckietown Foundation](#)

2020 - present Chief Science and Education Officer - Duckietown Engineering

2017 - 2023 Assistant Professor - Université de Montréal

2017 - 2021 Associate Academic Member of the Quebec Artificial Intelligence Institute ([Mila](#))

2017 - 2021 Faculty Fellow - Element AI

2015 - 2017 Research Scientist - MIT (MIT/CSAIL Driverless car project technical lead)

2013 - 2015 Postdoctoral Associate - MIT (Marine robotics group)

Teaching Experience

2018-23 Université de Montréal IFT2245 Systèmes d'exploitation (Operating Systems) - Lecturer

2017-22 Université de Montréal IFT6757 Autonomous Vehicles (a.k.a. "Duckietown") - Developer and lecturer

Advisory Experience

Leadership:

- 2017-present Founding member of the Montreal Robotics and Embodied AI Lab ([REAL](#))
- 2017-present Founding member of the [Duckietown Project](#)

Mentor / Advising Graduate Students and Postdocs:

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

- 2025 - present Kumaraditya Gupta (PhD, Montreal, advisor) - TBD
- 2025 - present Azalee Robitaille (MSc, Montreal, advisor) - Semantic uncertainty for LLM-based robot planners
- 2024 - present Rodrigue de Schaetzen (PhD, Montreal, advisor) - Uncertainty quantification for end-to-end autonomous driving
- 2024 - present Adam Burhan (MSc, Montreal, advisor) - OOD detection and robot perception
- 2023 - present Samer Nashed (Postdoc, Montreal, advisor)
- 2023 - 2024 Andrea Daniele (Postdoc (part-time), Montreal, advisor) - Duckietown and the AI Driving Olympics
- 2023 - present Luke Rowe (PhD, Montreal, co-advisor with Chris Pal) - Multi-agent trajectory prediction for autonomous driving [C7][C5]
- 2023 - present Sacha Morin (PhD, Montreal, co-advisor with Guy Wolf) - Agentic scene policies [C11][C18] [C9] [C3]
- 2023 - present Charlie Gauthier (PhD, Montreal, advisor) - Generative simulation [C1]
- 2023 - present Miguel Saavedra-Ruiz (PhD, Montreal, advisor) - Lifelong SLAM [J2][C4]
- 2023 - present Ria Arora (MSc, Montreal, co-advisor with Guy Wolf) - Applications of the harmonic filter [W3][J2]
- 2022 - 2025 Mahtab Sandhu (MSc, Montreal, advisor) - Continual object detection
- 2022 - 2023 Steven Parkison (Postdoc, Montreal, advisor) - Harmonic filter [W3][J2]
- 2022 - present Kaustubh Mani (PhD, Montreal, advisor) - Risk-aware exploration in RL [C6][C2]
- 2021 - 2024 Alihusein Kuwajerwala (MSc, Montreal, advisor) Learning vision-language representations for robotics [C12] [C9]
- 2021 - 2023 Miguel Saavedra-Ruiz (MSc, Montreal, advisor) Self-supervised learning for visual navigations [C11][C18][J2]
- 2020 - 2022 Charlie Gauthier (MSc, Montreal, advisor) - Fearful goal generation for robust policy learning [W5]
- 2020 - present Mostafa Elaraby (PhD, Montreal, advisor) - Detecting distributional shift and its application to online interactive imitation learning [W6][C8][J1]
- 2020 - 2023 Dishank Bansal (MSc, Montreal, advisor) - Uncertainty-aware object SLAM
- 2021 - 2022 Ali Harakeh (Postdoc, Montreal, advisor) - Uncertainty quantification for learning-based robotics [C16] [C13]
- 2020 - 2021 Anthony Courchesne (MSc, Montreal, advisor) - A framework for evaluating the usefulness of proxy environments [C23]
- 2019 - 2022 Florian Golemo (Postdoc, Montreal, co-advisor with Chris Pal) [W4]
- 2019 - 2024 Zhen Liu (PhD, Montreal, co-advisor with Yoshua Bengio) [C22][C24][C17][C14]
- 2019 - 2021 Rey Reza Wiyatno (MSc, Montreal, advisor) - Topological navigation [J6]

2019 - 2021	Dhaivat Bhatt (MSc, Montreal, advisor) - Probabilistic object detection [W11][C19]
2018 - 2023	Vincent Mai (PhD, Montreal, advisor) - Uncertainty estimation for efficient reinforcement learning [C20][W10][C5]
2018 - 2023	Ruixiang Zhang (PhD, Montreal, co-advisor with Yoshua Bengio) - Learning controllable and generalizable representations with generative models [C31][C30][C15]
2018 - 2025	Manfred Diaz (PhD, Montreal, advisor) - Generalization in Reinforcement Learning [W9][W7][J4]
2018 - 2022	J. Krishna Murthy (PhD, Montreal, advisor) - Differentiable World Programs [C32][C27][C21]
2019 - 2020	Bhairav Mehta (MSc, Montreal, co-advisor with Chris Pal) - Sim2real transfer [C33][W15]
2018 - 2020	Gunshi Gupta (MSc, Montreal, advisor) - Look-ahead meta-Learning [C29]
2017 - 2020	Nithin Visisth (MSc, Montreal, advisor) - Task Decomposition using skills
2017 - 2020	Breandan Considine (MSc, Montreal, co-advisor with Michalis Famelis) - Programming tools for intelligent systems with a case study in autonomous robotics [C20][C17]
2017 - 2019	Sai Krishna Gottipati (MSc, Montreal, advisor) - Learning map representations for active SLAM [C9]
2016 - 2020	Teddy Ort (PhD, MIT, mentor) - "Maplite" - Autonomous vehicle navigation without dense maps [C36][J7]
2017-18	Manfred Diaz (MSc, Concordia, co-advisor with Thomas Fevens) - Interactive and Uncertainty-aware Imitation Learning: Theory and Applications [C26]

Mentor / Advisor Undergraduate Students:

2026 - 2026	Shima Shahfar (intern, Montreal)
2025 - 2026	Guillaume Gagne-Labelle (intern, Montreal)
2025 - 2025	Francesco Argenziano (visitor, Montreal)
2024 - 2025	Kumaraditya Gupta (intern, Montreal, advisor)
2024 - 2025	Anshul Gupta (intern, Montreal, advisor)
2024 - 2025	Adam Burhan (intern, Montreal, advisor) - Robustness in SLAM (USRA recipient)
2023 - 2023	Aditya Agarwal (intern, Montreal, advisor) - Robotics vision-language representations
2023 - 2023	Bipasha Sen (intern, Montreal, advisor) - Robotics vision-language representations
2022 - 2023	Atharva Chandak (intern, Montreal, advisor) - Continual object detection
2022 - 2023	Van Nam Vu (intern, Montreal, advisor) - Open-set object detection
2020 - 2021	Kaustubh Mani (intern, Montreal, advisor) - Probabilistic object detection [W11][C19]
2021 - 2021	Nikhil Keetha (intern, Montreal, advisor) - GradSLAM
2020	Charlie Gauthier (intern, Montreal, advisor) - NSERC Undergraduate Student Research Award (USRA)
2019 - 2020	Waleed Khamies (intern, Montreal, advisor) - Inverse variance weighting for reinforcement learning
2019 - 2020	Dishank Bansal (intern, Montreal, advisor) - Probabilistic object detection
2019 - 2020	Amrut Sarangi (intern, Montreal, advisor) - Intention prediction for autonomous driving
2019 - 2020	Mark Van der Merwe (intern, Montreal, advisor) - Dense semantic completion
2019 - 2019	Rohan Raj (intern, Montreal, advisor)
2019 - 2019	Sharath Chandra (intern, Montreal, advisor) - Residual self-play for RL [W14]
2018 - 2019	Dhaivat Bhatt (intern, Montreal, advisor) - Probabilistic object detection

- 2018 Zihan Wang (intern, Montreal, co-advisor with Yoshua Bengio) - Domain adversarial transfer [C34]
- 2018 Bhairav Mehta (intern, Montreal, co-advisor with Chris Pal) - Active domain randomization
- 2018 Sarthak Sharma (intern, Montreal, advisor) - Deep visual odometry
- 2018 Homanga Bharadhwaj (intern, Montreal, co-advisor with Yoshua Bengio) - Domain adversarial transfer [C34]
- 2018 Adam Sigal (intern, Montreal, advisor) - IVADO Undergraduate Research Scholarship
- 2018 Abdelhakim Qbaich (intern, Montreal, advisor) - NSERC Undergraduate Student Research Award (USRA)

Funded Grants

- [G1] Canadian CIFAR AI Chair Renewal. Mar. 2025 - Mar. 2030. Total Value \$1 175 000.
- [G2] “Generating out-of-distribution video for more robust agent navigation and beyond.” *Mila-Samsung*. Co-Principal Investigator with Christopher Pal. 2024-2025. \$90 000.
- [G3] “Generalization and Planning in Robotics.” *NSERC Research Tools and Instruments (RTI)*. Co-Principal Investigator with Glen Berseth. 2024. \$ 150 000.
- [G4] “Learning Actionable and Semantic Representations that Enable Autonomous Mobile Robots to Complete Complex Tasks.” *NSERC Discovery Grant*. Principal Investigator. April 2024 - March 2029. \$205 000.
- [G5] “Deep neural network uncertainty estimation for safe integration into autonomous driving autonomy systems.” NSERC Alliance (ALLRP 580895 – 22) with Denso. May 2023 - May 2025. \$160 800
- [G6] “Continual Few-shot Learning for Autonomous Robots.” Samsung. Co-Principal investigator with Glen Berseth. Aug. 2022 - Aug. 2023. \$56 000.
- [G7] “Developing General Purpose Robots for Planning in Unstructured Environments.” Mila internal funding - Program P2-V5 - Technology Maturation Work with Glen Berseth. Jan. 2022 - Dec. 2024. \$450 000.
- [G8] “Self-supervised representation learning for autonomous driving perception.” Samsung. Co-Principal investigator with Derek Nowrouzezahrai. \$60 000.
- [G9] Fonds d’urgence pour la continuité de la recherche au Canada. Dec. 2020. \$5602.
- [G10] Samsung-Mila Partnership. Co-Principal investigator with Yoshua Bengio, Aaron Courville, Ioannis Mitliagkas, Simon Lacoste-Julien, Guillaume Lajoie, Laurent Charlin, Jian Tang, Jackie Cheung, and Will Hamilton. Sept. 2020 - Sept. 2025. Total value \$4 466 700 split evenly amongst Co-PIs.
- [G11] “Differentiable perception, graphics, and optimization for weakly supervised 3D perception.” *IVADO Fundamental Research Grant*. Co-Principal investigator with James Forbes and Derek Nowrouzezahrai. Sept. 2020 - Sept. 2022. Total Value \$224 598.
- [G12] “Modeling Embodied Agents with Koopman Embeddings.” *CIFAR Catalyst program*. Co-Principal investigator with James Forbes. Sept. 2020 - Sept. 2021. Total value \$50 000. [Press release](#).

- [G13] “Learning Representations from Physical Interaction.” *Microsoft Research*. Co-Principal investigator with Devon Hjelm, Mihai Jalobeanu, Yonatan Bisk, Florian Golemo and Aaron Courville. May 2020 - May 2022. Total value \$112 000.
- [G14] “Exploiting Experiences and Priors in Semantic Visual Navigation.” *Mitacs Accelerate*. Principal investigator. Partner organization Element AI. June 2020 - Dec. 2020. Total value \$30 000.
- [G15] “DEEL - DEpendable & Explainable Learning” *CRIAQ DEEL – NSERC*. Co-Principal investigator and Leader for theme “Robustness”. Jan. 2020 - Jan. 2025. Total value \$5 905 510. \$465 056 allocated to University of Montreal.
- [G16] Canadian CIFAR AI Chair. 2019 - 2024. Total value \$1 050 000.
- [G17] “Unified Hardware Evaluation with Pyrobot and Duckietown” *Facebook PyRobot: Democratizing Robotics*. Principal investigator. Oct. 2019. In-kind contribution of a LoCoBot (value = \$5000 USD).
- [G18] “Uncertainty estimation of perceptual tasks for autonomous vehicles.” Denso research collaboration. Principal Investigator. 2019-2021. Total value \$280 000.
- [G19] NSERC Discovery Launch Supplement (DGEER). 2018-19. Total value \$12 500.
- [G20] “Teaching Robots How to Build Maps with Deep Reinforcement Learning.” *Fonds de recherche nature et technologies Québec (FRQNT) – Établissement de nouveaux chercheurs et de nouvelles chercheuses universitaires*. 2018-2020. Total value \$50 800.
- [G21] “Learning Representations for Autonomous Mobile Robotics to Enable Complex Tasks.” *NSERC Discovery Grant*. Principal investigator. 2018-2023. Total value \$140 000.
- [G22] “Autonomous Mobile Robotics” *Canadian Foundation for Innovation*. Principal investigator. 2018-2023. Total value \$372 230.
- [G23] “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.

Selected Awards

- [A1] Outstanding Early Career Computer Science Researcher Award. *CS-Can/Info-Can*. 2023.
- [A2] Best Paper Award. *IEEE Robotics and Automation Letters*. 2020.
- [A3] CIFAR CCAI Chair Award 2017-2023

Publications

NB: Lead student’s academic advisor is typically listed last.

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**, Sacha Morin, Dominic Maggio, Martin Buchner, Cesar Cadena, Abhinav Valada, Luca Carlone. “Towards Open-World Spatial AI.” in SLAM Handbook. 2026.
- [B2] **Liam Paull**, Mae Seto, Sajad Saeedi, John Leonard. “Navigation for Underwater Vehicles.” in Encyclopedia of Robotics. Springer 2018.

Journal Articles

- [J1] Mostafa ElAraby, Sabyasachi Sahoo, Yann Pequignot, Paul Novello, **Liam Paull**. “GROOD: GRadiant-Aware Out-of-Distribution Detection”. *Transactions on Machine Learning Research*. 2025.
- [J2] Miguel Saavedra, Steven Parkison, Ria Arora, James Richard Forbes, **Liam Paull**. “The Harmonic Exponential Filter for Nonparametric Estimation on Motion Groups”. *IEEE Robotics and Automation Letters (RA-L)*. vol 10, issue 2. 2015.
- [J3] Armin Mokhtarian, Jianye Xu, Patrick Scheffe, Maximilian Kloock, Simon Schafer, Heeseung Bang, Viet-Anh Le, Sangeet Ulhas, Johannes Betz, Sean Wilson, Spring Berman, **Liam Paull**, Amanda Prorok, Bassam Alrifae. “A Survey on Small-Scale Testbeds for Connected and Automated Vehicles and Robot Swarms.” *Robotics and Automation Magazine (RAM)*. 2024. .
- [J4] Manfred Diaz, **Liam Paull**, Andrea Tacchetti. “Rethinking Teacher-Student Curriculum Learning through the Cooperative Mechanics of Experience.” *Transactions on Machine Learning Research*. 2024.
- [J5] Vincent Mai, Philippe Maisonneuve, Tianyu Zhang, Hadi Nekoei, **Liam Paull**, Antoine Lesage-Landry. “Multi-Agent Reinforcement Learning for Fast-Timescale Demand Response of Residential Loads.” *Machine Learning*. vol. 113. p5203-5234. 2024. [link to paper](#).
- [J6] Rey Reza Wiyatno, Anqi Xu, **Liam Paull**. “Lifelong Topological Visual Navigation.” *IEEE Robotics and Automation Letters*. vol. 7, no. 4, p9271-9278, Oct. 2022.
- [J7] 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*. vol. 5, no. 2, p556-563, April 2020. **Winner of 2020 IEEE Robotics and Automation Letters Best Paper Award**.
- [J8] 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*. p37-68. 2020.
- [J9] Sai Krishna, Keehong Seo, Dhaivat Bhatt, Vincent Mai, Krishna Murthy, **Liam Paull**. “Deep Active Localization.” *IEEE Robotics and Automation Letters*. vol. 4, no. 4, p4394-4401, Oct. 2019.
- [J10] 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.” *IEEE Robotics and Automation Letters*. vol. 3, no. 4, p2971-2978. Oct. 2018.
- [J11] **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). p21-45. 2018.

- [J12] 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*. vol. 19, no. 9, p2994-3008. 2018.

Refereed Conference Publications

- [C1] Charlie Gauthier, Sacha Morin, **Liam Paull**. “PerceptTwin: Semantic Scene Reconstruction for Iterative LLM Planning and Verification.” *International Conference on Robotics and Automation*. 2026. Accepted.
- [C2] Kaustubh Mani, Yann Pequignot, Vincent Mai, **Liam Paull**. “SHAPO: Sharpness-Aware Policy Optimization for Safe Exploration.” *International Conference on Learning Representations (ICLR)*. 2026.
- [C3] Christina Kassab, Sacha Morin, Martin Büchner, Matias Mattamala, Kumaraditya Gupta, Abhinav Valada, **Liam Paull**, Maurice Fallon. “OpenLex3D: A Tiered Evaluation Benchmark for Open-Vocabulary 3D Scene Representations.” *NeurIPS 2025 Datasets and Benchmarks Track*. 2025. [project page](#).
- [C4] Miguel Saavedra-Ruiz, Samer B Nashed, Charlie Gauthier, **Liam Paull**. “Perpetua: Multi-Hypothesis Persistence Modeling for Semi-Static Environments.” *IEEE/RSJ International Conference on Intelligent Robots and Systems*. 2025. [project page](#).
- [C5] Luke Rowe, Roger Girgis, Anthony Gosselin, **Liam Paull**, Christopher Pal, Felix Heide. “Scenario Dreamer: Vectorized Latent Diffusion for Generating Driving Simulation Environments.” *IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2025. [project page](#).
- [C6] Kaustubh Mani, Vincent Mai, Charlie Gauthier, Annie Chen, Samer Nashed, **Liam Paull**. “Safety Representations for Safer Policy Learning.” *International Conference on Learning Representations (ICLR)*. 2025
- [C7] Luke Rowe, Roger Girgis, Anthony Gosselin, Bruno Carrez, Florian Golemo, Felix Heide, **Liam Paull**, Christopher Pal. “CtRL-Sim: Reactive and Controllable Driving Agents with Offline Reinforcement Learning.” *Conference on Robot Learning*. 2024.
- [C8] Mostafa ElAraby, Ali Harakeh, **Liam Paull**. “BACS: Background Aware Continual Semantic Segmentation”. *IEEE Conference on Robots and Vision*. 2024.
- [C9] Qiao Gu, Alihusein Kuwajerwala, Sacha Morin, Krishna Murthy Jatavallabhula, Bipasha Sen, Aditya Agarwal, Corban Rivera, William Paul, Kirsty Ellis, Rama Chellappa, Chuang Gan, Celso Miguel de Melo, Joshua B Tenenbaum, Antonio Torralba, Florian Shkurti, **Liam Paull**. “ConceptGraphs: Open-Vocabulary 3D Scene Graphs for Perception and Planning”. *IEEE International Conference on Robotics and Automation (ICRA)*. 2024. [project page](#).
- [C10] Zhen Liu, Yao Feng, Yuliang Xiu, Weiyang Liu, **Liam Paull**, Michael J. Black, Bernhard Schölkopf. “Ghost on the Shell: An Expressive Representation of General 3D Shapes”. *International Conference on Learning Representations (ICLR)*. 2024. **Accepted for Oral Presentation (top 1.2%)**.
- [C11] Sacha Morin, Miguel Saavedra-Ruiz, **Liam Paull**. “One-4-All: Neural Potential Fields for Embodied Navigation”. *IEEE/RSJ International Conference on Intelligent Robots and Systems*. 2023. [project page](#).
- [C12] Krishna Murthy Jatavallabhula, Alihusein Kuwajerwala, Qiao Gu, Mohd Omama, Tao Chen, Shuang Li, Ganesh Iyer, Soroush Saryazdi, Nikhil Keetha, Ayush Tewari, Joshua B Tenenbaum,

- Celso Miguel de Melo, Madhava Krishna, **Liam Paull**, Florian Shkurti, Antonio Torralba. “Conceptfusion: Open-set multimodal 3D mapping”. *Robotics: Science and Systems (RSS)*. 2023. [project page](#).
- [C13] Anas Mahmoud, Jordan SK Hu, Tianshu Kuai, Ali Harakeh, **Liam Paull**, Steven L Waslander. “Self-Supervised Image-to-Point Distillation via Semantically Tolerant Contrastive Loss”. *IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR)*. 2023.
- [C14] Zhen Liu, Yao Feng, Michael J. Black, Derek Nowrouzezahrai, **Liam Paull**, Weiyang Liu. “MeshDiffusion: Score-based Generative 3D Mesh Modeling”. *International Conference on Learning Representations (ICLR)*. 2023. **notable-top-25%**. [project page](#).
- [C15] Ruixiang Zhang, Tong Che, Boris Ivanovic, Renhao Wang, Marco Pavone, Yoshua Bengio, **Liam Paull**. “Robust and Controllable Object-Centric Learning through Energy-based Models”. *International Conference on Learning Representations (ICLR)*. 2023.
- [C16] Ali Harakeh, Jordan Sir Kwang Hu, Naiqing Guan, Steven L. Waslander, **Liam Paull**. “Estimating Regression Predictive Distributions with Sample Networks”. *Conference on Artificial Intelligence (AAAI)*. 2023.
- [C17] Weiyang Liu, Zhen Liu, **Liam Paull**, Adrian Weller, Bernhard Schölkopf. “Structural Causal 3D Reconstruction”. *European Conference on Computer Vision*. 2022.
- [C18] Miguel Saavedra-Ruiz, Sasha Morin, **Liam Paull**. “Monocular Robot Navigation with Self-Supervised Pretrained Vision Transformers”. *19th Conference on Robots and Vision*. 2022.
- [C19] Dhairat Bhatt, Dishank Bansal, Kaustubh Mani, Hanju Lee, Krishna Murthy Jatavallabhula, **Liam Paull**. “f-Cal: Variational calibration of aleatoric uncertainty in neural regression”. *International Conference on Robotics and Automation (ICRA)*. 2022. [project page](#).
- [C20] Vincent Mai, Kaustubh Mani, **Liam Paull**. “Sample Efficient Deep Reinforcement Learning via Uncertainty Estimation”. *The Tenth International Conference on Learning Representations (ICLR)*. 2022. **Presented as spotlight**. [project page](#).
- [C21] Christopher Agia, Krishna Murthy Jatavallabhula, Mohamed Khodeir, Ondrej Miksik, Vibhav Vineet, Mustafa Mukadam, **Liam Paull**, Florian Shkurti. “Taskography: Evaluating robot task planning over large 3D scene graphs”. *Conference on Robot Learning (CoRL)*. 2022. [project page](#).
- [C22] Weiyang Liu, Zhen Liu, Hanchen Wang, **Liam Paull**, Bernhard Schölkopf, Adrian Weller. “Iterative Teaching by Label Synthesis”. *Neural Information Processing Systems (NeurIPS)*. 2021. **Presented as spotlight**.
- [C23] Anthony Courchesne, Andrea Censi, **Liam Paull**. “On Assessing the Usefulness of Proxy Domains for Developing and Evaluating Embodied Agents”. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2021.
- [C24] Weiyang Liu, Rongmei Lin, Zhen Liu, James M Rehg, **Liam Paull**, Li Xiong, Le Song, Adrian Weller. “Orthogonal over-parameterized training”. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2021
- [C25] Philippe Laferrière, Samuel Laferrière, Steven Dahdah, James Richard Forbes, **Liam Paull**. “Deep Koopman Representation for Control over Images (DKRCI)”. *18th Conference on Robots and Vision (CRV)*. 2021.
- [C26] Manfred Diaz, Thomas Fevens, **Liam Paull**. “Uncertainty-Aware Policy Sampling and Mixing for Safe Interactive Imitation Learning”. *18th Conference on Robots and Vision (CRV)*. 2021.

- [C27] J. Krishna Murthy, Miles Macklin, Florian Golemo, Vikram Voleti, Linda Petrini, Martin Weiss, Breandan Considine, Jérôme Parent-Lévesque, Kevin Xie, Kenny Erleben, **Liam Paull**, Florian Shkurti, Derek Nowrouzezahrai, Sanja Fidler. “gradSim: Differentiable simulation for system identification and visuomotor control”. *International Conference on Learning Representations (ICLR)*. 2021. [project page](#).
- [C28] Jacopo Tani, Andrea F Daniele, Gianmarco Bernasconi, Amaury Camus, Aleksandar Petrov, Anthony Courchesne, Bhairav Mehta, Rohit Suri, Tomasz Zaluska, Matthew R Walter, Emilio Frazzoli, **Liam Paull**, Andrea Censi. “Integrated Benchmarking and Design for Reproducible and Accessible Evaluation of Robotic Agents”. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2020. [project page](#).
- [C29] Gunshi Gupta, Karmesh Yadav, **Liam Paull**. “La-MAML: Look-ahead Meta Learning for Continual Learning”. *Neural Information Processing Systems (NeurIPS)*. 2020. [project page](#). **Accepted for oral presentation (top 1.1%)**.
- [C30] Tong Che, Ruixiang Zhang, Jascha Sohl-Dickstein, Hugo Larochelle, **Liam Paull**, Yuan Cao, Yoshua Bengio. “Your GAN is Secretly an Energy-based Model and You Should Use Discriminator Driven Latent Sampling”. *Neural Information Processing Systems (NeurIPS)*. 2020.
- [C31] Zijun Zhang, Ruixiang Zhang, Zongpeng Li, Yoshua Bengio, **Liam Paull**. “Perceptual Generative Autoencoders”. *International Conference on Machine Learning (ICML)*. 2020.
- [C32] Krishna Murthy Jatavallabhula, Ginesh Iyer, **Liam Paull**. “ ∇ SLAM: Dense SLAM meets Automatic Differentiation.” *IEEE International Conference on Robotics and Automation (ICRA)*. 2020. [project page](#).
- [C33] Bhairav Mehta, Manfred Diaz, Florian Golemo, Christopher J Pal, **Liam Paull**. “Active Domain Randomization”. *Conference on Robot Learning*. 2019.
- [C34] 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.
- [C35] 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.
- [C36] 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.

Refereed or Abstract Refereed Workshop Publications

- [W1] Luke Rowe, Rodrigue de Schaetzen, Roger Girgis, Christopher Pal, **Liam Paull**. “Poutine: Vision-Language-Trajectory Pre-Training and Reinforcement Learning Post-Training Enable Robust End-to-End Autonomous Driving”. *CVPR Workshop on Autonomous Driving*. (Unofficial) winner of the Waymo Vision-based End-to-End Driving Challenge. 2025.
- [W2] Francesco Argenziano, Miguel Saavedra-Ruiz, Sacha Morin, Daniele Nardi, **Liam Paull**. “Dynamic Objects Relocalization in Changing Environments with Flow Matching”. *IROS 2025 Workshop - Perception and Planning for Mobile Manipulation in Changing Environments*. 2025.
- [W3] Steven A. Parkison, Miguel Saavedra-Ruiz, Ria Arora, James Richard Forbes, and **Liam Paull**. “The Harmonic Exponential Filter for Recursive Nonparametric Estimation on Motion Groups”.

- IROS 2023 Workshop on Robotic Perception and Mapping: Frontier Vision & Learning Techniques*. 2023.
- [W4] Florian Golemo, Simon Chamorro, Martin Weiss, **Liam Paull**, Christopher Pal. “A Hierarchical Reinforcement Learning Approach to Control Legged Mobile Manipulators”. *Learning for Agile Robotics Workshop at CoRL 2022*. 2023.
- [W5] Charlie Gauthier, Florian Golemo, Glen Berseth, **Liam Paull**. “Fearful Goal Generation for Reliable Policy Learning”. *Learning for Agile Robotics Workshop at CoRL 2022*. 2022.
- [W6] Mostafa ElAraby, Ali Harakeh, **Liam Paull**. “Continual Semantic Segmentation with Background Shift Correction”. *Workshop track of the Conference on Lifelong Learning Agents*. 2022.
- [W7] Manfred Diaz, Charlie Gauthier, Glen Berseth, **Liam Paull**. “Generalization Games for Reinforcement Learning”. *ICLR 2022 Workshop on Gamification and Multiagent Solutions* and *ICLR 2022 Workshop on Agent Learning in Open-Endedness*. 2022.
- [W8] Vincent Mai, Kaustubh Mani, **Liam Paull**. “IV-RL: Leveraging Target Uncertainty Estimation for Sample Efficiency in Deep Reinforcement Learning”. *Reinforcement Learning for Real Life Workshop at ICML 2021*. 2021.
- [W9] Manfred Diaz, **Liam Paull**, Pablo Samuel Castro. “LOCO: Adaptive exploration in reinforcement learning via local estimation of contraction coefficients”. *Self-Supervision for Reinforcement Learning Workshop - ICLR 2021*. 2021.
- [W10] Vincent Mai, Waleed Khamies, **Liam Paull**. “Batch Inverse-Variance Weighting: Deep Heteroscedastic Regression”. *Uncertainty in Deep Learning (UDL) workshop at ICML 2021*.
- [W11] Dhairvat Bhatt, Dishank Bansal, Gunshi Gupta, Hanju Lee, Krishna Murthy Jatavallabhula, **Liam Paull**. “Probabilistic Object Detection: Strengths, Weaknesses, Opportunities”. *ICML Workshop on AI for Autonomous Driving*. 2020. [project page](#).
- [W12] **Liam Paull**, Anthony Courchesne. “On Assessing the Value of Simulation for Robotics”. *RSS 2020 Workshop on Closing the Reality Gap in Sim2Real Transfer for Robotics*. 2020. [Paper video](#).
- [W13] Sharath Chandra Raparthy, Melissa Mozifian, **Liam Paull**, Florian Golemo. “CuNAS - CUriosity-driven Neural-Augmented Simulator”. *RSS 2020 Workshop on Closing the Reality Gap in Sim2Real Transfer for Robotics*. 2020. [Video](#)
- [W14] Raparthy, Sharath Chandra; Mehta, Bhairav J; Golemo, Florian; **Liam Paull**. “Generating Automatic Curricula via Self-Supervised Active Domain Randomization.” *ICLR 2020 Workshop on Beyond “Tabula Rasa” in Reinforcement Learning (BeTR-RL)*.
- [W15] Mehta, Bhairav J; Deleu, Tristan; Raparthy, Sharath Chandra; Pal, Chris J; **Liam Paull**. “Curriculum for Gradient-Based Meta-Learners.” *ICLR 2020 workshop on Beyond “Tabula Rasa” in Reinforcement Learning (BeTR-RL)*.
- [W16] Andrea Censi, **Liam Paull**, Jacopo Tani, Matthew R. Walter. “The AI Driving Olympics: An Accessible Robot Learning Benchmark.” *NeurIPS 2019 workshop on Machine Learning Competitions for All (CiML 2019)*. Accepted for oral.
- [W17] Breandan M Considine, Michalis Famelis, **Liam Paull**. “Kotlin ∇ : A Shape Safe eDSL for Differentiable Functional Programming.” *NeurIPS 2019 workshop on Program Transformations*. Accepted as Poster.

- [W18] Zijun Zhang, Ruixiang Zhang, Zongpeng Li, Yoshua Bengio, **Liam Paull**. “Perceptual Generative Autoencoders.” *ICLR Workshop on Deep Generative Models for Highly Structured Data*. 2019.
- [W19] Bhairav Mehta, Manfred Diaz, Florian Golemo, Christopher Pal, **Liam Paull**. “Active Domain Randomization” *The 4th Multidisciplinary Conference on Reinforcement Learning and Decision Making*. 2019.
- [W20] Breandan Considine, Ruslan Hristov, **Liam Paull**. “Duckietown: Software Infrastructure for Autonomous Robotics.” *IROS 2018 Workshop: Automating Robot Experiments*. 2018.
- [W21] 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, Alejandro Ungchia, 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*. 2018.
- [W22] 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*. 2018. [project page](#).

Manuscripts, Preprints and Submissions

- [C37] Sacha Morin, Kumaraditya Gupta, Mahtab Sandhu, Charlie Gauthier, Francesco Argenziano, Kirsty Ellis, **Liam Paull**. “Agentic Scene Policies: Unifying Space, Semantics, and Affordances for Robot Action”. Under Review.
- [C38] Anthony Gosselin, Ge Ya Luo, Luis Lara, Florian Golemo, Derek Nowrouzezahrai, **Liam Paull**, Alexia Jolicoeur-Martineau, Christopher Pal. “Ctrl-Crash: Controllable Diffusion for Realistic Car Crashes”. Under Review.

Academic Services

Conference / Challenges / Workshops Organized

- IROS 2025 Workshop on Perception and Planning for Mobile Manipulation in Changing Environments
- IROS 2024 Workshop “Standing the Test of Time: Retrospective and Future of World Representations for Lifelong Robotics”
- Driving SMARTS (NeurIPS) 2022 - led by Amir Rasouli
- The AI Driving Olympics VI live competition at Neural Information Processing Systems (NeurIPS) 2021
- IROS 2021 Workshop on Evaluating the Broader Impacts of Self-Driving Cars

- IJCAI 2021 Reinforcement Learning for Intelligent Transportation Systems (RL4ITS) Workshop
- NeurIPS 2020 Workshop on Differentiable Computer Vision, Graphics, and Physics in Machine Learning
- IROS 2020 Workshop on Benchmarking Progress in Autonomous Driving (Deferred from ICRA 2020 due to COVID-19)
- The AI Driving Olympics V live competition at Neural Information Processing Systems (NeurIPS) 2020
- The AI Driving Olympics IV live competition at the International Conference on Robotics and Automation (ICRA) 2020 (Canceled due to COVID-19)
- The AI Driving Olympics III live competition at Neural Information Processing Systems (NeurIPS) 2019
- The AI Driving Olympics II live competition at the International Conference on Robotics and Automation (ICRA) 2019
- The AI Driving Olympics I live competition at the Neural Information Processing Systems (NeurIPS) 2018

Grant Review Services

- IVADO Postdoctoral Scholarship Award selection committee 2020
- NSERC Discovery Grant reviewer 2019-2025
- Canadian Foundation for Innovation John R. Evans Leaders Fund reviewer 2019, 2021,2025
- IVADO Fundamental Resesarch Grant selection committee 2017
- NSERC Mitacs Accelerate reviewer 2017-2025

Conference Program / Editorial Committees

- Senior Area Chair: Robotics: Science and Systems 2025
- Scientific and Organizing Committee: Forum Mobilit.AI 2024, 2025
- Program Committee: CIFAR DLRL Summer School 2021 and 2023
- General Chair: CS-CAN / CRV / CANAI (2023) led by Dave Meger
- Area Chair: Robotics: Science and Systems (2023, 2024)
- Editor: IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2022-2024)
- Program Chair: IEEE Conference on Computer and Robot Vision (CRV) 2020 and 2021
- Area Chair: International Conference on Computer Vision (ICCV) 2021
- Area Chair: Conference on Robot Learning (CoRL) 2019
- Associate Editor: IEEE/RSJ International Conference on Intelligent Robots and Systems IROS 2017-19
- Associate Editor: Robotics and Automation Letters (RA-L) 2017-22
- Associate Editor: IEEE International Conference on Robotics and Automation (ICRA) 2016
- Program Committee: Neural Information Processing Systems (NeurIPS) 2020-21
- Program Committee: Conference on Robot Learning (CoRL) 2022-2024
- Program Committee: Robotics: Science and Systems (RSS) 2015-18
- Program Committee: IEEE Conference on Computer and Robot Vision (CRV) 2018-19

Selected Journals and Conferences Reviewed

- Conference on Robot Learning (CoRL)
- 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)

Other Committees and Service

- CIFAR National Program Committee
- Member of the Mila Process Improvement Committee (2025-present)
- Member of the Mila Social Committee (2024-present)
- Member of the Mila Mental Health Committee (2023-2024)
- Member of the Courtois Institute Management Committee (2023-present)
- Member of DEEL Scientific Committee 2021-present
- CIFAR Deep Learning Reinforcement Learning Summer School Program Committee 2021, 2023
- DIRO Faculty Recruitment Committee 2020-present
- Presenter at Séjour informatique (undergraduate recruiting event) 2018, 2019
- DIRO Student Recruitment Committee 2017-2020

Outreach

2021	Parlons IA
2020	Mount Pleasant elementary
2019	Selwyn House high school career day
2019-2020	Hudson CodeClub
2019	Robotics Week - Our Lady of Peace elementary
2018	Let's Talk Science - Canada2067

Recent Invited Talks and Panels

06/2024	Mila Robotics Summer School
05/2024	Mila RL Workshop
01/2024	AI and Robustness
01/2024	McGill AI Learnathon
11/2023	ETH Zurich Autonomy Talks
10/2023	ISAE-Supaero DISC Seminar
10/2023	SuReLi Seminar

06/2023	NSERC Canadian Robotics Network (NCRN) Annual General Meeting
06/2023	Mila Robotics Summer School
10/2022	IROS Workshop on Miniature Robots for Full Scale Autonomous Vehicle Research
07/2022	RSS Workshop on Robot Learning in the Cloud
06/2022	CMU RISS RoboLaunch
06/2022	Technical Committee on Verification of Autonomous Systems monthly webinar
05/2022	Robohub Podcast
12/2021	Deep RL Workshop at NeurIPS 2021. “The AI Driving Olympics.”
06/2021	Canadian Mathematical Society 75+1 Anniversary Summer Meeting. “Training Robots in Simulators.”
05/2021	MobiliT.ai “Quantifying Uncertainty in Deep Learning Based Perception Systems.”
03/2021	IVADO Cafe Scientifique.
12/2020	Reinforcement Learning Algorithms & Applications Virtual Seminar Series [video]
11/2020	iMLSE. “Robotics, Deep Learning, and Software 2.0.”
08/2020	Workshop on Benchmarking in Robotics
06/2020	Mila Tea Talk. “Some Challenges for Efficiently Deploying Robots in Unstructured Environments.”
04/2020	NCRN Distal Fellows Web Seminar
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 Keynote
06/2018	Element AI, Toronto
05/2018	Honeywell Symposium Keynote Address, Atlanta
04/2018	Fourth IEEE Research Boost, Montreal
04/2018	Google Brain, Montreal
01/2018	Université de Laval, Quebec City
12/2017	McGill University SOCS Colloquium

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)

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