

Julie Alhosh

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/JulieAlhosh

EDUCATION

MSc in Computer Science, Mobile Robotics Lab at McGill University/Mila SEP 2022 – DEC 2024

- Thesis: Learning-based active sampling and modeling of aquatic environments
- Supervisor: Prof. David Meger
- Courses: Reinforcement Learning, Applied Robotics, Fundamentals of Computer Vision, Intelligent Robotics
- CGPA: **4.0**/4.0

BSc in Honours Mathematics and Computer Science, McGill University SEP 2018 – APR 2021

- First Class Honours and distinction
- Courses: Artificial Intelligence, Applied Machine Learning, Computational Perception
- CGPA: **3.87**/4.0

EXPERIENCE

AI Developer, *Robotics and AI*, Vention Inc. JUL 2025 – PRESENT

- Optimize the speed, performance, and robustness of the bin picking pipeline
- Improve the adaptability of the bin picking pipeline and evaluate its generalizability to new parts
- Implement a simulation infrastructure to enable the development and testing of bin picking in simulation

Graduate Researcher, *Robotics and ML*, McGill University/Mila SEP 2021 – JUL 2025

- Designed and deployed BoatGym, a scalable simulation environment for RL-based adaptive sampling and path planning in aquatic environments
- Developed deep RL models for adaptive sampling and temperature estimation, reducing sample requirements by 50%. Results submitted to ICRA 2026
- Contributed to a project in autonomous off-road mapless navigation using only vision and GPS, published at ICRA 2025
- Experience with deploying two different robot platforms (skid-steered Clearpath Husky and BlueBoat ASV)
- Supervisor: Prof. David Meger

Projects in Robotics, RL, and CV, McGill University

- Reproduced the paper "Making Deep Q-learning Methods Robust to Time Discretization" MAY 2023 by implementing and testing the Deep Advantage Updating algorithm (DAU) and the DQN algorithm
- Developed and simulated robotic applications using ROS and Gazebo with the Kinova DEC 2022 Gen3Lite arm. Implemented control, and planning strategies. Executed pick-and-place tasks in simulation
- Reproduced the paper "Robust Adversarial Reinforcement Learning" (RARL) by DEC 2022 implementing and testing the RARL approach with state-of-the-art RL algorithms, TD3 and PPO
- Designed and implemented a method for generating Bird's Eye View (BEV) representations NOV 2022 from tilted-camera video footage

Teaching Assistant, McGill University

- Artificial Intelligence (AI), COMP 424 SEP – DEC 2023
- Computational Perception, COMP 546 SEP – DEC 2022
- Programming Languages and Paradigms, COMP 302 SEP – DEC 2020

Research Assistant, *RL*, McGill University

NOV 2021 – JUN 2022

- Proved the convergence of the statistical HJB loss. Results published at RLDM 2025
- Investigated state-of-the-art Distributional RL and continuous-time RL methods
- Supervisor: Prof. David Meger

Research Assistant, *Mathematics/algebraic geometry*, McGill University

MAY – AUG 2020, 2021

- Proved that Kontsevich’s flows on two-dimensional quasi-homogeneous Poisson structures are trivial
- Further developed the “starproduct” SageMath software package for calculations with Poisson brackets and their quantizations, by implementing the action of GRT on Poisson structures
- Calculated examples of Kontsevich’s flows on two-dimensional Poisson structures
- Supervisor: Prof. Brent Pym

TECHNICAL SKILLS AND CERTIFICATIONS

- **Programming Languages:** Python, C/C++, Java, MATLAB, Bash
- **Libraries and ML Frameworks:** PyTorch, TensorFlow, NumPy, OpenCV, Gymnasium, Hydra
- **Platforms:** ROS/ROS2, HPC, CUDA, Git, Linux
- **Certification:** Trustworthy and Responsible AI Learning Certificate, Mila (MAR 2024)

PUBLICATIONS

- **J. Alhosh**, H. Wiltzer, and D. Meger. Tractable representations for convergent approximation of distributional HJB equations. In *Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM)*, Dublin, Ireland, 2025. URL <https://arxiv.org/abs/2503.05563>
- J.-F. Tremblay, **J. Alhosh**, L. Petit, F. Lotfi, L. Landauro, and D. Meger. Topological mapping for traversability-aware long-range navigation in off-road terrain. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Atlanta, USA, 2025. URL <https://arxiv.org/abs/2410.0192>

PROFESSIONAL ACTIVITIES

- Reviewer for ICRA 2024 - 25, IROS 2025
- Marine Robotics Workshop and Field Trials 2023, 2024, 2025
Bellairs Research Institute, Holetown, Barbados
- NSERC Canadian Robotics Network (NCRN) Field Trials 2023, 2024
Gull Lake, ON, Canada
- The Cornell, Maryland, Max Planck Pre-doctoral Research School (CMMRS) 2020
Max Planck Institute for Software Systems, Saarbrücken, Germany
- CVR - VISTA Vision Science Summer School, Centre for Vision Research (CVR), 2020
York University, Toronto, ON, Canada

AWARDS AND SCHOLARSHIPS

- Excellence Bursary for Computer Science, Ministère de l’Enseignement supérieur (\$1,000) JUN 2021
- ISM Undergraduate Summer Scholarship (\$5,000) MAY 2021
- FRQNT Supplement to the NSERC USRA (\$1,500) AUG 2020
- NSERC Undergraduate Student Research Award (\$7,000) MAY 2020
- Heather Munroe-Blum Leadership Award (\$47,000) SEP 2018