Julie Alhosh

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/JulieAlhosh Montréal, Canada

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 — CGPA: **4.0**/4.0
- Supervisor: Prof. David Meger
- Courses: Reinforcement Learning, Applied Robotics, Fundamentals of Computer Vision, Intelligent Robotics

BSc in Honours Mathematics and Computer Science, McGill University — Sep 2018 – Apr 2021
- First Class Honours and distinction — CGPA: **3.87**/4.0
- Courses: Artificial Intelligence, Applied Machine Learning, Computational Perception, Cryptography

Experience

AI Developer, *Physical AI*, Vention Inc. — Jul 2025 – Present
- Using NVIDIAs latest foundation models in a bin-picking pipeline
- Optimize the pipelines speed, robustness, and overall performance for efficient real-world deployment.
- Improve the pipelines adaptability and systematically evaluate its generalization to previously unseen part geometries and configurations
- Design and implement visualization tools to monitor, debug, and analyze bin-picking runs, enabling deeper insights into model behavior and performance

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

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

Publications

- **Julie Alhosh**, Harley Wiltzer, and David 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

- Jean-François Tremblay, **Alhosh, Julie**, Louis Petit, Faraz Lotfi, Lara Landauro, and David Meger. Topological mapping for traversability-aware long-range navigation in off-road terrain. In *2025 IEEE International Conference on Robotics and Automation (ICRA)*, pages 14850–14856, 2025. doi: 10.1109/ICRA55743.2025.11128536

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