

Julie Alhosh

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/julie-alhosh

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
- CGPA: **4.0**/4.0

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

- First Class Honours and distinction
- CGPA: **3.87**/4.0

EXPERIENCE

Robotics and Machine Learning, *Graduate Researcher*, McGill University/Mila SEP 2021 – PRESENT

- Developed and deployed BoatGym, a simulation environment for reinforcement learning (RL), enabling testing and optimization of RL models for aquatic environmental monitoring using an ASV
- Developed and fine-tuned scalable machine learning models for path planning, adaptive sampling, and surface temperature modeling, achieving higher accuracy in temperature prediction with 50% fewer samples
- Worked on a project in an autonomous off-road mapless navigation pipeline using only vision and GPS
- Experience with deploying two different robot platforms (skid-steered Clearpath Husky and BlueBoat ASV)
- Supervisor: Prof. David Meger

Computer Vision, Machine Learning, and Reinforcement Learning Projects, 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
- 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
- Developed and implemented a method to generate a Bird's Eye View (BEV) of a scene NOV 2022

Teaching Experience, *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

Mathematical Research

Research Assistant, 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
- **Libraries and Frameworks:** NumPy, PyTorch, TensorFlow, Hydra, Docker, Git, CUDA, ROS/ROS2
- **Certification:** Trustworthy and Responsible AI Learning Certificate, Mila (MAR 2024)

FIELD TRIALS, WORKSHOPS, AND PROFESSIONAL DEVELOPMENT

- Presentation: “*Active Sampling, Modeling and Estimation in Aquatic Environments*”
Université de Sherbrooke, QC, Canada AUG 2024
- Reinforcement Learning Conference (RLC), Amherst, MA, USA AUG 2024
- NSERC Canadian Robotics Network (NCRN) Field Trials, Gull Lake, ON, Canada JUN 2023, 2024
- IEEE International Conference on Robotics and Automation (ICRA), Yokohama, Japan MAY 2024
- Barbados Marine Field Trials, Bellairs Research Institute, Holetown, Barbados FEB 2023, 2024
- The Cornell, Maryland, Max Planck Pre-doctoral Research School (CMMRS),
Max Planck Institute for Software Systems, Saarbrücken, Germany AUG 2020
- CVR - VISTA Vision Science Summer School, Centre for Vision Research (CVR),
York University, Toronto, ON, Canada JUL 2020

PUBLICATIONS

- 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>

AWARDS AND SCHOLARSHIPS

- Excellence Bursary for Computer Science, awarded by the Ministère de l’Enseignement supérieur (MES) to graduates based on their CGPA (\$1,000) JUN 2021
- Heather Munroe-Blum Leadership Award SEP 2018
- 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