Julie Alhosh

julialhosh@gmail.com +1 (438) 998-2325 julialhosh.github.io/ /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 Reinfrocement Learning Projects, 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
- 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
- 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

Reinforcement Learning (RL) Research, *Research Assistant*, McGill University — Nov 2021 – Jun 2022

- Proved the convergence of the quantile imputation strategy and the statistical HJB loss function
- Studied state-of-the-art Distributional RL and continuous-time RL methods
- Supervisor: Prof. David Meger

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)

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

Field Trials, Workshops, and Professional Development

- Barbados Marine Field Trials, Bellairs Research Institute, Holetown, Barbados — 2023, 2024, 2025
- 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
- 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

Volunteering

- Science Outreach Volunteer, *Biodiversity Festival: Open Day*, Gault Nature Reserve — Oct 2024
- Science Outreach Volunteer, *24 Hours of Science*, Gault Nature Reserve — May 2024
- Computer Science Tutor, *McGill University* — 2019 – 2021
- Volunteer, *Montreal Childrens Hospital* — 2017 – 2018
- Math and Science Tutor, *Tutoring and Academic Success Center, Vanier College* — 2017 – 2018

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
- 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