BEN AGRO

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EXPERIENCE

Waabi
📅 *May 2022 - Present*

Autonomous Driving Research Intern, supervised by Sergio Casas and Raquel Urtasun

Implicit scene representation for perception and prediction in self-driving:
- Designed a novel implicit architecture for predicting occupancy and motion from LiDAR and map evidence.
- Surpasses state-of-the-art methods in occupancy and motion prediction accuracy and inference time.
- Contributed to a large code base with industry-standard software engineering practices.
- Submitted a paper to CVPR 2023.

Robotics Vision and Learning Lab
📅 *May 2021 - Sept 2021*

Undergraduate Researcher, supervised by Florian Shkurti

Learning search for robotic *task and motion planning*:
- Developed a simulated testing environment and data generation/training pipeline (python & Drake).
- Implemented sample-based motion planning and object grasp/placement selection.
- Extended PDDLStream with learned stream-scoring (PyTorch) and a queue-based planning algorithm.
- Deployed system on Franka Emika Panda robot arm (C++).
- Wrote and submitted a paper to CoRL 2022.

Autonomous Space and Robotics Lab
📅 *May 2020 - Aug 2020*

Undergraduate Researcher, supervised by Tim Barfoot

Self-supervised semantic LiDAR segmentation for autonomous navigation:
- Developed a simulation (with Gazebo) with human actors and randomized scenario generation to provide ground-truth LiDAR classes.
- Built the training/testing pipeline. (C++, python, bash, Docker).
- Wrote an augmented navigation stack for a mobile robot that triaged LiDAR data by semantic class (ROS).

EDUCATION

PhD in Computer Science, University Of Toronto
📅 *2023-Present*

Supervisor: Raquel Urtasun. In progress.

B.ASc. in Engineering Science, University Of Toronto
📅 *2019-2023*

Majored in Robotics; CGPA = 4.0, Cumulative Average = 97%

PUBLICATIONS

B. Agro, Q. Sykora, S. Casas, and R. Urtasun, "Implicit Occupancy Flow Fields for Perception and Prediction in Self Driving", *CVPR **(Highlight)***, 2023. 🔗 Website - 📄 Paper - 📄 Supplementary

M. Khodeir[1], **B. Agro**[1], and F. Shkurti, "Learning to Search in Task and Motion Planning with Streams", *RA-L*, 2022. 🔗 Website - ⬡ Code - 📄 Paper.

H. Thomas, **B. Agro**, M. Gridseth, J. Zhang, and T. Barfoot. "Self-Supervised Learning of Lidar Segmentation for Autonomous Indoor Navigation," *ICRA*, 2021. ▶ Video - ⬡ Dataset - ⬡ Method - 📄 Paper.

AWARDS

John Black Aid Scholarship (Highest academic standing of any UofT undergraduate student), Governer General's Silver Medal, Centennial Senior Project Award, Ontario Professional Engineers Foundation for Education Gold Medal for Academic Achievement, W.S. Wilson Medal, AP National Scholar (Canada), University of Toronto Excellence Award, University of Toronto Scholar, Governor Generals Bronze Medal, Duke of Edinburgh Gold Award

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[1]Authors contributed equally