Rowan Dempster

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Skills

Programming: C++, Python, Java, JavaScript, ReactJS, GraphQL, Relay

Environments/Toolboxes: PyTorch, CasADi, Git, ROS, Linux, Docker, CARLA Simulator

Education

University of Waterloo, *Electrical and Computer Engineering, MASc* **Grad: 2022**

- Research in motion planning for automated driving. Thesis work on graphical models for decision making (accepted, ICRA 2022), action classification, and predictive control schemes.
- Recipient of the NSERC Alexander Graham Bell Canada Graduate Scholarship.
- 94% average in courses including Optimal Control and MPC, Computational Vision, and Reinforcement Learning

University of Waterloo, *Bachelor of Computer Science* **Conferred: Jun 2020**

- Dean's Honours List (90% average), 2x recipient of the NSERC Undergraduate Student Research Award (USRA).
- Completed 6/6 co-op placements, earning 5 Outstanding and 1 Excellent work term evaluations.
- Excelled in MTE544 (Autonomous Mobile Robots), ECE493 (Autonomous Vehicles), CS486 (Intro to AI), CS480 (Intro to ML), CS456 (Computer Networks), and CS458 (Computer Security and Privacy).

Industry Experience

Matician, *Research Engineer* **Sep 2021 — Dec 2021**

- Research in self-supervised learning (SSL) for scene reconstruction via dense stereo in mapping applications.
- Introduced visual odometry to the SSL pipeline, allowing for photometric loss computations across time, increasing reconstruction accuracy.

Facebook, *Software Engineer* **Jan 2019 — Apr 2019**

Zynga, *Software Engineer (Analytics)* **May 2018 — Aug 2018**

Sony Creative Software, *Software Engineer* **Sep 2017 — Dec 2017**

Kik Interactive, *Android Developer* **Jan 2017 — Apr 2017**

TribalScale, *Software Engineer* **May 2016 — Aug 2016**

Research Experience

WATonomous - Automated Driving Research and AutoDrive Challenge Team **Sep 2017 — Present**

From Fall 2017 to Spring 2021, myself and the WATonomous team competed in the SAE AutoDrive Challenge (ADC). We now independently conduct impactful research and system develop work, contributing to the research community.

Director - Autonomous Software **Jun 2021 — Present**

- Leading WATonomous' post-ADC automated driving research and system development efforts.
- Research work follows my thesis: *DRG: A Dynamic Relation Graph for Unified Prior-Online Environment Modeling* (accepted, ICRA 2022), *Action Detection and Classification of Active Agents in Road Scenes* (targeting RA-L), *Simultaneous Local Planning and Control via MPC* (targeting TMECH).
- System development goals carry on from where ADC left off: Driving in more complicated scenarios including lead vehicle overtaking and intersection negotiation.

Director - Motion Planning (ADC Year 4) **Sep 2020 — Jun 2021**

- Headed a team of 25 undergraduate and graduate students as we overhauled the motion planning stack, incorporating Lanelet2 mapping, relation graph based environment modeling, and model predictive control.
- The team's final design earned 2nd place in the ADC Year 4 competition, demo: youtu.be/DNZgheT4Y2s?t=151

Team Captain (ADC Year 2 & 3) **Aug 2018 — May 2020**

- Led 100+ software, electrical, and mechanical engineers as we transformed a Chevrolet Bolt into a Level 4 autonomous vehicle.
- Achieved 3rd place in the ADC Year 3 competition (up from 8th place in Year 2) by defining a range of organizational policies aimed at increasing the team's efficiency.

Tech Lead - Trajectory Generation (ADC Year 1) **Sep 2017 — May 2018**

- Oversaw 14 students as we used ROS and C++ to create a custom costmap environment representation and implement a modified RRT* path search algorithm.