Luke Rowe

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Education

Mila / University of Montreal • Montreal, QC — Sep 2023 – Present
Ph.D. Computer Science • ***Advisors**: Prof. Chris Pal and Prof. Liam Paull*

University of Waterloo • Waterloo, ON — Sep 2021 – Aug 2023
MMath Computer Science • ***Advisor**: Prof. Krzysztof Czarnecki*
Thesis: FJMP: Factorized Joint Multi-Agent Motion Prediction

University of Victoria • Victoria, BC — Nov 2020
BSc. (Hon) Computer Science and Mathematics • *GPA: 8.96/9.0*

Experience

PhD Research Intern – Torc Robotics — May 2024 – Aug 2024
Montreal, QC

- Designed a fully data-driven generative simulator for autonomous vehicle planners, based on a vectorized latent diffusion model for initial scene generation (HD-map + bounding boxes).

Research Assistant – REAL Lab, Mila — Sep 2023 – Apr 2024
Montreal, QC

- Designed a controllable multi-agent simulation framework for autonomous driving scenarios with offline reinforcement learning, based on an encoder-decoder Transformer architecture.

Research Assistant – *WISE Lab, Univ. of Waterloo* — Sep 2021 – Aug 2023
Waterloo, ON

- Developed a joint motion prediction framework for autonomous driving scenarios that ranks first on the multi-agent benchmark of the INTERACTION dataset.

Undergraduate Research Assistant, Tzanetakis Lab – *Univ. of Victoria* — May 2020 – Apr 2021
Victoria, BC

- Implemented a Transformer architecture that performed state-of-the-art on the task of automatic chord recognition.

Junior Software Developer, Intern – *Latitude Technologies* — Summer 2019
Victoria, BC

- Developed a system to support user-configurable aircraft event notifications in Latitude's web applications.

Publications

Scenario Dreamer: Vectorized Latent Diffusion for Generating Driving Simulation Environments
***Luke Rowe**, Roger Girgis, Anthony Gosselin, Liam Paull, Christopher Pal, Felix Heide*
CVPR, 2025

CtRL-Sim: Reactive and Controllable Driving Agents with Offline Reinforcement Learning
Luke Rowe, Roger Girgis*, Anthony Gosselin, Bruno Carrez, Florian Golemo, Felix Heide, Liam Paull, Christopher Pal*
CoRL, 2024

Amortizing intractable inference in diffusion models for vision, language and control
Siddarth Venkatraman, Moksh Jain*, Luca Scimeca*, Minsu Kim*, Marcin Sendera*, Mohsin Hasan, **Luke Rowe**, Sarthak Mittal, Pablo Lemos, Emmanuel Bengio, Alexandre Adam, Jarrid Rector-Brooks, Yoshua Bengio, Glen Berseth, Nikolay Malkin*
NeurIPS, 2024

FJMP: Factorized Joint Multi-Agent Motion Prediction over Learned Directed Acyclic Interaction Graphs
***Luke Rowe**, Martin Ethier, Eli-Henry Dykhne, Krzysztof Czarnecki*
CVPR, 2023

Out-of-Distribution Detection for LiDAR-based 3D Object Detection
*Chengjie Huang, Van Duong Nguyen, Vahdat Abdelzad, Christopher Gus Mannes, **Luke Rowe**, Benjamin Therien, Rick Salay, Krzysztof Czarnecki*
IEEE Intelligent Transportation Systems Conference, 2022

Curriculum Learning for Imbalanced Classification in Large Vocabulary Automatic Chord Recognition
Luke Rowe, *George Tzanetakis*
International Society for Music Information Retrieval Conference, 2021

Teaching

Teaching Assistant – *Dept. of Computer Science, University of Waterloo* Fall 2021 – Present
CS 135 (Fall 2021), CS 360 (Winter 2022, Spring 2022, Fall 2022, Winter 2023, Spring 2023)

Teaching Assistant – *Dept. of Computer Science, University of Victoria* Fall 2019
CSC 320

Awards and Scholarships

- NSERC Doctoral Scholarship ($120,000 CAD) (Sep 2024 - Aug 2027)
- FRQNT Doctoral Scholarship ($100,000 CAD) (Sep 2024 - Aug 2028)
- Ontario Graduate Scholarship ($30,000 CAD) (Sep 2021, Sep 2022)
- President's Graduate Scholarship ($20,000 CAD) (Sep 2021, Sep 2022)
- NSERC USRA ($5,625 CAD) (May 2020)