

## Education

### University of Toronto

#### Master of Science in Applied Computing, Artificial Intelligence Concentration Sept '23 – Dec '24 (expected)

- 4.0 GPA with courses in natural language processing, spoken language processing, and advanced data systems.
- Vector Scholarship in Artificial Intelligence, worth \$17 500 CAD.

### University of Waterloo

#### Bachelor of Computer Science, Honours, Co-operative Program, AI Specialization Sept '18 – Apr '23

- 93.50 major average, with courses in computer vision, robotics, and machine learning.
- 

## Peer-Reviewed Publications

**Sim-to-Real Domain Adaptation for Lane Detection and Classification in Autonomous Driving** June 2022

**Application of Machine Learning for Drone Classification Using Radars** April 2021

---

## Relevant Work Experience

### NVIDIA

SANTA CLARA, CA

#### Deep Learning Researcher for Autonomous Vehicles

May '24 – Present

- Designing and implementing novel self-supervised learning experiments for LiDAR data.
- Developing bespoke visualizations and metrics to evaluate self-supervised learning experiments.
- Interpreting and communicating results to stakeholders weekly.

### Cruise

SAN FRANCISCO, CA

#### Model Deployment Platform Engineer

Sept '22 – Dec '22

- Designed and developed debugging tools to assist in deep learning model deployment, reducing deployment time by days in some cases.
- Built a tool to automatically assess numerical divergence between the original PyTorch models and optimized [TensorRT](#) models, allowing deployment engineers to quickly identify optimization errors.
- Built a linter to map [ONNX](#) nodes to lines in PyTorch source code, saving deployment engineers hours of manual debugging every deployment.
- Created a tool to manually add outputs to exported [ONNX](#) graphs, allowing engineers to inspect intermediate activations while debugging models.

### NVIDIA

SANTA CLARA, CA (REMOTE)

#### Deep Learning Researcher for Autonomous Vehicles

Jan '22 – Apr '22

- Designed and iterated on multiple experiments for a LiDAR object detection neural network, improving cyclist and pedestrian detections by 43% and 15%, respectively.
- Implemented sparse tensor object detectors using [Minkowski Engine](#), outperforming the production model while using 70% less memory.
- Presented a 30-minute research overview to the organization, communicating 4 months worth of findings and insights to internal stakeholders and leadership.
- Integrated confidence predictions into a LiDAR object detection auto-labeling pipeline, allowing human annotators to focus efforts on anomalous and challenging data instances.

### DarwinAI

WATERLOO, ON (REMOTE)

#### Machine Learning Developer

May '21 – Aug '21

- Built and tested defect detection deep learning solutions for clients in the manufacturing industry, working in cross-functional teams and presenting results to stakeholders weekly.
- Trained XGBoost and SVR systems to model the relationship between environmental conditions and yield for an agriculture client, giving the client insight into how they can optimize their facility to maximize their yield.
- Implemented the core functionality of Dataset Distillation using the autograd package, to pursue research in low-data machine learning contexts.
- Reformulated defect detection as an unsupervised anomaly detection task, by implementing autoencoder experiments in PyTorch and validating them on client datasets.

## Untether AI

TORONTO, ON (REMOTE)

### Software Developer

Sept '20 – Dec '20

- Contributed to a customer-facing Python library to quantize and optimize TensorFlow computation graphs, towards compiling models for custom hardware.
- Designed and implemented Non-Max Suppression for quantized values using only integer operations, eliminating a CPU bottleneck and allowing object detection pipelines to run 10x faster on-chip.
- Experimented with different quantization schemes to improve object detection performance of an SSD-ResNet-34 model by 5%.
- Implemented a lookup table layer to represent arbitrary non-linear functions in a quantized space, allowing the Python library to support dozens of additional model architectures.

## Huawei

MARKHAM, ON

### LiDAR Perception Researcher

Jan '20 – Apr '20

- Implemented key modules from 12 different research papers in PyTorch, summarizing state-of-the-art techniques and enabling further research.
- Analysed the SemanticKITTI dataset to produce optimal class loss weights, boosting mIoU by 2%.
- Wrote a data loader to spatially align sequential LiDAR scans for temporal pipelines, based on IMU data, enabling the research of multi-scan LiDAR segmentation pipelines.

*Please refer to my [Linkedin profile](#) for a complete list of work experiences.*

---

## Skills

**Topics:** Self-Supervised Learning, Computer Vision, Speech Processing, Natural Language Processing

**Languages:** Python, C++, R, C, LaTeX, Java, JavaScript

**Frameworks:** PyTorch, TensorFlow, NumPy, Pandas, OpenCV, ROS, Gradio

**Tools:** Git, Docker, Conda, Bazel, CARLA, Linux, TensorRT