

# Salar Hosseini

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## Education

### M.Sc. in Computer Science, University of Toronto

Sept. 2021 – Jan. 2023

Research Areas: Deep Learning and Computer Vision, Advised by Prof. Florian Shkurti

CGPA: 4.00/4.00

- Coursework: Neural Network Training Dynamics, Probabilistic Learning, ML for Mathematical Optimization

### B.A.Sc. in Engineering Science (Robotics), University of Toronto

Sept. 2016 – May 2021

Graduation with High Honours, Artificial Intelligence Minor

CGPA: 3.96/4.00

- Coursework: Deep Learning, Machine Learning, Robot Perception & Planning, Algorithms & Data Structures

## Technical Skills

**Programming Languages:** Python, C++, C, Java, MATLAB, Bash, Latex, Verilog

**Libraries & Tools:** PyTorch, NumPy, JAX, OpenCV, scikit-learn, SciPy, pandas, Jupyter, Bash, Git, Docker, Slurm, AWS

## Professional Experience

### Machine Learning Research Intern | Samsung AI Center Toronto

Jan. 2023 – Present

Multimodal Situational Awareness Lab

- Developed a sampling scheme in **PyTorch** for increasing the throughput of **spatiotemporal vision transformers** pretrained using masked autoencoders while achieving competitive action recognition accuracy.
- Implemented sampling visualizations by using TensorBoard during pretraining and finetuning on GPU clusters.

### Machine Learning Researcher | University of Toronto

May 2020 – Jan. 2023

Robot Vision & Learning (RVL) Lab

- Proposed a state-of-the-art method for **self-supervised** video representation learning (+15.4% top-1 recall on UCF101 video retrieval) using **PyTorch** by iteratively clustering and contrasting embeddings from a 3D CNN.
- Published [\[oral paper\]](#) in CVPR 2022 (top 5% of ~8000 submissions) and **presented to hundreds** of attendees.
- Generated **adversarial driving scenarios** by adding perturbations using differentiable rendering simulators.

### Software Engineering Intern | Intel Corporation

May 2019 – May 2020

High Level Design Compiler Team

- Researched and implemented a latency-optimized **sorting algorithm** in C++ for processing large data sets.
- Increased average throughput of HLS algorithms by 10% by optimizing latency parameterization using **C++**.
- Developed a GUI with Qt to showcase live FPGA acceleration of a flagship design; presented to ~40 engineers.

### Research Assistant | University of Toronto

Jan. 2019 – Apr. 2019

Virtual Reality Robotics Lab, Mapping and Localization for a Quadrotor Drone

- Integrated the ORB-SLAM2 API to generate **point clouds** from a quadrotor drone's monocular image data.
- Implemented DBSCAN **unsupervised clustering** on point cloud data to identify objects in the mapped scene.

## Extracurricular and Personal Projects

### Neurotech - University of Toronto | Quadrotor Drone Vision Team

Oct. 2019 – Apr. 2020

- Developed a projectile tracker by using **Python (OpenCV)** for colour thresholding and depth estimation.
- Simulated the dynamics of a quadcopter by evolving the system state equations using MATLAB.

### aUToronto Self-Driving Car | Object Detection Team

Aug. 2018 – Apr. 2019

- Created a ROS framework to interface visual inputs, CNN inference, and bounding box visualization.
- Implemented FPGA **inference acceleration** for the SSD300 neural network using the OpenVINO API in **C++**.

## Awards

**Ontario Graduate Scholarship** – Merit-based award supporting master's degree

July 2021

**Vector Scholarship in A.I.** – Awarded to ~80 students in Ontario for master's studies in A.I.

May 2021

**Eng. Sci. Award of Excellence** – Awarded to ~25 students in Eng. Sci. for academic achievement

Mar. 2021

**NSERC Undergraduate Research Award** – Computer Science research grant for project at RVL Lab

May 2020