

# Salar Hosseini

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## Education

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

Sept. 2021 – Jan. 2023 (Exp.)

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

## Professional Experience

### Machine Learning Researcher | University of Toronto

May 2020 – Present

Robot Vision & Learning (RVL) Lab

- Proposed and implemented a state-of-the-art method for **self-supervised** video representation learning using **PyTorch** by iteratively clustering and contrasting embeddings from a 3D CNN; published in CVPR 2022 [paper].
- Generated **adversarial driving scenarios** by adding perturbations using differentiable rendering simulators; paper submission forthcoming at *Computer Vision and Pattern Recognition Conference (CVPR) 2023*.

### 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.
- Performed **unsupervised clustering** on point cloud data to distinguish objects in the mapped scene.

### Undergraduate Researcher | University of Toronto

May 2018 – Aug. 2018

Modelics Lab, Accelerated Modeling of 3D Integrated Circuits, in Collaboration with AMD

- Accelerated an electromagnetic solver by 3x by researching and adapting a 2D surface **partitioning algorithm** in C++ to 3D mesh models of integrated circuits.
- Reduced pre-meshing processing time by 10x by optimizing **C++** functions using the Gmsh API.

## 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++**.

## Technical Skills

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

**Libraries & Tools:** PyTorch, NumPy, JAX, OpenCV, scikit-learn, SciPy, Pandas, Jupyter, Linux, ROS, Git, Docker, Slurm

## 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