

# Salar Hosseini

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## Education

**M.Sc. in Computer Science, University of Toronto** Sept. 2021 – Dec. 2022 (Exp.)  
*Machine Learning and Computer Vision, Supervised by Prof. Florian Shkurti* CGPA: 4.00/4.00

- Thesis: Adversarial self-driving scenario generation using neural radiance fields
- Coursework: neural net training dynamics, probabilistic learning, ML for mathematical optimization

**B.A.Sc. in Engineering Science, University of Toronto** Sept. 2016 – May 2021  
*Robotics Major, Artificial Intelligence Minor, Supervised by Prof. Florian Shkurti* CGPA: 3.96/4.00

- Thesis: Self-supervised learning with iterative clustering for human action videos
- Coursework: deep learning, robot perception, mathematics for robotics, planning and control

## Professional Experience

**Machine Learning Researcher | University of Toronto** May 2020 – Aug. 2021  
*Robot Vision & Learning Lab*

- Designed a **self-supervised** similarity learning framework using **PyTorch** for identifying videos with similar human actions by iteratively clustering and contrasting embeddings from a 3D convolutional network.
- **Surpassed** the state-of-the-art (self-supervised) top-1 retrieval accuracy on the UCF101 dataset.

**Software Engineering Intern | Intel Corporation** May 2019 – May 2020  
*High Level Design Compiler Team*

- Researched and implemented a FPGA-optimized sorting **algorithm in C++** for processing large data sets.
- Increased average throughput of HLS designs by 10% by optimizing latency parameterization using **C++**.
- Developed and presented (to ≈40 engineers) a GUI showcasing live FPGA acceleration of a flagship design.

**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.
- Implemented a **graphical user interface** for visualizing 3D mesh models and electromagnetic fields.

## Extracurricular Projects

**aUToronto Self-Driving Car Team (Object Detection Division)** Aug. 2018 – Apr. 2019

- Created a **ROS** framework for the CNN detection and visualization of objects in self-driving images.
- Accelerated FPGA-inference for the SSD300 **object detection network** using the OpenVINO API (in **C++**).

## Skills

**Languages** – Python, C/C++, Java, MATLAB, Bash, Latex, Verilog

**Libraries** – PyTorch, NumPy, OpenCV, scikit-learn, SciPy, ROS, Pandas, Jupyter, Qt, SYCL

**Development Tools** – Linux/Unix, Git, Docker, Slurm, Perforce, Makefile, CMake, Android Studio, Quartus

## 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** – Awarded for research aptitude in computer science May 2020

**NSERC Undergraduate Research Award** – Awarded for research aptitude in engineering May 2018