SINCLAIR HUDSON

3rd Year Computer Science, University of Waterloo, Graduating May 2023

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LANGUAGES
Python, C++, C, LaTeX, Java, Javascript

FRAMEWORKS
PyTorch, TensorFlow, NumPy, ROS, OpenCV

TOOLS
Git, CARLA, VIM, GCP, Docker, Linux, AWS

SOFT SKILLS
Curious and Innovative
Resourceful and Efficient

EXPERIENCE

Software Developer, Untether.AI
Sep 2020 - Dec 2020 (Full-time)

- Built a customer-facing **Python** API to optimize, format and **quantize TensorFlow** neural network graphs.
- Designed and implemented Non-Max Suppression for quantized values using only integer operations, allowing Single-Shot Detector pipelines to be run on-chip.
- Implemented a lookup table class to represent arbitrary non-linear functions in a quantized space.
- Experimented with different quantization schemes to improve the **mAP of an SSD-ResNet-34 by 5%**.

LiDAR Perception Researcher, Huawei
Jan 2020 - Apr 2020 (Full-time)

- Managed a compute server with 8 GPUs, using **Docker** to continuously run and document deep learning experiments over a 4-month period.
- Built DBLiDARNet and focal loss from scratch in **PyTorch** to use in **semantic segmentation** experiments.
- Wrote a summary paper on current LiDAR point cloud segmentation techniques, **summarizing 12 papers**.
- Analysed the **SemanticKITTI** dataset to produce optimal class loss weights, increasing **mIoU by 2%**.
- Wrote a data loader to spatially align sequential LiDAR scans for temporal pipelines, based on IMU data.

Full Stack Developer, Wawanesa Insurance
May '19 - Aug '19 (Full-time)

- Conceptualized and created proof-of-concept projects, **presenting prototypes weekly**.
- Created a system that used **sentiment analysis** to determine Twitter's opinion of the company using **AWS**.
- Build a system that used a **TensorFlow BERT Transformer** to find and display Instagram posts relating to an insurance claim.
- Built a mobile app in **React Native** for both iOS and Android using accelerometer and GPS data to analyse user driving habits.

Perception Technical Lead, Watonomous Design Team
May 2019 - Present (Part-time)

- Trained a **PyTorch EfficientNet**-based image segmentation network, with the objective of roadline detection.
- Led small groups of core members on certain perception objectives in two week development cycles, using **Jira and Confluence**.
- Trained **TensorFlow YOLOv3** model to detect location and state of traffic lights, enabling the self-driving car to obey traffic light highway safety laws.

PERSONAL PROJECTS

CANSOFCOM: RADAR return drone classification
Jan 2021

- Used a convolutional neural network to classify 5 different commercial drones based on a **Fourier transform** of their noisy RADAR return signal.
- Came 1st place in the Hack The North 2020++ CANSOFCOM Drone ML challenge.

VM: A VIM clone implemented in C++
Dec 2019

- Designed and implemented an **MVC** architecture using design patterns and **SOLID principles**.
- Implemented **56 unique VIM commands**, including macros and unbounded undos.