

Sinclair Hudson University of Toronto MSc of Applied Computing

sinclair.hudson@mail.utoronto.ca • +1 (519) 694-0104 • sinclairhudson.com • [GitHub: SinclairHudson](https://github.com/SinclairHudson)

Education

University of Toronto

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

- 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, autonomous vehicles, and machine learning.
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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

Cruise

SAN FRANCISCO, CA

Model Deployment Platform Engineer

Sept '22 – Dec '22

- Developed debugging tools to assist in 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 baseline model while using 70% less memory.
- Presented a 30-minute research overview to the organization, summarizing research findings of the whole term.
- 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.
- Trained XGBoost and SVR systems to model the relationship between environmental conditions and yield for an agriculture client, giving the client insight into the impact of environmental conditions on their yield.
- Implemented the core functionality of Dataset Distillation using the autograd package, to pursue research in low-data machine learning contexts.
- Implemented VAE, VQ-VAE, and VQ-VAE-2 from scratch in PyTorch, demonstrating the effectiveness of autoencoders as anomaly detectors 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.
- Designed and implemented Non-Max Suppression for quantized values using only integer operations, allowing object detection pipelines to run 10x faster on-chip.
- Experimented with different quantization schemes to improve the mAP of an SSD-ResNet-34 by 5%.
- Implemented a lookup table class to represent arbitrary non-linear functions in a quantized space, allowing the python library to support any activation function.

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

Skills

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

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

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