DAYOU MAO

4B Computer Science Student @ University of Waterloo

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GitHub LinkedIn WebSite

PUBLICATIONS

- Aboutalebi, H., Mao, D., Xu, C., & Wong, A. (2023). DeepfakeArt Challenge: A Benchmark Dataset for Generative AI Art Forgery and Data Poisoning Detection. *arXiv preprint arXiv:2306.01272*.
- Bauschke, H. H., Mao, D., & Moursi, W. M. (2022). How to project onto the intersection of a closed affine subspace and a hyperplane. *arXiv preprint arXiv:2206.11373*.

TECHNICAL SKILLS

- Languages/Tools: **Python**, **C++**, **CUDA**, **Vulkan**, **SQL** | Git, Docker, Kubernetes.
- ML Libraries: **NumPy**, **PyTorch**, **TensorFlow**, **PIL**, scikit-learn, OpenCV, Matplotlib, Caffe, SciPy.

WORK/RESEARCH EXPERIENCES

Vision and Image Processing Lab Jan 2023 – Present · 6 mos
Research Assistant - Computer Vision *Waterloo, ON, Canada*

- Literature review of **explainable AI** for **autonomous vehicles** and reported to Transport Canada.
- Create benchmark dataset on **generative AI** art forgery and data poisoning detection.
- Supervising a small team of undergrads on research on **image retrieval** algorithms.
- Ongoing research on **multi-task learning** for robotics grasping.

NVIDIA Corporation Jan 2022 – Apr 2022 · 4 mos
Computer Vision Engineer - Autonomous Vehicles *Santa Clara, CA, United States (Remote)*

- Implemented new **data pipeline** to create clean datasets for model development and comparison.
- Enriched **training pipeline** by implementing and testing more learning rate schedules, sampling mechanisms, and refactoring code for neural network implementation.
- Proposed improvements on training config and **stabilized the training process** and **reduced training time** from ∼20h to ∼3h. Significantly sped up model development.
- **Improved F_1-score** of a traffic light classification model by **∼1%** on **end-to-end KPI** test sets by hyper-parameter searching from 1000+ experiments.
- Debugged memory, latency, and **performance tests** for multiple classifier nodes on different platforms.

MIND Technology, Inc. May 2021 – Aug 2021 · 4 mos
Machine Learning Engineer - Object Detection *The Woodlands, TX, United States (Remote)*

- Generated **synthetic data** of lobster pots, human bodies, and mines for **model pretraining**.
- Achieved **near 1.0 confidence** on synthetic data after fine-tuning the network topology and weights from a **RetinaNet** trained on MS COCO dataset.
- Researched on deployment onto Google Edge TPU with **TensorFlow Lite** and NVIDIA Jetson Nano with **TensorRT**, and profiled the usages.

CoreAVI May 2023 – Present · 2 mos
Machine Learning Software Engineer - GPU Programming *Waterloo, ON, Canada*

- Developing our neural networks **GPU inference engine** for safety critical applications in avionics.

University of Waterloo May 2022 – Aug 2022 · 4 mos
Research Assistant - Optimization *Waterloo, ON, Canada*

- We proposed a novel formula for projection operations with theoretical proof of correctness and empirical results demonstrating the acceleration it brings to the class of alternating projection algorithms.

EDUCATION

University of Waterloo, Canada Sep 2019 – Present · 3 yrs 10 mos

- Triple major in **Computer Science**, **Statistics**, and **Optimization** with faculty average ∼93%.