DAYOU MAO

4B Computer Science Student @ University of Waterloo

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 GitHub LinkedIn WebSite

TECHNICAL SKILLS

- Languages/Tools: **Python**, **C++**, SQL, R | Git, Docker, CUDA, AWS, Apache Kafka, Kubernetes.
- AI/ML Libraries: **NumPy**, **TensorFlow**, **PyTorch**, scikit-learn, OpenCV, Matplotlib, Caffe, SciPy, pandas.

WORK EXPERIENCES

NVIDIA Corporation — January 2022 − April 2022 · 4 mos
Computer Vision Engineer - Autonomous Vehicles — *Santa Clara, CA, United States (Remote)*

- Defined a new **data input pipeline** and enabled relevant teams to create clean datasets for model development and comparison between different versions.
- **Software implementation** of cyclical learning rate schedules, over/undersampling mechanisms, and **refactored code** for model definition to enable more robust and flexible fine-tuning process.
- Improved F_1-score of a traffic light classification model by around **1%** on **end-to-end KPI** test sets by fine-tuning from thousands of experiments.
- **Stabilized the training process** and **reduced training time** from around 20h to around 3h with improved training methodologies.
- Fixed memory, latency, and **performance tests** for multiple classifier nodes on different platforms and generated **performance reports** for the AV infra team.

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

- Generated **synthetic data** of lobster pots for **pretraining** the **RetinaNet** model.
- **Transferred** a RetinaNet **object detection** model from the COCO 2017 dataset to sonar signals of underwater lobster pots.
- Fine-tuned the feature pyramid architecture and achieved **near 1.0 confidence** on synthetic data.
- Deployed the model onto **Google Edge TPU** using TensorFlow Lite and **NVIDIA Jetson Nano** using TensorRT, and profiled the usages.

RESEARCH EXPERIENCES

University of Waterloo — May 2022 − August 2022 · 4 mos
Undergraduate Research Assistant — *Waterloo, ON, Canada*

- Preprint: Bauschke, Heinz H., Dayou Mao, and Walaa M. Moursi. "How to project onto the intersection of a closed affine subspace and a hyperplane." *arXiv preprint arXiv:2206.11373* (2022).
- Proposed and proved a **closed form formula** for **projection operations** onto the intersection of a closed affine subspace and a hyperplane in the context of Hilbert spaces.
- Implemented **numerical experiments** to verify the correctness of our results and empirically demonstrated that alternating projection algorithms with the new formula **converge faster**.

PROJECTS

MedTechResolve Student Design Team — March 2022 - Present

- Leading the **computer vision R&D** team on various biomedical engineering projects.

Machine Learning Knowledge Base — January 2021 - Present

- Production-level implementation of data input, model training, and model evaluation pipelines for **classification**, **object detection**, and **semantic segmentation** tasks.
- Collection of papers and notes in ML with a focus on **CNN**, **Transformer**, and **GAN** architectures.

EDUCATION

University of Waterloo, Canada — September 2019 - Present

- Triple major in **Computer Science**, **Statistics**, and **Optimization** with faculty average 93.46%.