# DAYOU MAO

4B Computer Science Student @ University of Waterloo

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GitHub LinkedIn WebSite

## TECHNICAL SKILLS

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

## WORK EXPERIENCES

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

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

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

- Generated **synthetic data** of lobster pots to **pretrain** 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*

- Proposed and proved a **closed form formula** for **projection** onto intersection of a closed affine subspace and a hyperplane in a Hilbert space.
- Implemented numerical experiments to verify the correctness of our results and empirically showed that **alternating projection methods** using the new formula **converges faster**.
- 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).

## PROJECTS

**MedTechResolve Student Design Team** March 2022 - Present
*Software Engineering Team Lead* *Waterloo, ON, Canada*

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

**Computer Vision Knowledge Base** January 2021 - Present

- Developing a code base for computer vision, including common **CNN**, **Transformer**, and **GAN** architectures and **classification**, **object detection**, and **segmentation** frameworks in TensorFlow.

## EDUCATION

**University of Waterloo, Canada** September 2019 - Present

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