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Avery Chiu

MECHATRONICS ENGINEERING STUDENT

EDUCATION

University of Waterloo *Waterloo, Ontario, Sept 2019 - Apr 2024*

Candidate for Bachelor of Applied Science in Mechatronics Engineering
Artifical Intelligence Option, GPA: **3.97** (93.5% cumulative average)
Important Courses:

- Experimental Measurement & Statistical Analysis
- Introduction to Computer Structures & Real-Time Systems
- Linear Algebra for Engineering
- Algorithms and Data Structures
- Numerical Methods
- Advanced Calculus

SKILLS

Python, C/C++, Numpy, Pandas, Matplotlib, SciKit-Learn, PyTorch, TensorFlow, Keras, OpenCV, SQL, MATLAB, ROS, AWS, Git, Docker

WORK EXPERIENCE

Display Engineering Intern *Palo Alto, California, Sept 2021 - Dec 2021*
Tesla

- Developed the calibration sequence for a 3-axis display testing robot which includes performing coordinate transformations to align the robot with the display, and using potential field navigation with gradient descent to locate points on a 2D plane.
- Designed a GUI with **PyQt5** to interface with the display testing robot, utilizing multi-threading to handle events, visualize the robot's movement, and display test results using **Matplotlib**.

Computer Vision Undergraduate Research Assistant *Waterloo, Ontario, Apr 2021 - Sept 2021*
University of Waterloo Vision and Image Processing Lab

- Implemented Mask-RCNN, Faster-RCNN, and RetinaNET with **Detectron2** and **PyTorch** in **AWS Sagemaker** to detect Northern Leaf Blight disease in maize, achieving an accuracy of 94.6% in detecting diseased plants.
- Created a **Python** script to compute the average precision and recall from each image and output a PDF with a side-by-side comparison of the ground truth versus the predicted bounding boxes using **OpenCV**.

Firmware Developer Intern
Ford Motor Company

- Implemented package versioning and signing, using **C**, for secure over-the-air firmware updates to the bootloader of the telematics control unit for Ford vehicles.
- Developed **Bash** scripts to manage access to bootloader partitions and file systems for different processes, ensuring secure access to data within the partitions.

Automotive R&D Intern *Waterloo, Ontario, May 2020 - Aug 2020*
Geotab

- Analyzed vehicle data from customers using **Google BigQuery (SQL)** and prepared dashboards to display visualizations, such as geographic heatmaps, with **Python** using libraries such as **Matplotlib**, **NumPy**, and **Pandas**.

DESIGN TEAMS

Co-Founder *Waterloo, Ontario, July 2021 - Present*
WATOLINK

- Co-founded a BCI (brain-computer interface) student design team, with 40+ members, to compete in the NeuroTechX competition and to develop a device used to communicate with others online using brain signals.
- Developed scripts to sample and collect data from EEG headsets for data preprocessing before applying deep learning models, including **CCA** and **CNN**, for classification of the signals.

Telemetry/CAN Interface Manager *Waterloo, Ontario, Dec 2020 - Present*
WATonomous

- Led a team of 4 people to develop the telemetry system and CAN interface to monitor and control a self-driving Chevrolet Bolt EV for the SAE Autodrive Challenge.
- Designed the software architecture to facilitate communication between the **ROS** network and the **CAN** network, allowing for messages to be packed and sent to the vehicle for autonomous control.
- Refactored **Python** code to follow **OOP** principles, improving the readability and reusability of the software.