Mark Do

Portfolio Website | mdo@uwaterloo.com| GitHub | LinkedIn

Technical Skills

Languages: Python, C++, CSS, HTML, JavaScript, Git, SQL, Arduino, MATLAB

Libraries: TensorFlow, PyTorch, Scikit-learn, Pandas, NumPy, Matplotlib, PySerial, OpenCV, Flask

Design & Manufacturing: Siemens NX, SolidWorks, AutoCAD, 3D-Printing, Laser-cutting, Soldering, Oscilloscope

Work Experience

Production Technician | *Data Analysis, Scikit Learn, Pandas, NumPy, Process Optimization* Jan. 2023 – Apr. 2023

Olymel S.E.C

- Conducted studies on ingredients, machinery, production defects & yields to create 7 optimization reports
- Aggregated & preprocessed ~200,000 cumulative datapoints using Pandas, NumPy, and Scikit-learn
- Developed application which automatically performs statistical analysis and linear regression on input datasets. Application outputs a sorted list of most significant trends in the data, speeding up 1-on-1 feature comparisons by 50%
- Visualized results using histograms, 3D scatterplots, and heatmaps with Matplotlib for recommendation reports

Projects

Emotional Cardiography (ECG) | *OpenCV, TensorFlow, Flask, Python, C++, JavaScript,* GitHub

- Developed and trained Convolutional Neural Network using Keras-TensorFlow, achieving an accuracy of over 70% in recognizing 5 emotions. Integrated with Flask, the model transfers the real-time emotion predictions to a NodeJS backend
- Iteratively improved model performance using error analysis, image augmentation, and skip connections inspired by ResNet
- Designed and programmed Arduino C/C++ model to detect users' heartbeat, using serial communications to transfer data

Jesture Bot (Hand Motion Controlled RC Car) | *C++, Arduino, OpenCV* GitHub

- Built a Bluetooth RC Car that works as a portable speaker, controlled by hand gestures over webcam
- Used OpenCV to detect hand gestures, left-hand controls car movement and right-hand for speaker volume
- Communicated with Arduino Due microcontroller using PySerial and an HC-05 Bluetooth module
- Used a logic level converter to drop 5V voltage from microcontroller to 3.3V for Bluetooth and motor controller

Experience

Satellite Thermals Team Member | *SolidWorks, Siemens NX, Thermal Analysis* Sept. 2022 – Jan. 2023

UWOrbital

- Simulated CubeSat satellite models in Siemens NX to investigate chassis' thermal behavior in while in different stages of orbit
- Satellite chassis modeled in SolidWorks, exported to and modified in Siemens NX for thermal simulations
- Developed 5 simulation models with surface-to-surface calculations for max flux and min flux orbit cases
- Researched thermal & optical properties for Aluminum alloys, FR4, Copper and PVC for use in-place of default material values

Computer Vision Team Member | *PyTorch, GitHub, NumPy* May 2023 - Present

Waterloo Aerial Robotics Group

- Developed object orientated CNN model with PyTorch on the CIFAR-10 dataset with 70% validation set accuracy
- Utilized dropout, batch normalization, and data augmentation techniques to reduce overfitting

Education

University of Waterloo Sep. 2022 – May 2027

Candidate for Bachelor of Mechanical Engineering

- Dean's Honors List: Fall 2022 - 4.0 GPA
- President's Scholarship of Distinction: Awarded for a 95%+ admission average