Mark Do

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

Education

University of Waterloo   Sep. 2022 – May 2027

Candidate for Bachelor of Mechatronics Engineering

- Dean's Honors List: 2022 & 2023, 4.0 Cumulative GPA, President's Scholarship of Distinction

Technical Skills

Languages: Scala, Python, C/C++, JavaScript, Java, Git, SQL, Arduino, MATLAB, CSS, HTML, Dart

Libraries & Frameworks: TensorFlow, PyTorch, OpenCV, Scikit-learn, TestNG, Selenium

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

Work Experience

Quality Engineering Analyst | *Test Automation, TestNG, Appium, Gradle, BrowserStack, Java*   Sep. 2023 – Dec. 2023

Definity Financial

- Enhanced regression suite with over 120 test cases for Sonnet's app on iOS & Android, increasing test suite reliability.
- Developed a new data driven TestNG module with OkHttp to automate test uploads & execution via requests to BrowserStack's API endpoints. Reduced test execution time by 20% and eliminated need for manual uploads or triggers.
- Created entirely new technical documentation and a style guide for testing suite to enhance team efficiency, ensure standardized test procedures and significantly reduce onboarding time for new quality engineers.

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

Olymel S.E.C

- Aggregated, preprocessed, and analyzed ~50,000 cumulative datapoints using Python Pandas and Scikit-learn libraries.
- Developed application to perform statistical analysis on input datasets using dimension reduction and linear regression.
- Conducted studies on ingredients, machinery, production defects & yields to create 7 optimization reports.
- Visualized results using histograms, 3D scatterplots, and heatmaps with Matplotlib and Excel to convey trends effectively.

Open-source Experience

Autonomy Developer | *Open-source, Scikit-learn, Linux, NVIDIA Jetson, Multi-processing*   April. 2022 – Present

WARG is a design team focused on the unmanned aerial vehicle industry, which develops open-source autonomous flight software.

- Developed a clustering algorithm for WARG's perception-decision-controls system to predict drone landing locations.
- Utilized a Variational Gaussian mixture model to group detected landing pad locations and find the centers of data clusters.
- Integrated the module into producer-consumer multi-processing model, ensuring correct functionality through unit tests.
- Performed hardware-in-the-loop testing for landing pad detection module with NVIDIA Jetson Ubuntu OS on a flying drone.
- Created post-mortem test reports after drone flights and usage documentation for cluster module.

Projects

Articus Maximus - Sketching Robot | *C, PID Controller, Image Processing, OpenCV*   GitHub

- Designed & manufactured a 2-axis gantry sketching robot which controls a pen to draw images on paper from digital file input.
- Created an image processing pipeline in Python to pre-process, detect edges, and find contours from .JPG or .PNG file types.
- Implemented translational-variant Hu Moments and a recursive Douglas-Peucker algorithm to remove redundant contours.
- Programmed and tuned a PID controller in C with anti-windup and a 1D motion profile to draw lines accurate within 2 degrees.

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.