

# Mark Do

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## Education

**University of Waterloo** - Candidate for **Bachelor of Mechatronics**

2022 - 2027

- 4.0 CGPA | 96% term average | 2X Dean's Honors List

## Technical Skills

**Languages:** Python, C++, Java, Scala, ROS2, Arduino, MATLAB

**Libraries & Frameworks:** TensorFlow, PyTorch, Ultralytics, OpenCV, Scikit-learn, Docker

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

## Work Experience

**QE Automation Analyst** | *Java, Docker, CI/CD Pipelines, TestNG, Appium, Gradle*

Sep. 2023 – Dec. 2023

*Definity Financial*

- Overhauled Java test suite with > 120 test cases for Sonnet's mobile app, reducing false positive bug detections by > 90%.
- Developed a new automated module to dynamically create test batches & execute them in parallel to reduce testing time.
- Created a new CI pipeline by Dockerizing the automated test suite & Allure reporter for deployment to Bitbucket pipelines.
- Leveraged 6 automatic pipeline triggers to eliminate need for manual test startup & reporting, saving > 12 hours weekly.
- Authored new HLDs for entire test suite, automated functionality, CI pipeline & wrote onboarding docs for new interns.

**Production Technician** | *Data Analysis, , Scikit-learn, Pandas, NumPy*

Jan. 2023 – Apr. 2023

*Olymel S.E.C*

- Performed dimensionality reduction, regression & analysis of production data in Python to increase total production yields.
- Collected data on raw ingredients & machinery settings daily to ensure quality standards and for future investigations.
- Created a transformation pipeline to turn production data into .CSV for storage & into Pandas dataframes during analysis.
- Analyzed > 3 years of raw ingredients data from databases & written records to author 3 recommendation reports.

## Related Experience

**Autonomy Developer** | *Open-source, Scikit-learn, Linux, NVIDIA Jetson, Clustering algorithms*

Apr. 2022 – Present

*WARG is a design team 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 & find the centroids of pad 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 model with Jetson on a flying drone & wrote post-mortems.

## 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 detect edges & find drawable contours from .JPG or .PNG file types.
- Implemented translational-variant Hu Moments & a recursive Douglas-Peucker algorithm to remove redundant contours.
- Programmed and tuned a PID controller in C with anti-windup & a 1D motion profile to draw lines accurate within 2 degrees.

**Emotional Cardiography (ECG)** | *OpenCV, TensorFlow, Flask, Python*

[GitHub](#)

- Developed and trained a CNN using TensorFlow, achieving an accuracy of over 75% in classifying 5 emotions from facial views.
- Iteratively improved model performance by using ResNet skip connection blocks, error analysis & input augmentation methods.