Julian Pettit

(519) 635-9415 | julian.s.pettit@gmail.com | jpettit.ca

SKILLS & QUALIFICATIONS

- **Languages:** Python, C/C++, Java, Kotlin, Bash, JavaScript, SQL, MATLAB
- **Technologies:** OpenCV, Git, Docker, TensorFlow, Keras, PyTorch, Hadoop, Kafka, Qt, NUnit, React
- **Experience:** Computer Vision, Application Development, Machine Learning, Data Analysis, Cloud, IOT, Deployment

WORK EXPERIENCE

Software Developer, *AdHawk Microsystems* *Jan. 2019 – Aug. 2019*

- Developed an eye tracking gaze calibration system accurate to 1° using pose estimation of ArUco markers in OpenCV. Created a Python application to perform frame transformation, UDP data transmission, and logging.
- Redesigned the core product public API to support command acknowledgements and multiple pipelines, meeting key investor requirements. Tested and supported the changes throughout multiple release cycles.
- Created data visualization applications to improve analysis and logging of product data streams using Qt.
- Performed a sensor study to select an appropriate camera for use on the eye tracking headset. Collected data and performed distortion calibration and parameter adjustment tests in OpenCV and analyzed data in MATLAB.

Software Engineering Consultant, *IBM* *May 2018 – Aug. 2018*

- Developed computer vision algorithms to process images and perform feature replacement using OpenCV and OpenGL. Categorized replacement types into 3 categories based on feature detection using TensorFlow.
- Created an image recognition and tagging application to filter end user submissions using TensorFlow and Keras. Trained the filter using positive and negative samples and the COCO dataset to categorize images into 8 classes.
- Produced an IOT warehouse inventory management application in Java using Bluetooth Low Energy RSSI beacons. Piped data to the application using Kafka and processed location analytics using Hadoop.

Product Development Engineering Intern, *UTEX Scientific Instruments* *Sep. 2017 – Dec. 2017*

- Developed low-level nondestructive testing software on an ARM processor for ultrasonic modules and motion controllers using C. Integrated controls hardware for multi-axial scanning.
- Simulated ultrasonic scans and automated 25% of the nondestructive scanning process with C# and Python scripts.

Test Software Developer, *Virtek Vision International* *Jan. 2017 – Apr. 2017*

- Validated targeting speed improvements to industrial laser projectors by automating test processes using NUnit and increasing overall coverage of integration tests by 150%.

Application Developer, *Innovasium Digital* *May 2016 – Aug. 2016*

- Created customized web applications to improve workflow and communication for finance companies using the React and Redux JavaScript libraries. Tested applications with JUnit.

PROJECT EXPERIENCE

Passenger Detection System, *University of Waterloo Alternative Fuels Team* *Sep. 2019 – Dec. 2019*

- Created and trained a classifier to detect the presence of children and pets in parked vehicles with 95% accuracy using an Intel RealSense camera in an autonomous vehicle for the EcoCAR Mobility Challenge.
- Deployed a live camera feed detection algorithm on a Jetson TX2 module using OpenCV, TensorFlow, and Keras.
- Developed an alert system to warn the driver of forgotten passengers via SMS upon exiting the vehicle.

EDUCATION

University of Waterloo, *BASc Mechatronics Engineering* *Sep. 2015 - Apr. 2020*

- University of Waterloo President's Scholarship
- Kendo Club President; Alternative Fuels Team Member; Engineering Society Director; Class Representative