Julian Pettit

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SKILLS & QUALIFICATIONS

- **Languages:** Python, C#, C, JavaScript, Bash, SQL, MATLAB
- **Technologies:** Git, Linux, Docker, Github Actions, Terraform, NUnit, OpenCV, TensorFlow, PyTorch, React
- **Experience:** Infrastructure, Continuous Integration, Computer Vision, Machine Learning, Data Analysis, Deployment

WORK EXPERIENCE

Software Developer, *D2L* *May 2020 – Present*

- Created a Web Application Firewall to block and record unwanted traffic to a public API gateway. Defined rule groups and match sets in Terraform and successfully deployed the firewall to the production AWS console.
- Developed a validation program to allow clients to preprocess data uploads, reducing server load and cutting batch processing time by 50%.
- Regularly contributed feature changes and bugfixes to the codebase with a focus on structure and performance.

Software Developer, *AdHawk Microsystems* *January 2019 – August 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 – August 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.

Product Development Engineering Intern, *UTEX Scientific Instruments* *September 2017 – December 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.

Test Software Developer, *Virtek Vision International* *January 2017 – April 2017*

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

PROJECT EXPERIENCE

Passenger Detection System, *University of Waterloo Alternative Fuels Team* *September 2019 – December 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, *Bachelor of Applied Science, Mechatronics Engineering* *Sep. 2015 - Apr. 2020*

- Graduation with Distinction (3.70 GPA); Management Science Option; President's Scholarship
- Kendo Club President; Alternative Fuels Team Member; Engineering Society Director; Class Representative