

# Julian Pettit

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## WORK EXPERIENCE

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**Human-Computer Interaction Software Developer, AdHawk Microsystems** Jan. 2019 – Aug. 2019

- Developed an eye tracking gaze calibration system accurate to 1° using pose estimation of ArUco markers and frame transformations with the OpenCV library in Python.
- Redesigned the core product public API to support command acknowledgement and multiple pipelines to meet key investor requirements. Tested and supported the changes through multiple release cycles.
- Created frontend applications to support visualization of data streams using PyQtGraph in Python.
- Developed a success indication system to improve the ease of use of MEMS testing boards.

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

- Developed computer vision algorithms for 3 types of image feature replacement using the OpenCV library in C++.
- Created an image recognition and tagging application with a trained classifier using the Tensorflow library in Python.
- Trained a filter for user-submitted content using over 10000 samples to categorize images into 8 classes.
- Produced an IOT warehouse inventory management application in Java using Bluetooth Low Energy RSSI beacons.

**Product Development Engineering Student, 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

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**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 the internal driver drowsiness camera in an SAE level 2 autonomous vehicle for the EcoCAR Mobility Challenge.
- Developed an alert system to warn the driver of forgotten passengers via SMS upon exiting the vehicle.

## EDUCATION

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**University of Waterloo** Sep. 2015 - Apr. 2020

BASc Mechatronics Engineering

Waterloo, ON

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

## SKILLS & INTERESTS

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- **Programming Languages:** Python; C/C++; JavaScript; Bash; SQL
- **Skills:** O.O.P.; Computer Vision; Machine Learning; Algorithms; Data Analytics; Cloud Computing; IOT
- **Interests:** Bicycling; Cooking; Martial Arts; Camping; Literature; Languages (German, French, English)