# Chris Gravel

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## EDUCATION

BASc Mechatronics Engineering with AI Option, *University of Waterloo* — 2014 - 2019

## SKILLS

| | |
|---|---|
| Software Languages | Python, C, C++, Bash, SQL, Matlab, Javascript |
| Software Tools | Microcontrollers, Linux, ROS, Git, OpenCV |

## EXPERIENCE

**Software Engineer (Nest)**, *Google LLC* — Sept 2019 - Present

- Scoped infrastructure work for supporting test automation for new hardware products. Took ownership of design, and implementation while leading and providing guidance for junior SWEs. Infrastructure supported 20+ hardware devices, 1000+ automation tests, and impacts millions of users. (Python)
- Ideated and implemented a novel solution that applies statistical tools for detecting software regressions which reduced engineering effort to root cause latency issues from 4 hours to 1 min. (Python, SQL, Jenkins, Two sample T-test, DataStudio)
- Used optimization and ML techniques to create a flicker detection algorithm with a 96% recall rate. (Python, numpy, scipy, skimage)
- Worked with cross functional teams to design and implement infrastructure that analyzed power measurements and generated software regression signals. Test became the most productive test at Nest with over 50 actionable signals that drove product decisions. (Python, numpy)

**Perception Team Engineer**, *Avidbots Corp.* — May 2018 - Aug 2018

- Developed mathematical model for optimal sensor layout for cliff detection using 1D sensors. (Python, Geometry, Numerical Methods)
- Automated collection and labelling of vision data using localization information and camera feeds on the robot. (OpenCV, Python, C++)

**IoT & AI Developer**, *IBM* — Sept 2017 - Dec 2017

- Created real-time object recognition solution with 95% accuracy for POC contract using supervised learning on a FasterRCNN network. (Python, FasterRCNN)

**Robotics Software Developer**, *Avidbots Corp.* — Jan 2017 - April 2017

- Developed numerical model in C++ and Matlab for simulating trajectory to determine traversal time. (C++, Python, ROS, Matlab, Numerical Methods)
- Improved performance by 10% by applying low pass filters to trajectory coordinates using OpenCV. (C++, ROS, OpenCV)
- Wrote unit tests for a robotics system on the ROS platform in C++ using the Google test framework. (C++, ROS)

## ENGINEERING PROJECTS

Optimization of Vehicle Suspension using Enhanced Hillclimbing — Python, Matlab — 2018
- Created a novel search algorithm that outperforms other state-of-the-art search algorithms in the field.

gst - (G)it (St)atus Tool — Python — 2018
- Commandline tool for improving my own Git workflow. Compatible with Mac and Linux.

Asteroids Game built on ARM Cortex-M microcontroller — C — 2016
- Re-created the game of Asteroids on an ARM Cortex-M microcontroller with RTOS.
- Used semaphores and mutexes to enable synchronous multitasking operations.
- Created Physics engine to model the original game physics.

## ACHIEVEMENTS

- Runner-up in an international IBM internal coding competition (CodeBlue 2017).
- Received multiple awards (4 spot bonuses, 2 peer bonuses) at Google due to impact of contributions.
- Received Python readability status at Google which provides the authority to approve Python changes.