

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

Senior Software Engineer (Nest), *Google LLC*

Sept 2019 - Present

- Lead a team of 5 engineers to design and build infrastructure for supporting Google's Matter launch. The infra we built supports creating dynamic topologies of real devices with a complex configuration matrix of more than 100 params and served as a release gate for millions of devices. ([Python](#))
- Designed and implemented pipelines for continuous delivery and continuous integration testing. Integrated pipelines across multiple ecosystems (Google internal, Github, Gerrit, Jenkins). ([Python](#), [Bash](#), [Google Cloud build](#), [Docker](#), [Jenkins](#))
- Scoped infrastructure work for supporting new hardware in our test automation. 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 involving latency which reduced engineering effort to root cause 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](#))
- Mentored engineers to help them advance in their career and adapt to the professional environment. Arranged quarterly team gatherings for 15+ people. Took advice from those willing to teach me. ([Soft skills](#))

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](#))

Junior Hardware Designer, *Imagine Communications*

May 2016 - Aug 2016

- Wrote VHDL code to optimize FPGA implementation of an Ethernet receiver which reduced read clock cycles by 8x. ([VHDL](#))
- Designed and implemented a FPGA component which captures and records ethernet packets for debugging. ([VHDL](#))
- Automated hardware testing using electrical instrumentation and Python APIs. ([Python](#))

Mechatronics Prototyper, *Engineering Ideas Clinic*

Sept 2015 - Dec 2015

- Created schematics, layouts, and soldered PCBs to create proof of concept prototypes
- Salvaged parts from E-waste bins for use in prototypes to save over \$1,000 in resources
- Designed and built an AM Radio to be used as a teaching aid for 4th year electrical students.

Web App Developer, *Computer Science Computing Facility*

Jan 2015 - April 2015

- Improved performance of a core web app by 2,000%, reducing page load time by 13 seconds.
- Indexed database by cardinality to improve lookup time in relational database.

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.
- Git Status Tool (gst) — 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 allows me to approve Python changes for their style.