Douglas Huang

Mechatronics Engineering | University of Waterloo

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Skills

- Proficient in **C/C++** development and **Python** scripting.
- Experience with **ARM Cortex** (STM32 and Kinetis) and **Arduino** microcontrollers, and lab test equipment.
- Knowledge of 2D and 3D modelling with **AutoCAD** and **Solidworks**.
- Familiar with web development using **HTML**, **CSS**, **JavaScript**, **JQuery**, and **Flask**.
- Development tools: **Git**, **CVS**, **Bash/UNIX**, **IAR Embedded Workbench**, and **TrueSTUDIO**.

Experience

Sep. 2015 – Dec. 2015 — **Embedded Software Developer**, Imagine Communications Canada

- Developed firmware and application in C for PCI-Express card with Freescale ARM microcontroller and MQX real-time operating system.
- Designed and implemented a mailbox system and protocol between Windows driver and board using SPI communication for transmission of network configuration data.
- Created and integrated an abstraction layer for driver initialization using lookup tables, significantly reducing code size and time complexity of the application.

Jan. 2015 – May 2015 — **Bioinformatics Software Developer**, Agriculture and Agri-Food Canada

- Developed and maintained data analysis pipelines using Python, Perl, and Bash shell scripting, for DNA sequence annotation and genome assemblies of wheat and flax.
- Designed and developed a genome assembly file merger following MapReduce programming paradigm to combine 53,000 DNA scaffolds from 403 genotypes.
- Implemented GNU Parallel to parallelize microRNA annotation pipeline, decreasing processing time by 40%, and coded new modules for improved data analysis using R.

Oct. 2014 – Present — **Electrical Team Programmer and Designer**, Waterloo Hybrid SAE Team

- Developed engine data parser in C to transform raw data from hybrid race car vehicle control unit into analyzable information, using Arduino for serial communication.
- Assisted in PCB development with Altium Designer, board assembly, and hardware testing using multimeters and oscilloscopes.
- Reviewed vehicle electrical schematics with team lead and debugged C firmware code.

Projects

Jan. 2015 — **CodePaper**, UofT Hacks

- Created a graphical programming language using Python that interprets user-drawn flow diagrams for functional programming.
- Implemented OpenCV computer vision library for image processing and used a binary tree structure to identify and store nodes and edges.
- Developed web application using Flask for photo submission and online processing.

Sep. 2014 — **TurnIT Bike Indicator Light System**, Hack the North

- Engineered a Bluetooth motion-activated bicycle indicator light system using Arduino and Pebble smart-watch.
- Programmed watch accelerometer to detect arm gestures and control corresponding lights connected to Arduino via Bluetooth module.
- Created a five – segment LED arrow array embedded into a 3-D printed electronics housing designed using Solidworks.

Education

2014 – 2019 — **Bachelor of Applied Science in Mechatronics Engineering**, University of Waterloo
GPA: 3.9/4.0