

AVERY CHIU



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MECHATRONICS ENGINEERING STUDENT WITH KEEN INTEREST IN FIRMWARE/HARDWARE

PROGRAMMING

- Python
- C/C++
- SQL
- Java
- LabVIEW
- Git/Github/Gitlab
- Linux
- Google Big Query
- Visual Studio Code
- Eclipse
- STM32Cube IDE

HARDWARE

- Altium Designer
- SMD Soldering
- Digital Multimeter
- Oscilloscope
- Power Analyzer
- ARM
- STM32
- ESP32
- Raspberry Pi
- Arduino

MECHANICAL

- SOLIDWORKS
- AutoCAD

PROJECT MANAGEMENT

- Confluence
- Jira

EDUCATION

University of Waterloo

Candidate for BASc
Mechatronics Engineering
(Sept 2019 - Present)
GPA: **3.95**

HOBBIES

- Double bassist for the Toronto Symphony Youth Orchestra 2018/2019 season
- Young Hercules Weightlifting Competition silver medal in the 77kg weight category

WORK EXPERIENCE

Automotive R&D Intern

Geotab (May 2020 - Aug 2020)

- Designed a PCB used for testing keyless vehicle technology with **Altium Designer** and created **Gerber** files for manufacturing
- Debugged a PCB for a solar tracking device with a **multimeter** and calculated the energy consumption of the modem, GPS, and MCU on it with a **power analyzer**
- Created a miniature vehicle to demonstrate keyless functionality such as being able to unlock doors with a phone through **Bluetooth** or an **NFC** reader
- Queried vehicle and sales data using **Google Big Query** and prepared dashboards to display visualizations with **Python** using **Matplotlib**, **Pandas**, and **NumPy**

Firmware Developer

Midnight Sun Solar Car Team (Sept 2019 - Present)

- Set up the **telemetry** system with **Python** to read **CAN** messages, store data in **MongoDB**, and send these messages to the **cloud** using **MQTT** through **WiFi** and **LTE**
- Created **Python** scripts to generate DBC files using **protocol buffers** to store **CAN** message definitions
- Programmed firmware in **C** for an **STM32** to process events from the control stalk and send **CAN** messages to toggle the output for the horn, lights, turn signal and cruise control
- Developed driver for an **LTC6811** to retrieve readings from 32 thermistors connected to a multiplexer using **SPI** for the battery management system (**BMS**) of the solar car
- Improved **communication** skills by assisting in recruitment and preparing documents to teach new members about **GPIO**, **ADC**, **I2C**, **SPI**, **CAN**, and how to read **datasheets**

PROJECTS

STM32F103C8 Drivers

(Aug 2020)

- Wrote bare-metal **GPIO**, **SPI**, **UART**, and **I2C** drivers for an **STM32F103C8** with an **ARM Cortex-M3** processor in **C**
- Configured **peripheral clocks**, **registers**, and **interrupts** according to the **memory map** and **vector table** from the datasheets

Hand Sanitizing Watch

Hack the 6ix (Aug 2020)

- Developed a prototype for an **IoT** hand sanitizing watch with an **ESP32** that uses **BLE** to connect to a phone
- Used **SPI** to communicate with a **MCP 6050 accelerometer/gyroscope** to detect certain wrist movements and dispense hand sanitizer accordingly

Bike Telematics Device

MakeUofT Hackathon (Feb 2020)

- Created a bike telematics device with Python on a Raspberry Pi
- Used a **TELUS CAT-M1** cellular shield to send **SMS** messages to users to warn when their bike is being stolen and provide **GPS** coordinates to the location of their bike
- Won the award for best use of the TELUS CAT-M1 IOT Network