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Avery Chiu

MECHATRONICS ENGINEERING STUDENT

PROGRAMMING

- C/C++
- Python
- SQL
- Java
- LabVIEW
- Git
- Linux
- Google BigQuery
- STM32Cube IDE

HARDWARE

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

EDUCATION

University of Waterloo
Candidate for BASc
Mechatronics Engineering
(Sept 2019 - April 2024)
GPA: **3.95**
Important Courses:

- Data Structures and Algorithms
- Microprocessors and Digital Logic

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** and created the **schematic**, **PCB layout**, **BOM,** and **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
- Analyzed vehicle and sales data using **Google BigQuery** and prepared dashboards to display visualizations with **Python**

Firmware Developer

Midnight Sun Solar Car Team (Sept 2019 - Present)

- Designed 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 **protobufs** 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 an 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 them 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