Avery Chiu

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MECHATRONICS ENGINEERING STUDENT

PROGRAMMING

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

HARDWARE

- Altium Designer
- SMD Soldering
- Digital Multimeter
- Oscilloscope
- Power Analyzer

MECHANICAL

- SOLIDWORKS
- AutoCAD

PROJECT MANAGEMENT

- Confluence
- Jira

EDUCATION

University of Waterloo
Candidate for Bachelor of Applied Science, Mechatronics Engineering (Sept 2019 - Present)
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

Firmware Developer

Midnight Sun Solar Car Team (Sept 2019 - Present)

- Set up the **telemetry** system with **Python** to read **CAN** messages and store them in **MongoDB**
- 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 **leadership** skills by assisting in recruitment and preparing documents to teach new members about **GPIO**, **ADC**, **I2C**, **SPI**, **CAN**, and how to read **datasheets**.

Automotive R&D Intern

Geotab (May 2020 - Aug 2020)

- Designed, manufactured, and assembled a PCB used for testing keyless vehicle technology with **Altium Designer**
- 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**

PROJECTS

STM32F103C8 Drivers

(Aug 2020)

- Wrote **GPIO**, **SPI**, **UART**, and **I2C** drivers for an **STM32F103C8** with an **ARM Cortex-M3** processor in **C**

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

Self Feeding Catheter

McMaster CAD Designathon (Jan 2020)

- Developed a medical device to assist doctors with inserting catheters into patients that uses a **stepper motor** and **potentiometer** controlled by an **Arduino Uno** to carefully feed guide wire into the patient
- Created a 3D model of feeding device along with the housing for the spool using **SOLIDWORKS**

Robot in 3 Days

FIRST Robotics Competition (Jan 2020)

- Developed different modules, following **OOP** principles, that sends **PWM** signals to motors to control their speed and toggles the extension and retraction of pneumatic pistons

Automated Ferris Wheel

Ontario Skills Competition, Robotics and Control Systems (April 2019)

- Used LabVIEW to program and build an automated and safe mini-Ferris wheel that tracks the number of customers that board the ride and runs automatically once all the seats are filled