Ellie T. Xu

- Portfolio –

Summary of Skills

Mechanical

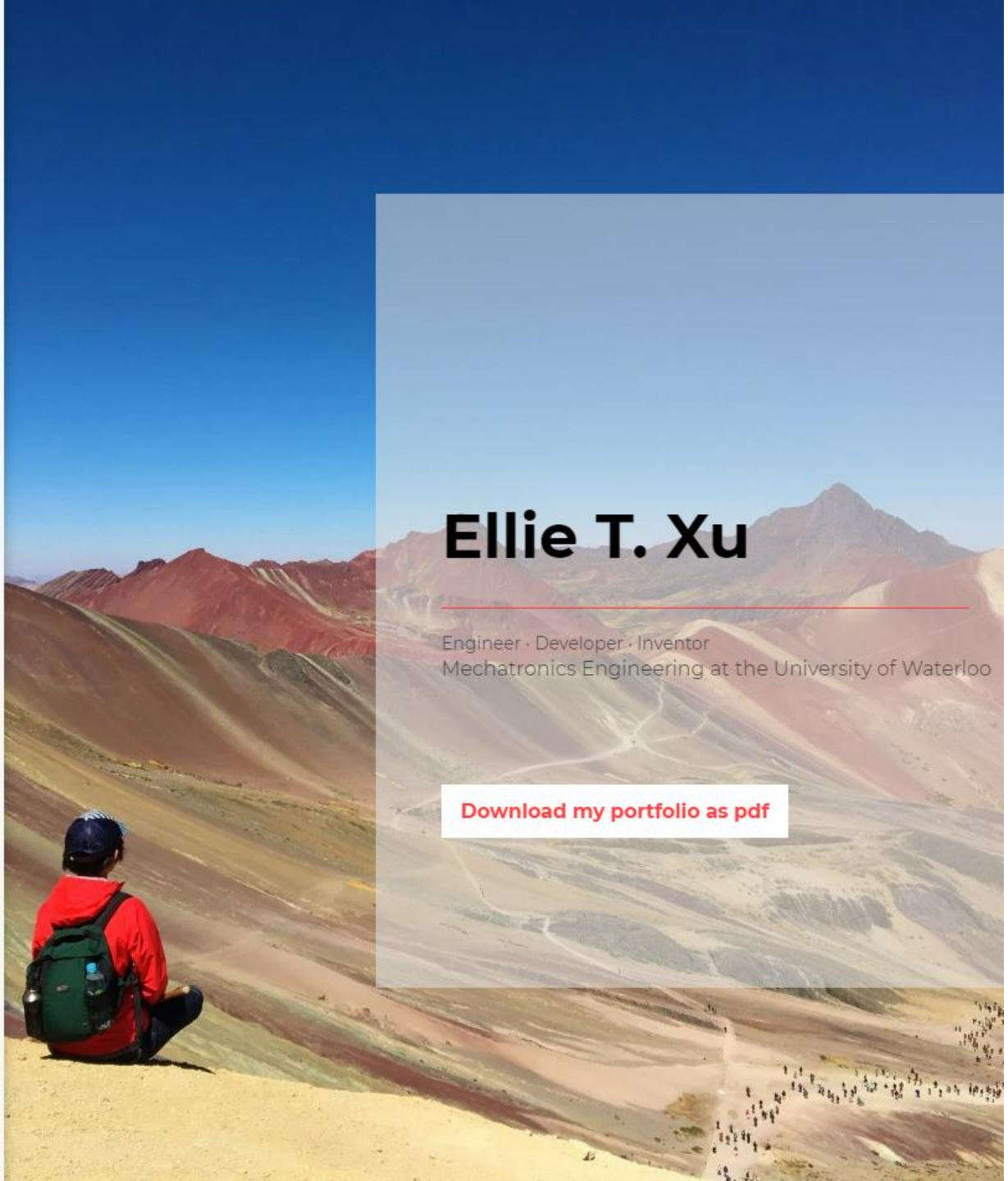
- SolidWorks
- Inventor
- AutoCAD
- GD&T
- 3D Printing
- Revit
- Shop tools: lathe, CNC, laser cutter

Software

- Python
- JavaScript
- Java
- C++
- Unity
- C#
- HTML/CSS
- Firebase
- Git
- Bash
- Visual Studio

Electrical

- Schematic layout design
- PCB layout design
- KiCAD
- Frizting
- AVR Microcontrollers
- Arduino
- Raspberry Pi
- Soldering
- Firmware development



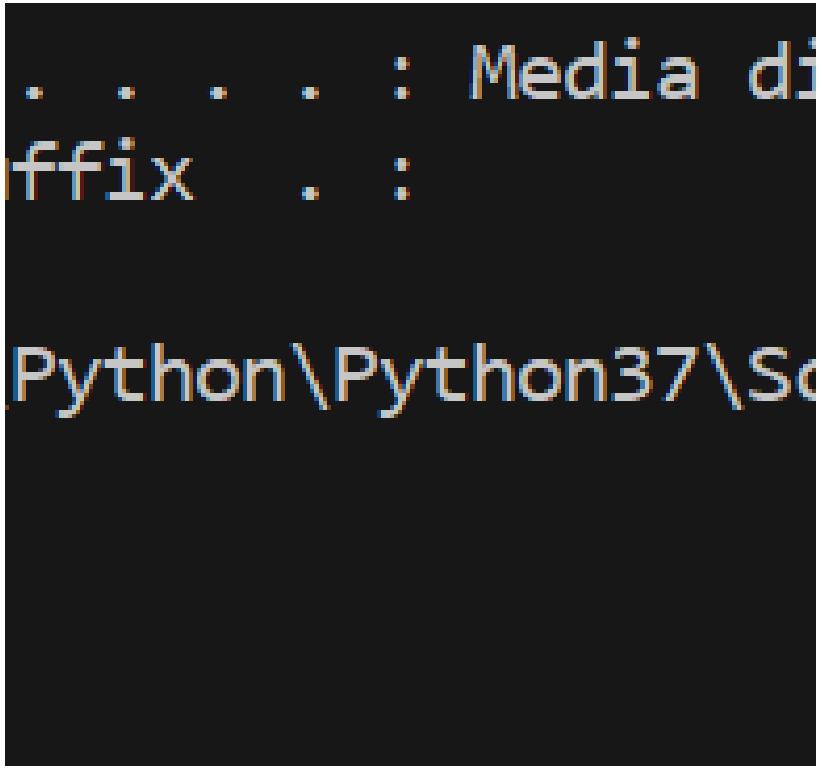
JavaScript, CSS, HTML

elliexu.com

2020

My personal website created with JavaScript, HTML and CSS

Check it out on desktop and mobile



Ontario
MINISTRY OF HEALTH

	A	B
1	Data Set 1	Data Set 2
2	205	262
3	262	291
4	261	698
5	291	193
6	961	961
7	799	924
8	956	956

Software Developer at the Ministry of Health

Python, Visual Basic

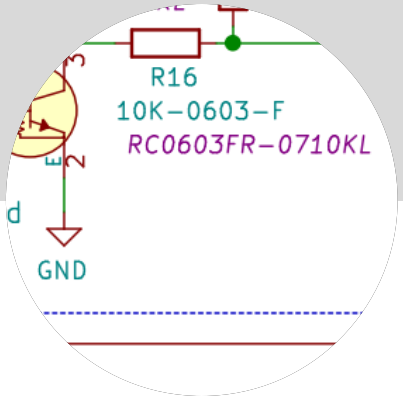
Sept. 2020 - Present

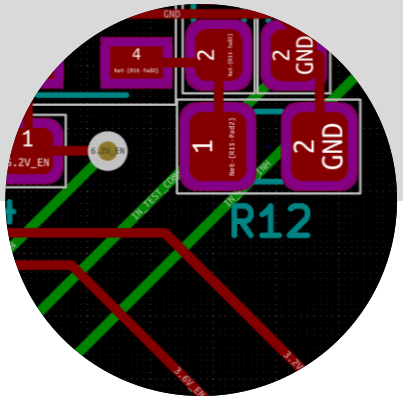
- Automated multiple official excel formatting standards in **Python** with Openpyxl and TKinter GUI.
- Researching 2-factor authentication for scripts located on SAS server with Microsoft Authenticator.

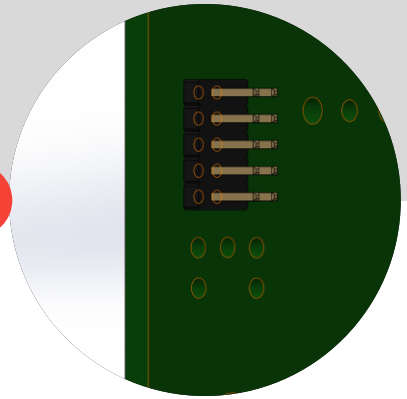
PCB & Schematic, Python, C++, SolidWorks

Hardware Engineer at AOMS Technologies

Jan. 2020 – Apr. 2020







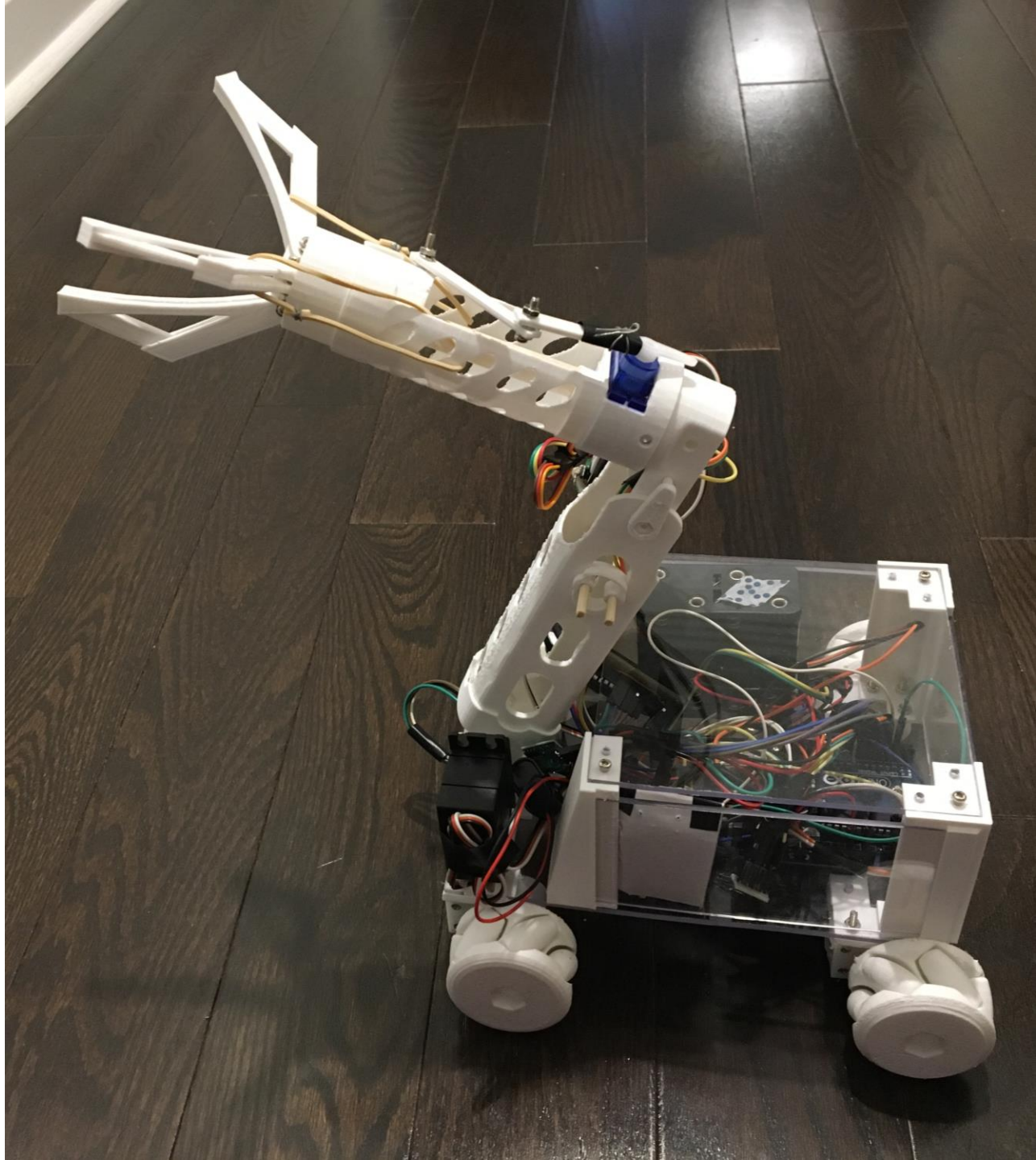
- Projects included LoRa GPS mapping device, non-intrusive current measurement sensor, lightning sensor, test jigs, and more.
- Wrote analysis\mapping **Python** program (e.g. Matplotlib, Rasterio, GeoPandas) for LoRaWAN-GPS mapper for product insights (e.g. gateways).
- Edited **C++** firmware and created **schematics & PCBs** in **KiCad** for LoRaWAN-GPS mapper with frequency bands for EU\USA.
- Designed 2 test jigs: maintained **C++** firmware for their **AVR microcontrollers**, created middle-man **Python** scripts between firmware and user, **KiCad schematics \& PCBs**, and **SolidWorks** models; involving UPDI, SPI, AVRDUDE, UART, ATtiny, and Atmel Ice and flashed firmware and error checked 100+ cards.
- Researched, prototyped on **Arduino**, and created **KiCad schematics & PCBs** for working CT sensor and lightning sensor.
- Used **Git** and **Agile** tools to collaborate with the team.
- Conducted experiments on humidity sensors, worked with potting, 3D printing, and product assembly.

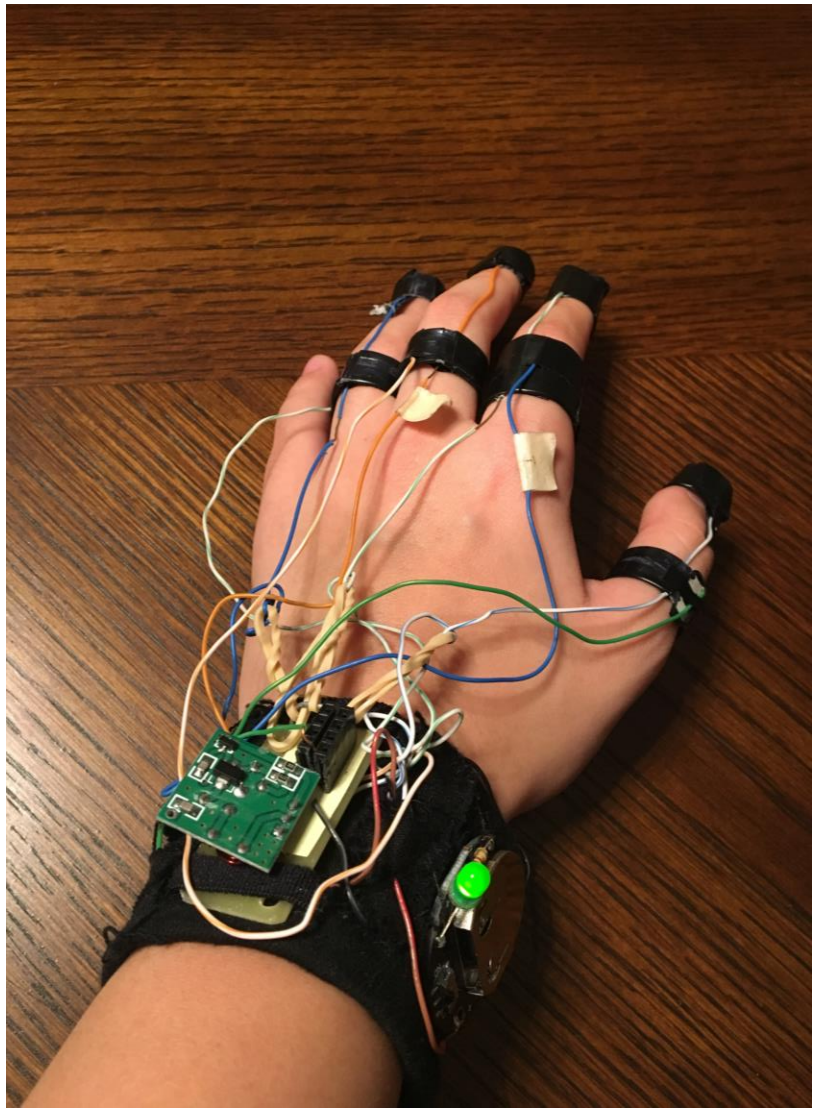
SolidWorks/Inventor, 3D printing,
Arduino, PCB & Schematic Design

CODIA

2019

- Built an **Arduino** based modulated robot with an alterable configuration designed to adapt to perform various tasks.
- User interface through an original and low-cost wireless hand-gesture controller.
- Designed to act as an artificial assistant.





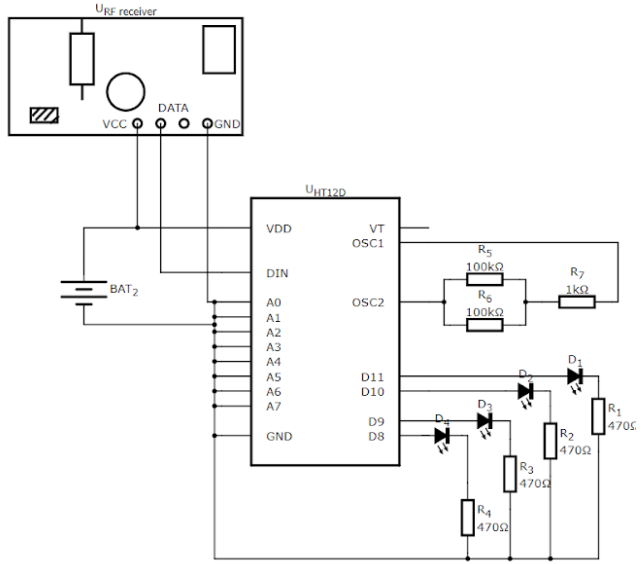
CODIA

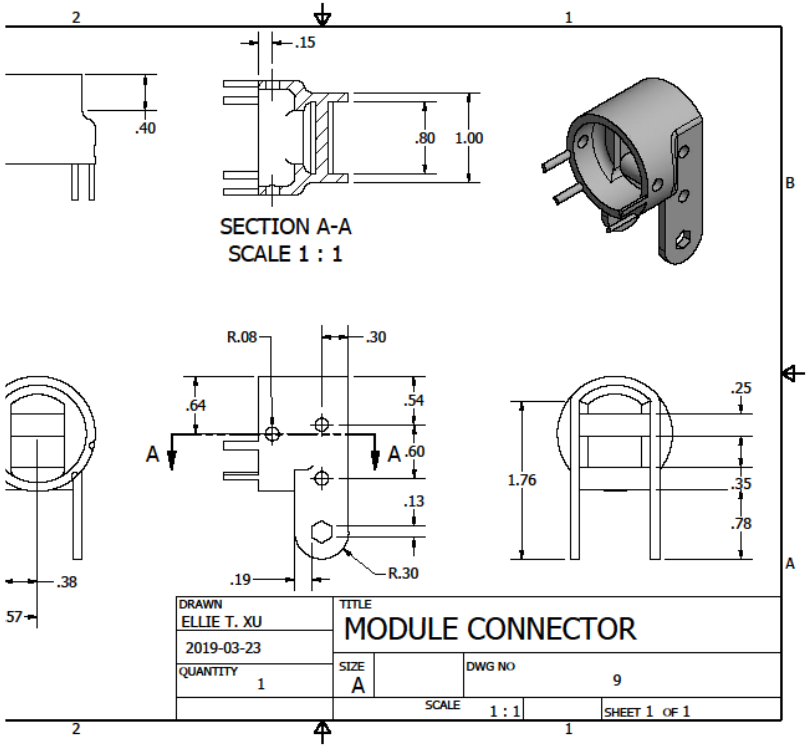
(continued)

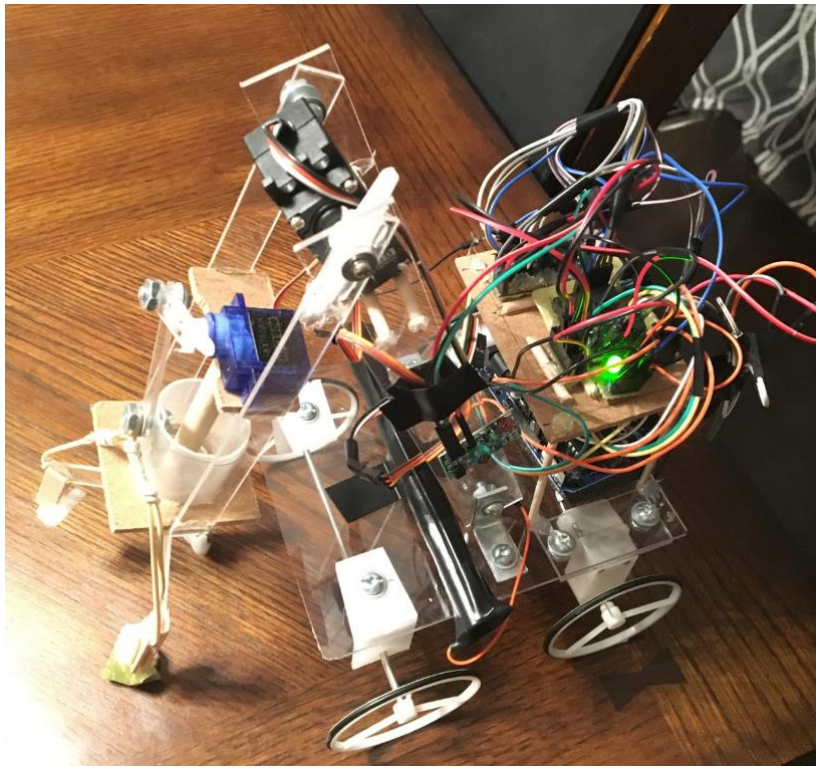
Developed an original low cost wireless hand-gesture controlled communication system using radio frequency.

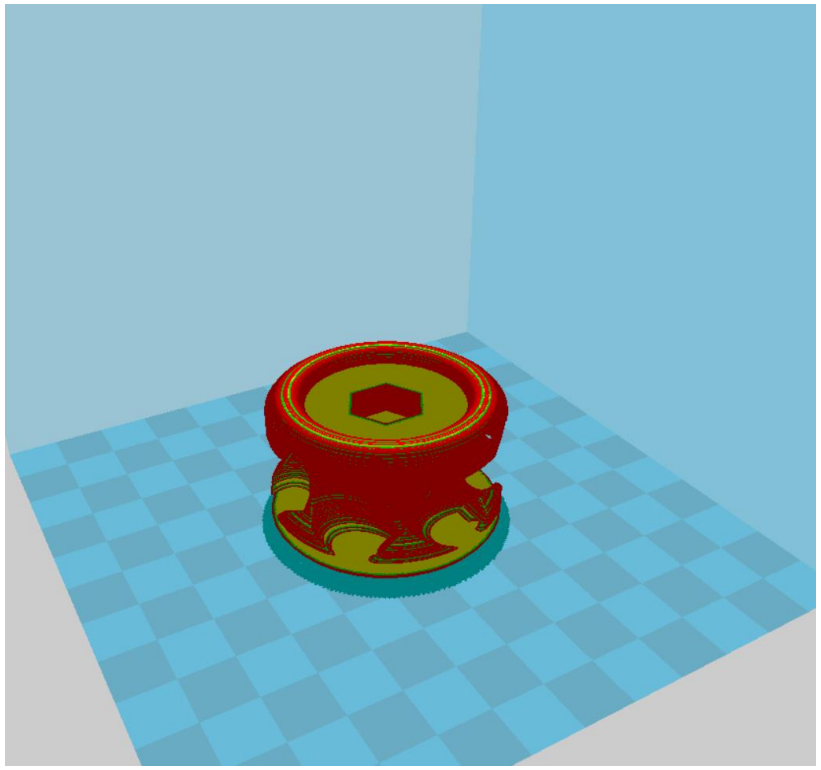
Designed, prototyped, and made all **schematics and PCBs** from drivers to automatic configuration recognition and soldered them.

- Prototyped them on breadboards first, then moved to PCB and soldered them.









Mechanical Design

Solidworks/Inventor

- Researched and 3D modelled mechanisms such as the chassis, electro-mechanical interfaces, and mecanum wheels on **Inventor**.
- Developed drawings to help the manufacturing process.

Prototype

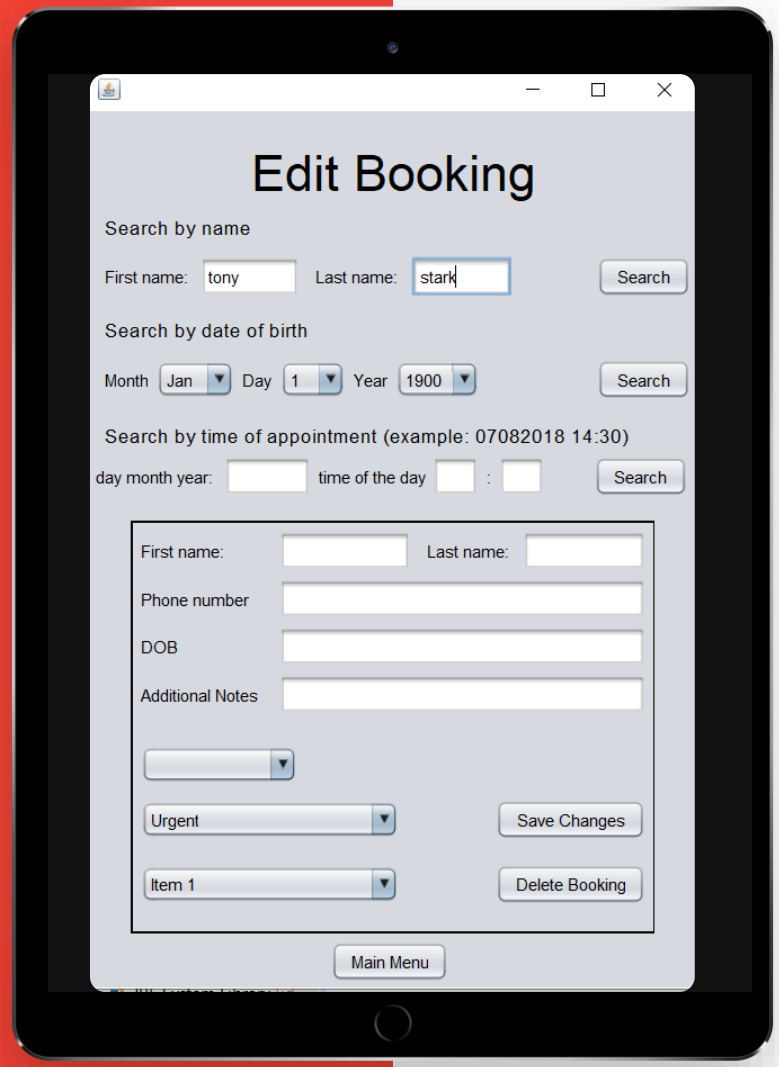
Shop Tools

- Prototyped designs with wood and acrylic models before 3D printing the final.

3D Printing

3D Printing.

- **3D printed** complex parts with PLA plastic to increase structural integrity, precision, and functionality.



Java

Booking Program

2018

- Initiated and programmed a patient booking software on **Java** as an alternative to paper bookings at my co-op placement.
- Integrated a GUI with JFrame and ensured multi-device access by creating an XML database.

AutoCAD, Inventor, Manufacturing,

Core Mechanical Engineer

FIRST Robotics team

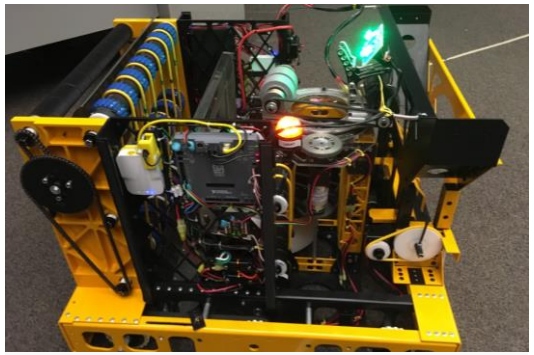
- Produced 2D, 3D, and sheet metal models on **AutoCAD & Inventor** along with drawings that applied GD&T principles.
- Performed virtual **stress simulations** on models before production using Inventor.
- Manufactured prototypes and mechanisms with the plasma cutter, CNC, lathe, and other tools.

Core Mechanical Engineer

FIRST Robotics

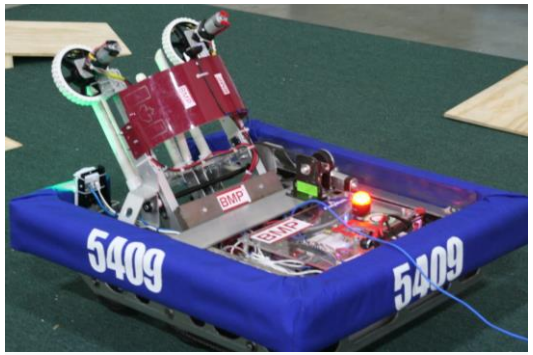
Power Up - 2018

Mechanism of focus: scissor Lift.



Steamworks - 2017

Mechanism of focus: climbing/intake mechanism.

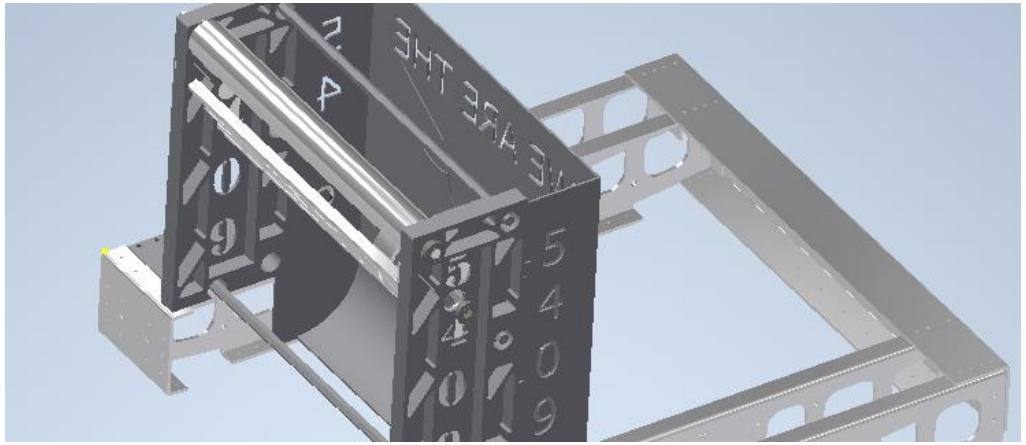


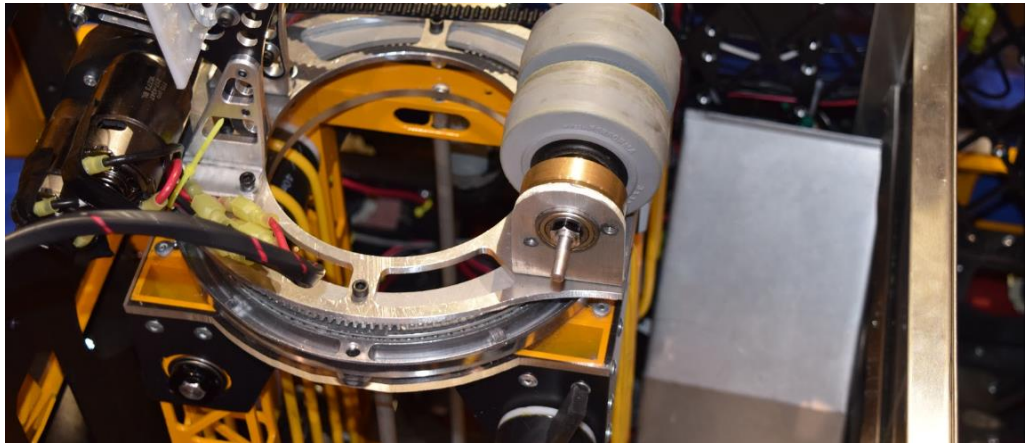
Stronghold - 2016

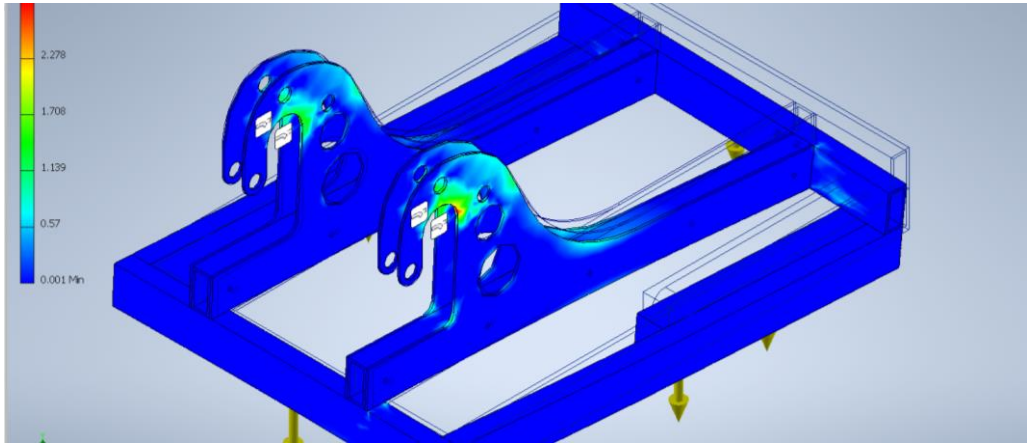
Mechanism of focus: non-electrical grappling hooks.

Core Mechanical Engineer

FIRST Robotics







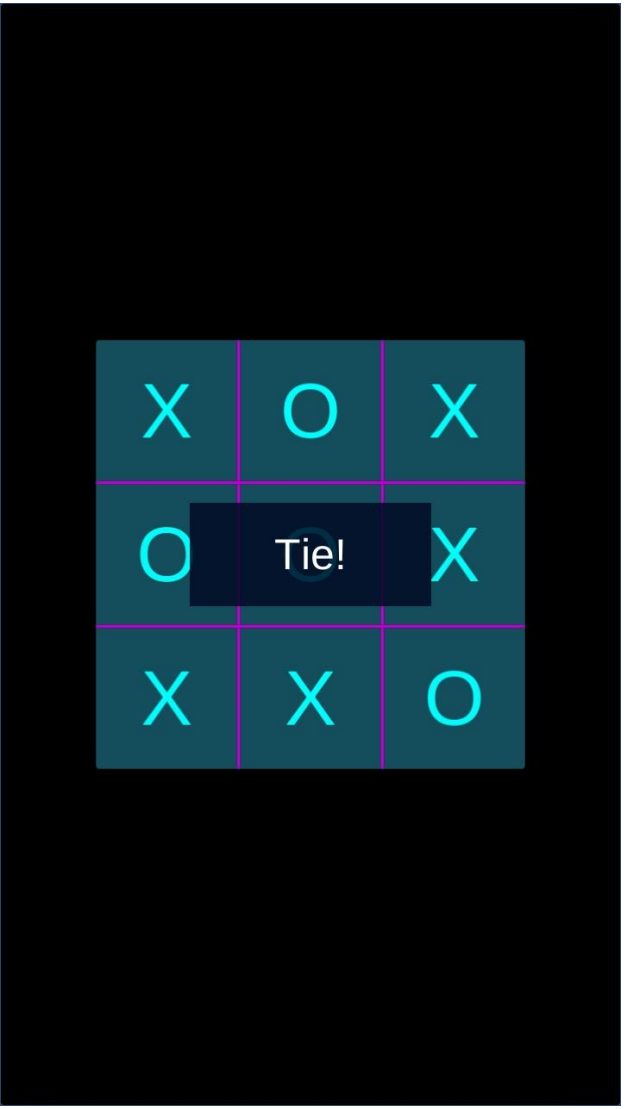
Java, C#, Unity, Git

CrowdMotions

- Smart Review Web Scraper

2019

- Created an **Android App (Unity)** that found the public's sentiment on any service by web scraping from many review sites.
- Wrote algorithms on **Java\C#** that learned sentiment values from preexisting data and used them to analyze new data.
- Used **Git** version control to collaborate with team.

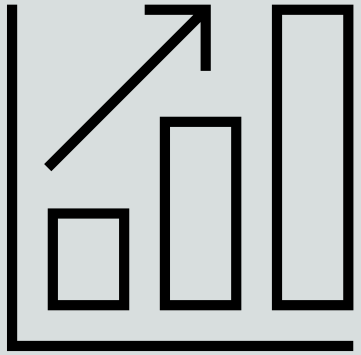


Games

Java, C#, Unity

- Created **Android Apps (Unity & C#)** from Tic Tac Toe to custom arcade games.

- Recreated the fun 2048 game as a .jar on **Java** that keeps track of high scores.



Python

Stock Analyzers

2020

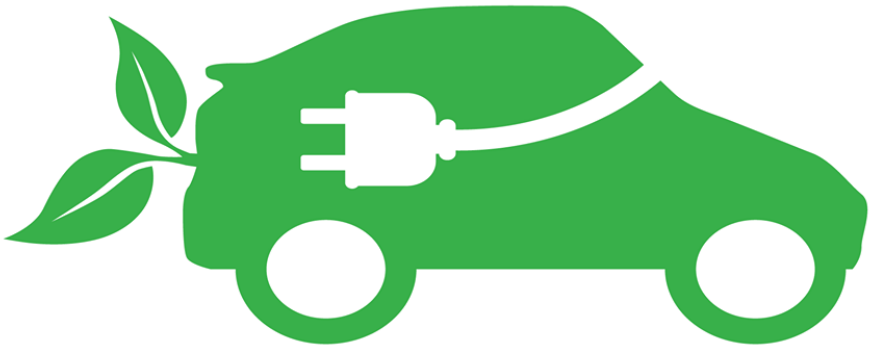
- Wrote **Python** (Numpy, Pandas) scripts that ran thousands of simulations under various algorithms to find the optimal approach to the stock market.
- Wrote another **Python** script that incorporates real time web scraped data from twitter to perform and integrate sentiment analysis.
- Could increase net worth by 250 times within 20 years.

Python, Arduino

Virtual Personal Shopping Assistant

2019

- Janet: a **voice-controlled** shopping assistant for customers that performed tasks from locating products to providing helpful suggestions.
- Carol: the other assistant that provided companies with projected customers trends that were obtained through **machine learning**.
- **Database**: connected to a database so the shopping assistants can be accessed from different devices.
- Incorporated hardware as a user guidance with **Arduino** and **3D modelling**, and **laser cutting**.



UWAFT

UNIVERSITY OF WATERLOO
ALTERNATIVE FUELS TEAM

Python

Software Developer:

Automated & Connected Systems

Oct. 2020 - Present

- Developed a dashboard to display sensor data using **Python** OOP (i.e. TKinter) and ROSpy.
- Collaborated with team using **Git** version control on bash and agile.

SolidWorks

Mechanical Engineer

Watlock

Sept. 2019 - Present

- Researched, modelled, and contributed to the airlock hatch door made to withstand Mars conditions on **SolidWorks**.
- Used **GrabCAD** to collaborate with the team.

Some Additional Projects

Thermoelectric 3-in-1

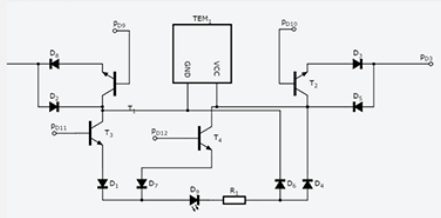
- A container that used the Peltier-Seebeck effect to act as a generator, cooler, or heater.
- Controllable over **Wi-Fi** and is **Arduino** based.

AR Navigation

- An **AR** based navigation **Android (Unity)** app that recognized key features to determine locations.
- Projected 3D navigation directions on the glasses.

Web ID

- **Arduino**, **HTML**
- Virtual wallet accessible over a web page.
- Dispenser drops items when virtual credits are spent.



Check out more of my projects and involvements:

elliexu.com