

Ella Yan

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📁 Technical Portfolio

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Education

University of British Columbia

09/2022 - 05/2027

BASc, Engineering Physics - Deans

Sessional Standing: Dean's Honour List

Skills

Electrical

Altium, LTSpice, Soldering Oscilloscope, PCB Design, FPGA

Software

Python, C/C++, Java, PyQT, Git, MATLAB, OpenCV, Linux

Mechanical

Onshape, Solidworks, 3D Printing, Machining, Laser Cutting

Work Experience

Data and Software Engineer

Richmond, BC

01/2024 - 04/2024

General Fusion

- Designed data analysis pipelines for high-precision calibration and characterization of plasma diagnostics in state-of-the-art fusion reactor
- Applied **Python**-based data analysis techniques using **Scipy** and **Matplotlib** to extract Compton edges used to calibrate neutron scintillator energy spectra
- Streamlined temperature sensor calibration using **Tkinter**, saving \$20k by eliminating pricy external software
- Developed multithreaded scripts to efficiently extract, process, and present key insights from a database of 20,000 plasma shot records, improving data clarity and usability.

Technical Experience

Sensors and Communications Co-Lead [🔗](#)

05/2024 - Present

UBC AeroDesign

- Leading a team of 9 members in the design and validation of an avionics sensor system involving IMUs, barometers, GNSS modules, and radio communication
- Designed an airspeed sensor **PCB** in **Altium** using an **STM32** microcontroller, and **CAN** for communication to provide real-time airspeed data to our main flight controller
- Handled schematic capture, component selection, layout, routing, BOM optimization and ordering
- Utilized **CAN**, **SPI**, **I2C**, **UART** to facilitate communication between sensors and microcontrollers
- Set up RTK on ZED-F9P GNSS modules, achieving 1.4 cm accuracy and 0.1 mm precision on positional data

Power and Controls Co-Lead [🔗](#)

04/2023 - 04/2024

UBC AeroDesign

- Directed a team of 8 members in the design and testing of aircraft propulsion, power distribution, and flight control systems as entries for the SAE AeroDesign competition
- Utilized **Altium Designer** and **LTSpice** to help design custom wiring hubs and power distribution boards, streamlining wiring layout and cutting our avionics setup time by 80%
- Selected shunt resistors and Hall effect sensors for power sensing circuits capable of handling up to 750 watts
- Coordinated meetings between avionics and mechanical teams, ensuring smooth integration

Autonomous "Cooking" Robot Competition [🔗](#)

06/2024 - 08/2024

UBC Engineering Physics

- Built two autonomous robots capable of collaborating to assemble toy burgers, successfully reaching semi-finals
- Soldered and tested **H-bridge** and reflectance sensor **PCBs**, using oscilloscopes for debugging
- Utilized LM2596 buck converters and **LM7805/LM7833 LDOs** to power sensors and actuators, calculating expected power losses and junction temperatures to ensure reliable performance
- Developed a real-time WiFi-based **GUI** for on-the-fly parameter tuning, increasing testing efficiency by 85%
- Used **C++** to implement motor driver and state machine firmware on **ESP32-S2** microcontrollers

Multistage Coil Gun [🔗](#)

01/2023 - 05/2023

- Built a multistage coil gun using **ESP32s**, 400V capacitors, and solenoids, able to fire projectiles at 17 m/s
- Selected **thyristors** for high voltage/current handling and used **optocouplers** to isolate voltage sections