Ella Yan

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Education

University of British Columbia — 09/2022 - Present
BASc, Engineering Physics
Sessional Standing: Dean's Honour List

Skills

Software	Electrical	Mechanical
Python, C/C++, Java, OpenCV, Git, PyTorch, Matplotlib, Linux	Altium Designer, LTSpice, Oscilloscope, Soldering, Logic Analyzer	Onshape, Solidworks, 3D Printing, Machining, Laser Cutting

Work Experience

Lab Diagnostics Engineer — Richmond, BC
General Fusion — 01/2024 - 04/2024

- 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 ion Doppler spectroscopy calibration using **Tkinter**, saving $20k by eliminating external software

Technical Experience

Sensors and Communications Co-Lead — 05/2024 - Present
UBC AeroDesign

- Leading a team of 9 members in the design and testing of an avionics sensor system involving IMUs, barometers, GNSS modules, and radio communication
- Used **Altium** to design the airspeed sensor **PCB** using an **STM32F103** microcontroller, and **CAN Protocol** for noise resistant communication
- Utilized **CAN, SPI, I2C, UART** to facilitate communication between various sensors and main sensor board
- 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%
- Organized meetings between avionics and mechanical teams, ensuring smooth integration under tight deadlines

Autonomous "Cooking" Robot — 06/2024 - 08/2024
UBC Engineering Physics

- Built two autonomous robots capable of collaborating to assemble toy burgers, successfully reaching semi-finals
- 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 quick parameter tuning, increasing testing efficiency by 85%
- Used **C++** to implement motor driver and state machine **firmware** on ESP32-S2 microcontrollers

Autonomous Driving AI — 09/2024 - 12/2024

- Programmed a robot to autonomously navigate obstacles and interpret signboards in a Gazebo simulation using the ROS framework, being the only team to successfully implement imitation learning
- Developed an efficient **OpenCV** algorithm for detecting and extracting text from signs at challenging angles
- Utilized **Pytorch** to train **CNNs** to recognize text on road signs achieving 99.8% accuracy on validation data
- Designed and implemented **PyQt** GUIs using **OOP** principles to efficiently collect high quality training data

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