Anna Cao

Vancouver, BC | anna.shuqi@gmail.com | annashuqicao | annascao | portfolio

EDUCATION

Electrical Engineering, Bachelor of Applied Science 2021 – 2026 | Vancouver
University of British Columbia

SKILLS

Languages — C, Python, C++, MATLAB, Verilog/System Verilog

Toolchains/Platforms — Git, Visual Studio Code, STM32 CubeIDE, PlatformIO, Altium, LTSpice, Cadence Allegro (System Capture & PCB Editor), SolidWorks-CSWA, Quartus

Embedded Systems — Raspberry Pi, Microcontrollers (STM32, ESP32), FPGAs, Circuit Analysis/Design/Debugging, Soldering

TECHNICAL EXPERIENCE

Hardware Design & Validation Engineering Intern 09/2024 – present
Intel
- Designed a central I2C interface board for streamlined debugging using **Allegro Schematic Capture** / **PCB Editor**.
- Full stack development in **Python** to support validation efforts of Intel's Integrated Circuits and products, including making a CLI and GUI I2C debug tool.
- Working on enhancing Intel's **testing software** to interface with thermal chambers via Modbus TCP to enable engineers to collect and analyze valuable data
- Gaining exposure to **computer/system architecture**, board-level digital circuitry, and validation processes.

Electrical Product Design Intern 04/2024 – 08/2024
Dometic Marine
- Performed **PCBA debugging** for boat control systems by analyzing schematics and comparing expected circuit behavior to measured signals such as **PWM** and **CAN** on the oscilloscope.
- Diagnosed and resolved motor calibration faults using various lab equipment, such as **DMMs**, **Bi-directional PSUs**, and **oscilloscopes** to identify root causes, leading to successful circuit correction.
- Designed and built a reverse polarity protection circuit following ISO standards using **Altium** and **LTSpice**, ensuring compliance with safety standards and increasing the system's operational lifespan.

Sensors and Communications Lead 05/2023 – present
UBC AeroDesign
- Leading a 9-member team in developing an avionics system for RC aircraft competing in the annual **SAE Aero Design** Competition.
- Building an STM32-based custom **flight controller** that takes RC transmitter inputs and sensor data to fly the plane.
- Designing **firmware** and **hardware system architecture** in **STM32CubeIDE** and **Altium**, developing **sensor drivers** in **C** by interpreting datasheets, and integrating sensors using **SPI**, **I2C**, **UART,** and **CAN** in a **FreeRTOS** environment.
- Teaching skills like PCB design and firmware development to members and **presenting design reviews**.

Academic Assistant - Junior Developer 05/2023 – 08/2023
UBC Okanagan
- Collaborated in developing an open-source bank of nearly 900 questions in introductory physics.
- Worked with a team to create scripts; converting existing academic resources to **Markdown**, **Python**, and **HTML**, testing them through Docker and using **Git** with a **Branch and Pull Request** method to review contributions.

PROJECTS

Aircraft Sensing System
- Developed an aircraft data aquisition system in PlatformIO using C for the STM32F1, integrating **barometer**, **IMU**, **airspeed**, and **GNSS** modules using **FreeRTOS** to provide **real-time** sensor readings and data logging to a micro SD card for post-flight analysis.
- Utilized Altium to design and construct a compact 4-layer PCB with integrated sensors, optimizing component placement and adhering to design rules - successfully collected data during this year's competition.

2-DOF Laser Projector
- Built a 2-DOF laser projector PCBA featuring the STM32H7, that drives two encoded DC motors and laser to project images.
- Designed, prototyped, and validated a **motor driver** circuit with an **H-bridge**, achieving bi-directional motor control at 50kHz while optimizing propagation delay and rise time.
- Aided **hardware/software integration** by validating PWM and UART using C for precise motor control.