Nora Shao

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Education

University of British Columbia, BASc in Engineering Physics (GPA: 4.30/4.33) Graduating April 2027

- Trek Excellence Scholarship 2022, 2023 (merit-based award offered to the top 5% of undergraduate students), Thomas Beeching Scholarship, Ausenco Scholarship for Women in Engineering,
- **Coursework:** Software Construction, Machine Learning with Python in Linux, Linear Circuits, Analog CMOS Integrated Circuit Design, Digital Systems and Microcomputers, Basic Algorithms and Data Structures

Skills

Software: C, C++, Python, Java, CAN bus protocol, MATLAB, Linux, Arduino, PlatformIO, STM32CubeIDE, PuTTY, Git, Excel/PowerQuery

Electrical: Altium Designer, PCB Assembly and Testing, Oscilloscope, Logic Analyzer, Digital Multimeter, Soldering, Harness Design with RapidHarness, LTSpice

Experience

Electrical Subteam Lead, Formula UBC Racing Design Team Jan 2025 – present

- Redesigned firmware and GUI for the FSAE steering wheel, adding features like shifting lockout, module status indicators, and improved shifting lights to enhance system functionality and driver experience
- Configured IR brake temperature sensor channels from 16-channel to 4-channel output on STMCubeIDE and an STM32F103C8T6 Bluepill with MCP2551 CAN transceiver, reducing CAN bus message congestion
- Designed schematic and PCB layout using Altium Designer for car brake light actuated by brake signal

Electrical Engineering Intern, Ideon Technologies - Richmond, BC Jan 2024 – May 2024

- Restored I2C communication between high-accuracy humidity sensor and Arduino, achieving <1% relative humidity by testing desiccants and visualizing data from PuTTY for optimization
- Designed and prototyped a QA device for a core product (underground muon detector) in SolidWorks, sourcing and assembling electrical components, reducing testing time by up to 80%
- Tested and diagnosed PCB and cable issues with a multimeter, documenting issues to develop new manufacturing requirements for reducing defect rates

Data Analyst Intern, Mantaro Capital Corp – Vancouver, BC May 2023 – August 2023

- Provided real-time visualizations of online market performance in an interactive BI dashboard via analysis, transformation, and visualization of data with Python libraries (pandas, numpy, matplotlib), helping the operations team make product decisions

Technical Projects

FSAE Steering Wheel October 2024 - present

- Programmed STM32F405RGT to receive module status from in-house Power Distribution Module (PDM) over CAN bus so drivers are alerted of module failures while driving.
- Enabled current-sensing in the PDM firmware, established thresholds based on empirical data on module current-draw to monitor module operation, and integrated feedback signals to the steering wheel
- Added safety systems like a shifting lock-out system that prevents downshifting at unsafe speeds by reading RPM values from ECU Haltech, and a check engine light actuated by Haltech.

Autonomous 'Overcooked' Robot, *cmacp33.github.io/RobotSummerTeam14* May 2024 - August 2024

- Enabled ESP32 communication via ESP-NOW protocol to control two robots with C++ to play 'Overcooked'
- Programmed STM32F103C8T6 Bluepill with PlatformIO to read reflectance of surroundings with reflectance sensor circuit, allowing robot to detect paths on the ground
- Designed schematic and PCB layout using Altium Designer for limit switches and reflectance sensor tuning
- Soldered and tested PCBs with oscilloscopes, successfully manufacturing bidirectional H-bridge driver with LT1161 gate driver and IRFZ44N MOSFETs