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

- Leading a team of 8 members in designing and integrating critical electrical modules with a race car, and enabling data collection through wiring harnesses
- Redesigned firmware and GUI for the FSAE steering wheel, adding features like a shifting lockout and module status indicators for improved functionality and driver experience
- Configured IR brake temperature sensor channels from 16-channel to 4-channel output on STM32CubeIDE using STM32F405, reducing CAN bus message congestion

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 data analysis with Python libraries (Pandas, Numpy, Matplotlib), helping the operations team make product decisions

Technical Projects

FSAE Steering Wheel October 2024 - present

- Programmed STM32F405RGT using C++ 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 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

- Developed and debugged embedded C++ firmware for an ESP32s, integrating FreeRTOS for multitasking, PID control for navigation, and ESP-NOW for inter-robot communication
- Designed schematic and PCB layout in Altium Designer for limit switch-debouncing and TCRT5000 reflectance sensors using a comparator circuit with tunable thresholds, enabling precise black tape path detection
- Integrated thresholded outputs from the sensors with the robot's PID control system to enable autonomous line-following
- Prototyped, soldered, and tested PCBs with oscilloscopes, successfully manufacturing a bidirectional H-bridge driver with LT1161 gate driver and IRFZ44N MOSFETs for robot motor control