Shuo (Josh) Zhang

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Education

University of Toronto **Expected May 2030**
*Bachelor of Applied Science and Engineering in Electrical Engineering + **PEY Co-op*** *Toronto, CA*

Skills

- **Languages:** C/C++, Verilog, Python, Matlab
- **Firmware:** HAL, **FreeRTOS**, FPGA SoC, **CAN**, **UART**, **SPI**, **I2C**, TIM, EXTI
- **Tools:** STM32CubeMX, PlatformIO, **Altium Designer**, **Qt**, Quartus, ModelSim, **KiCad**, LTSpice, Fusion 360
- **Hardware:** Soldering, Oscilloscopes, Multimeters (DMM), Logic Analyzer, Signal Generator, Power Supplies

Experience

Hardware Engineering Assistant - Internship Contract **April 2026 – Present**
Coscion Technology - Authoried Partner with X-Rite *Beijing, CN*

- Designed and validated an **EPD driver circuit**, including schematic design, component selection, and multi-panel driving.
- Designed a **constant-current boost LED driver**, including current regulation, and hardware validation.
- Designed a custom FPC adapter PCB for CMOS/CCD sensors and MCUs, with high-speed routing up to **100 MHz**.
- Developed a CMOS Driver on STM32H7 using **I²C** configuration and **DCMI + DMA** image capture at 24 MHz pixel clock
- Built a **Qt + OpenCV** imaging application through USB VCP with thresholding, binarization, and real-time image processing.

Data Analysis and Business Development Assistant **May 2025 – Present**
Dabhand Artisanat Inc. *Montreal, ON*

- Developed Python-based analysis of multi-country product sales data using **Pandas** and **NumPy**, and visualizing trends with **Seaborn** to support business decision-making.

Electrical and Firmware Subteam Member **Sep. 2025 – Jan.2025**
University of Toronto Formula Racing Team (UTFR) *Toronto, ON*

- Implemented vehicle state machine logic in **C/FreeRTOS**, managing transitions among Low Voltage, Tractive System, Ready-to-Drive modes.
- Integrated a timed precharge sequence to safely energize high-voltage relays, preventing inrush current damage from accumulator to the tractive system.

Projects

STM32-based development board **May 2026 – Present**
PCB Design

- Integrated mixed-signal circuitry with proper analog/digital power and ground domain separation to minimize noise coupling and improve signal integrity.
- Implemented onboard **USB download circuit** enabling direct firmware flashing without external tools.
- Routed and exposed key communication protocol port including **CAN, SPI, I2C, USART and more**, supporting easier external electronics development.

Power Supply Board **April 2026 – May 2026**
PCB Design

- Engineered a multi-output power management board featuring **buck, boost, inverting buck, and LDO** regulation stages for embedded electronics applications.

STM32 Thermal Sensing with Flash Backup Prototype – Embedded C **March 2026 – April 2026**
Electronics Project

- Customized protocol for temperature sensor and display it through OLED using **I2C**, achieving an accuracy of **±2%**.
- Integrated external **SPI Flash** non-volatile health data storage, ensuring history retention across power cycles.

FPGA Arcade Game (Defender) – Verilog **Oct. 2025 – Dec. 2025**
Digital Systems Project

- Designed and implemented a real-time game engine on an FPGA, utilizing a **16-bit LFSR** for pseudo-random alien spawning and coordinate generation.