Minh Nguyen

Embedded Firmware & Hardware Engineer. C/C++, FreeRTOS, ESP32-S3, STM32. KiCad PCB design, EMC.

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Experience

Associate Engineering Manager, EVident Battery — Apr 2026 – present

- Lead hardware, firmware and manufacturing for an IoT vibration-sensor product line; led the EVB-01 Pro firmware on ESP-IDF and FreeRTOS in C++20
- Designed a register-level I2C driver and an interrupt-driven FIFO drain for 6,666 Hz accelerometer and gyroscope recording (0 lost samples over 30 min)
- Cut idle current by about 95 % (radio off) with PPK2-guided power management
- Built host unit tests with fakes for FreeRTOS, lwIP and flash, a bench test runner, and the encrypted firmware release and update path
- Took the product through CE RED, FCC Part 15B and ISED ICES-003 testing as the test lab's contact

Electrical Engineer, EVident Battery — Mar 2025 – Apr 2026

- Designed and shipped the company's first sensor product, EVB-01; wrote its production firmware (Arduino C++ on FreeRTOS tasks, ESP32-S3)
- Designed and brought up the ESP32-S3 vibration sensor board (6-axis IMU, LiPo charging) through several revisions, including moving the IMU from I2C to SPI for higher sample rates
- Designed a low-power BLE sensor, a 4-layer USB-PD charging board, and 3 half-bridge motor-driver boards for a shaker test rig

Electrical Engineering Intern, Milwaukee Tool — June 2024 – Aug 2024

- Designed a MOSFET capacitor-disconnect circuit that cut battery-insertion inrush (up to 280 A) by about 46 % and stopped connector arcing on a rotary hammer; wrote the STM32 timer-interrupt firmware (IAR) that enables it; validated with LTspice, scope captures and SOA analysis

Projects

KayO arcade controller, ECE 477 senior design — Spring 2024

- Designed the whole main board in a team of four; 2-layer, 140 x 70 mm, STM32F411 with on-board ST-Link, ESP32-WROOM Bluetooth module, Li-Po charger and buck-boost

Purdue IEEE ROV — 2021 to 2024

- Designed the X14 power-conversion board; set the electrical architecture and led the electrical team for the X15 and X16 vehicles

ECELabs, Purdue ECE teaching labs

- Designed the lab FPGA, I2C and GPIO boards, wrote the I2C driver layer, and set up the Pi stations for the web lab

Education

Purdue University, BS in Electrical Engineering — Dec 2024

- GPA: 3.79/4.00, Dean's List and Semester Honors

Skills

Languages: C, C++, Python

Embedded: FreeRTOS, ESP-IDF, ESP32-S3, STM32, BLE, Wi-Fi, I2C, SPI, UART

Test and lab: GoogleTest, oscilloscope and SCPI automation, Nordic PPK2, LTspice

PCB design: KiCad, Altium (internship), hardware bring-up, EMC