MERVIN NGUYEN

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EDUCATION

University of California, Irvine — **Irvine, California**

B.S. in Computer Engineering, Dean's Honor List — **March 2026**

Coursework : Software Engineering Project in C, Object-Oriented Systems and Programming, Advanced Data Structures & Algorithms, Network Analysis II, Electronics II, Computer Architecture, Digital Systems Laboratory.

Involvement : FSAE Electric Racing, IEEE at UCI, Community Outreach of Engineering Student Council, Communication and Marketing Chair of Institute of Printed Circuits Club, Professional Development Chair of Pi Alpha Phi, FUSION at UCI.

EXPERIENCE

UCI FSAE Electric Racing Team | Irvine, CA — January 2024 - December 2024

Lead Embedded Software Engineer — **Raspberry Pi | CANBus | Teensy**

- Implemented a **fault board (Teensy 4.0)** and **sensor board (Teensy 4.1) Central Control Module**, supervising **motor output** and **fault monitoring** while facilitating diagnostic **data acquisition**, ensuring proper functioning of **safety circuits**.
- Led the development of a **digital dashboard** on a **Raspberry Pi** using **React** and **Node.js**, enhancing data visualization and user interface by displaying the current **state of charge**, **IMD fault**, **Pre-Charge Circuit**, and speed.
- Utilized **UART communication** between a Teensy 4.0 and a **Raspberry Pi 4** to display data on the digital dashboard.
- Implemented **SPI communication** between the fault board and the sensor board (**Teensy 4.1**) using a CAN Bus (**TJA1050 receiver**).
- Established a **CANBus network** to enable seamless communication among **Electronic Control Units**, ensuring cohesive operations and data exchange.
- Deployed a **push-to-start** feature in **C++** by generating a **debounce algorithm** reading current and previous value to initiate key value.
- **Recruited** and onboarded 4 Embedded Systems Engineers, introducing them to the **daisy-chain safety circuit design** and complete **C++ codebase** to accelerate project integration for the **2025 Formula SAE Michigan competition.**

Innova Electronics Corporation | Irvine, CA — May 2024 - November 2024

Software Engineer Intern — **IAR Embedded Workbench | ARM-Cortex M | FatFs**

- Optimized the **5610** and **5210 OBD2 Scan Tools**, using C, leveraging various third-party libraries and APIs for enhancing diagnostic capabilities.
- Strategically designed and implemented a comprehensive **testing framework** for optimizing **read/write performance** for an **embedded MultiMediaCard (eMMC)** on the **Renesas R7FA6M5BH3CFC microcontroller**, achieving a **78%** increase in throughput performance.
- Revised the **File Allocation Table (FAT) file system** database to minimize the behavior of **fragmentation** by allocating contiguous space for files, enhancing **system stability** and performance.
- Utilized **J-Link** and **IAR Embedded Work Bench** to modify **file handles**, manage **buffer pointers**, and implement accurate **error handling** and logging in **storage media operations.**
- Integrated **code deployment** and **validation** through **CI/CD pipelines** hosted through **GitLab**, facilitating comprehensive **unit testing**, and maintained **thorough documentation**, reducing **deployment and integration** time for **firmware release** updates.

SigmaTronix, Inc. | Santa Ana, CA — June 2023 - September 2023

Electrical Test Engineer Intern — **STM32Cube | KiCad | BGA**

- Performed electrical and functional tests utilizing a **Multimeter**, **Teradyne Optima 7300 Inspection System**, and **MyData TP9-UFP** for the development of **100+ PCBs** for **Intel**, **MX Imaging**, **Relativity**, and **Marvell**.
- Facilitated the fabrication process by leading PCB Assemblers and Quality Control Technicians, overseeing a comprehensive **Bill of Materials**, and effectively managing **time constraints** while addressing **design defects** for customer satisfaction.
- Performed **SMD soldering** and **soft soldering** in preparation of electrical testing using **Bed of Nails testing** and **X-ray imaging systems**.
- Gained hands-on expertise with **Automated Optical Inspection** (AOI) systems to capture and analyze inner **PCB surface** images, identifying issues in terms of **displacement** and **polarity** to ensure **quality assurance**.

ACADEMIC PROJECTS

Micromouse | Institute of Electrical and Electronics Engineers — October 2023 - May 2024

Embedded Software Engineer — **STM32Cube | KiCad | PWM**

- Led a year-long embedded systems project with **STM32 microcontoller** for programming in C, focusing on designing a **micromouse**, utilizing **electronic components**, **selection**, and **pathfinding algorithm implementation**.
- Utilized **embedded C** to construct code for micromouse simulation, developing **maze representation data structures**, and implementing **unit tests** for various drivers, including **motors**, **encoders**, and **IR sensors**.
- Leveraged control functions, including **PID**, to optimize mouse navigation, prototyping various algorithms for the robotic "mouse" to achieve optimal maze-solving with shortest completion time at the **UCLA IEEE All-America Micromouse Competition**.

Battle Disc | Arduino — May 2023

Collaborated Embedded Systems Project — **C++ | Adafruit Libraries | I2C Communication Protocol**

- Effectively led a collaborative team of **2 engineers** to develop a miniaturized ping pong game with Arduino Uno using **PlatformIO** and **Fritzing**, end goal of deploying **50+ systems** for after-school programs.
- Programmed in C++ with **Adafruit_GFX** and **Adafruit_SSD1306** libraries, introducing specific in-game movements/motion controls of the game.
- Designed a **board schematic**, incorporating **I2C communication** to display data on an **I2C OLED display**.

TECHNICAL SKILLS

Microcontrollers : Teensy, STM32, AtMega328P, ESP32, FPGA, Renesas.

Languages : C, C++, Python3, VHDL, SystemVerilog, JavaScript (TypeScript), Java, Kotlin.

Frameworks : React, Node.js, Next.js, Vue.js, TailwindCSS.

Operating Systems : Linux, Windows, FreeRTOS, Bare Metal.

Hardware Tools : Oscilloscope, Multimeter, DC Power Supply, J-Link, Spectrum Analyzer, Logic Analyzer, JTAG.

Software Tools : Git, Jira, Gitlab, GitHub, GitBucket, LVGL.

Environments/IDEs : Raspberry Pi, NVIDIA Jetson Orin, Visual Studio, Xilinx Vivado, STM32Cube, IAR Embedded Work Bench, Eclipse, Altium, KiCad, IntelliJ.