# **Nguyen Hoang Minh Quoc**

## **Embedded Firmware Intern**



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#### **CAREER OBJECTIVE**

As a third-year Electronics and Telecommunications student at HCMUS, I am seeking an Embedded Firmware Internship position to gain hands-on experience in microcontroller-based system development. I aim to strengthen my skills in firmware design, peripheral driver programming (UART, SPI, I2C, GPIO), and embedded system optimization while contributing to real-world IoT/embedded projects.

#### **EXPERIENCE**

#### Robotics & lot Lab (VNU-University of Sience (HCMUS))

12/2023 - 08/2025

### **STEM Tutor (Contract)**

· Instructed STEM courses for high school and middle school students, covering Arduino/ESP32 programming, peripheral communication, and hardware integration on the weekends. Inspire young people to explore science, technology, and the field of embedded programming.

### **EDUCATION**

**University of Science - VNUHCM (HCMUS)** 

2023 - 2027

#### **Bachelor of Science - BS: Electronics and Telecommunications**

- GPA: 3.73
- · Co-author and presenter of the paper: "VQASEP: Applying AI Technologies to develop a Vietnamese Q&A System on an Embedded Platform," successfully accepted and presented at the prestigious 14th Scientific Conference (VNUHCM-US Conf 2024). The project involved building a standalone voice assistant using a Raspberry Pi and Google Gemini API to deliver an intuitive, hands-free Q&A experience in Vietnamese. (Git: https://github.com/MinhQuocNguyenHoang/PeeDee\_assistant).

#### **SKILLS**

English	VSTEP B2 (Overall: 6.5/10)
Embedded Programming	C/C++, Embedded C
RTOS	FreeRTOS
Microcontrollers, Mini pc & Architecture	ARM Cortex-M, STM32, ESP32, ESP8266, Raspberry Pi, Arduino
Interfaces & Peripherals	SPI, I2C, UART, ADC, Timers, GPIO, Interrupts,
Hardware & PCB Design	PCB Design: Altium, Proteus Prototyping: Proficient in soldering SMD (QFN, TQFP, 0603) and through-hole components
Tools & Environments	Git, Github, STM32CubeIDE, Keil C, VS Code, ESP-IDF,

## **MY PROJECTS**

IoT Attendance System (RFID & Google Sheets)

08/2025 - Present

# Role: Firmware Developer and Hardware Engineering

# Responsibilities & Achievements:

- Designed and assembled a custom PCB (ESP32 + RC522 RFID + LCD 16x2 + power supply) using Altium.
- · Integrated RC522 RFID reader via SPI protocol to read card data, and displayed attendance status on a 16x2 LCD through I2C interface.
- Implemented FreeRTOS tasks and inter-task queues for RFID scanning, Wi-Fi communication, and HTTPS data transmission to Google Sheets.
- Developed a Wi-Fi provisioning feature (BLE) allowing users to configure network credentials via mobile app.

Technologies & Skills: ESP32 (ESP-IDF, FreeRTOS), UART (debug logging), HTTPS (Google Sheets API), Altium PCB, Embedded C Git: https://github.com/MinhQuocNguyenHoang/attendance\_SYS

Calculator with Keypad and LCD

06/2025 - 08/2025

### Role: Firmware Developer and Hardware Engineering

## Responsibilities & Achievements:

- Designed and assembled a custom PCB (STM32 + Keypad(created from buttons) + LCD) using Altium.
- Implemented keypad (created from buttons) input handling with debouncing to ensure reliable multi-step operations.
- Developed a custom driver for 16x2 character LCD using direct GPIO control (4-bit parallel interface), without relying on external I2C modules, to display real-time results.
- · Applied FreeRTOS tasks to process (input polling, calculation, display update).
- · Extended functionality to support first- and second-degree equations in addition to basic arithmetic.

Technologies & Skills: STM32, FreeRTOS, GPIO, LCD 16x2, Altium PCB, Embedded C

Git: https://github.com/MinhQuocNguyenHoang/Calculator

**Role: Firmware Developer** 

### **Responsibilities & Achievements:**

- Developed firmware drivers on STM32, including GPIO driver for LED control and ADC interrupt-based driver for gas detection.
- Implemented UART communication between STM32 and HC-06 Bluetooth module for mobile app connectivity.
- Integrated automated door-opening feature triggered by MQ2 sensor via ADC interrupt handling.
- Debugged and tested firmware using SWD interface and STM32CubeIDE.

Technologies & Skills: C/C++ Embedded, STM32 HAL/LL, UART, ADC, Interrupts, Bluetooth HC-06, Sensor Integration, SWD Debugging. Git: https://github.com/MinhQuocNguyenHoang/LiteHouse

Video project: https://drive.google.com/drive/folders/1lyHeAX215S69uxc0pfSo29VWZflstxH-?usp=sharing

# **ACTIVITIES**

### Robotics & IoT Lab (HCMUS & American Center)

Technical Supporter — Supported teams in ROBOCUS 2024–2025, handled C/C++ & Arduino troubleshooting, and assisted STEM workshops in Mekong Delta.

### Ngo Quyen High School

Technical Advisor — Optimized Arduino + HC-05 (UART) vehicle control and developed an MIT App Inventor mobile app.

### FRACE (2024)

Finalist — Line-following car competition.

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