Nguyễn Hoàng Minh Quốc

Embedded Firmware Intern

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CAREER OBJECTIVE

Seeking an internship in embedded firmware development with a focus on real-time task management, peripheral interfacing, and IoT system integration. My goal is to build reliable embedded firmware for microcontrollers, enabling efficient data acquisition, communication with external peripherals, and seamless integration with IoT platforms.

EDUCATION

University of Science - VNUHCM (HCMUS) 2023 - 2027

Bachelor: Electronics and Telecommunications

- **GPA: 8.7/10**
- **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/Biu2005/PeeDee_assistant).

SKILLS

Embedded Programming	C/C++, Embedded C, 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) 22/08/2025 - Present

Role: Firmware Developer and Hardware Engineering

Description:
Developed an ESP32-based IoT attendance device focusing on real-time task scheduling, peripheral interfacing, and reliable IoT connectivity with Google Sheets as the cloud client.

Responsibilities & Achievements:

- Designed and assembled a custom PCB (ESP32 + RC522 RFID + power supply) using Altium.
- Integrated **SPI-based RFID module (RC522)** for card reading and authentication.
- Implemented **FreeRTOS tasks** to manage RFID scanning, WiFi communication, HTTPS data transmission, and system status update.
- Developed **WiFi communication** with retry and error handling for reliable cloud connectivity.
- Integrated **HTTPS client** with certificate validation to securely sync attendance records directly to **Google Sheets**.
- Optimized **power consumption** using deep sleep and wake-on-interrupt from RFID module.

Technologies: ESP32 (ESP-IDF, FreeRTOS), SPI (RC522), UART (debug logging), HTTPS (Google Sheets API), Altium PCB, Embedded C
Git: https://github.com/Biu2005/attendance_SYS.

Calculator with Keypad and LCD 06/2025 - 19/08/2025

Role: Firmware Developer and Hardware Engineering

Description:
Built a handheld calculator on STM32, applying FreeRTOS for task scheduling and peripheral interfacing to handle keypad inputs, perform calculations, and display results on an LCD.

Responsibilities & Achievements:

- Designed and assembled a custom PCB (STM32 + Keypad + LCD) using Altium.
- Implemented **keypad input handling** with debouncing to ensure reliable multi-step operations.
- Integrated **LCD 16x2 module** via GPIO 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: STM32, FreeRTOS, GPIO, UART (debug logging), LCD 16x2, Altium PCB, Embedded C
Git: https://github.com/Biu2005/Caculator

TEAM PROJECTS

LiteHouse - Smart Home System (STM32)

- Team size : 3

- Programmed an STM32-based smart home system to control devices (servos, relays) via a Bluetooth mobile app.
- Implemented an automated fire-response safety feature that triggers alarms, sends mobile alerts, and opens doors upon gas detection (MQ2 sensor).
- Git: https://github.com/Biu2005/LiteHouse
- Video project: https://drive.google.com/drive/folders/1IyHeAX215S69uxc0pfSo29VWZflstxH-?usp=sharing

Checkpoint Timing System (ESP32)

- Team size: 2
- Developed firmware for a race timing system using **ESP32** to capture vehicle lap times at checkpoints.
- Utilized **WebSockets** to transmit real-time data to a web dashboard, ensuring low-latency delivery and accurate time synchronization for the competition.
- Git: https://github.com/Biu2005/Checkpoint-System

ACTIVITIES

Robotics & IoT Club (HCMUS) 08/2023 - 08/2025

STEM Educator: Led and instructed Arduino courses (basic & advanced) covering embedded programming, UART communication, and hardware integration for club members.

Technical Supporter (ROBOCUS Competition 2024, 2025): Provided live technical support and troubleshooting (C/C++, Arduino) for teams with line-following and remote-controlled vehicles.

Ngo Quyen High School 11/2024 - 01/2025

Technical Advisor

- **Provided solutions and optimization strategies for remote-controlled vehicles (Arduino) communicating via Bluetooth (HC-05, UART) with an MIT App Inventor mobile app.**

American Center 12/2024 - 01/2025

Technical Supporter

- **Served as a technical support member for a STEM outreach program, assisting with workshops and technology demonstrations at universities across the Mekong Delta.**

CERTIFICATE

English: VSTEP B2 (Overall: 6.5/10) 15/06/2025