# Nguyễn Hoàng Minh Quốc

## **Embedded Engineer Intern**

U 0389378725 ☐ quoc20053008@gmail.com Ø https://github.com/Biu2005 Phú Thuận Ward, TP.HCM





#### CAREER OBJECTIVE

Seeking an Embedded Engineer Intern position to apply C/C++ skills in microcontroller firmware development, real-time task management, and peripheral interfacing. Eager to gain hands-on experience contributing to reliable embedded systems and IoT integration.

## **EDUCATION**

University of Science - VNUHCM

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 O&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 (1 Hardware + 1 Firmware + 1 Software)
- Role: Firmware Developer

- Programmed an STM32-based smart home system to control devices (servos, relays) via a Bluetooth mobile app (MIT APP INVENTOR).
- 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 (1 Firmware + 1 Software(Web))
- Role: Firmware Developer
- 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

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