Pham Huu Nghia

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# Experience

## 8/2024 – PRESENT

## **Working as a freelancer in embedded IoT programming**

As a freelance Embedded IoT Programmer, I specialize in collaborating closely with clients to transform their ideas into reliable, high-performance IoT solutions. Combining strong expertise in embedded systems, low-power optimization, and IoT protocols. I ensure seamless communication at every stage of the project. I pride myself on quickly learning and adapting to new technologies, enabling me to tackle diverse challenges and deliver innovative, scalable solutions. My commitment to technical excellence and client satisfaction ensures businesses can effectively integrate cutting-edge IoT technology into their operations.

## 8/2023 – 11/2023

### C/C++/Embedded Dev Engineer (Intern)| TMA Solutions | District 12, Ho Chi Minh City

During my internship, I gained experience in programming with C/C++, developing and optimizing applications in real-world environments. I worked on the Linux operating system, proficiently using tools such as Git, Bash Script, and system management. Additionally, I became familiar with the Agile methodology, participating in activities like sprint planning, daily stand-ups, and reviews to ensure project progress. Besides technical skills, I also developed soft skills such as effective team communication, flexible problem-solving, time management, and the ability to learn quickly in a dynamic technology environment.

# Education

## SepTEMBER 2020 – SEPTEMBER 2024

### Bachelor of Computer Engineering Technology | HCMC University of Technology and Education | Thu Duc City

# Skills

• **Programming Languages/Hypertext:** C/C++, Python, Bash Scripts, HTML, CSS, Java Script, C#.

• **Programming Methods:** OOP, RTOS.

• **Microcontroller/Embedded Computer:** AVR, ESP32, STM32, 8051, Raspberry Pi, Jetson Nano.

• **FPGA:** TangNano9k, Xilinx Spartan 3E.

• **Communication Protocols:** UART, SPI, I2C, I2S (CS43L22), CAN.

• **Tools:** VM Ware, Cadance Virtuoso, Vivado, Eclipse, Xilinx ISE, Matlab/Simulink, VS Code, GDB, Git, Valgrind, STM32Cube, Altium, Proteus, Vim…

• **OS:** Linux.

• **Frameworks/Library:** PyTorch, Keras, PyQt5, Pandas, Numpy, OpenCV.

• **Non-Tech:** Problems-Solving, Good Communication, including communicating with English. Japanese (Beginner).

# Achievements

• 3rd prize for the Xmas Gift model designing and LED effect programming competition (Organized by the Faculty of Electrical and Electronics Engineering, HCMUTE).

• Study Encouragement Scholarship (2023) (B type).

# Projects

**Design and Simulation of a Digital Signal Processing FIR Filter on FPGA**

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| --- | --- |
| **Programming Languages** | MATLAB, Verilog |
| **Team Size** | 1 |
| **Decription** | The FIR Filter project focuses on designing a digital filter for signal processing on an FPGA, offering key functionalities such as noise removal and unwanted frequency filtering. Its high-performance implementation on FPGA enables faster signal processing compared to traditional CPUs or MCUs, ensuring real-time compatibility with minimal latency for embedded applications. Practical applications include filtering sensor signals in IoT systems, audio signal processing in communication devices, and enhancing signal quality in medical devices such as ECG or EEG systems. |
| **Tools** | MATLAB, Vivado (Simulate), Gowin |
| **Hardware** | TangNano9K |
| **Github** | https://github.com/Jerguel02/FIR\_IIR\_Filter.git |

**The automatic mulberry cultivation system uses hydroponic methods**

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| --- | --- |
| **Programming Languages** | C++, Python |
| **Team Size** | 2 |
| **Decription** | The mulberry cultivation system is cared for through automatic observation and utilizes IoT knowledge to implement the system, using ESP32 hardware and controlled via a web interface and TFT touchscreen. Communication between the web and ESP32 is done through Firebase, optimizing and enhancing the system's smoothness by using FreeRTOS. |
| **Tools** | Arduino IDE, VS Code, Altium. |
| **Hardware** | 4" TFT screen, ESP32, sensor, motor, ACS712 (30A), Relay. |
| **Processes/Tasks/Interfaces** | SPI, I2C + Interrupt, FreeRTOS, multitasking. |
| **Frameworks** | FreeRTOS, PyQt5 (Design an application with an interface that converts images to hex code, and creates images by drawing pixels on the app. |

**YOLO-based Sign Language Recognition for Deaf, Blind and Dumb Individuals**

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| **Programming Languages** | C++, Python, BashScripts |
| **Team Size** | 2 |
| **Decription** | Use YOLOv8 algorithm to recognize sign language gestures. Translate gestures into text and audio and analyze facial expressions to understand the user's emotional state better. Use push buttons combined with interrupt handling to perform a task inside a PyQt5 application. |
| **Model** | YOLOv8 |
| **Hardware** | Jetson Nano, Camera, Screen, Speaker/headphone |
| **Processes/Tasks** | Interrupt Handling, Multithreading. |
| **Frameworks** | PyQt5, PyTorch. |
| **Github** | https://github.com/Jerguel02/YOLO-Based-Sign-Language-Recognition-for-Deaf-Blind-and-Dumb-Individuals-For-Jetson-Nano |

**THE MUSIC PLAYER UTILIZES STM32.**

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| --- | --- |
| **Programming Languages** | C |
| **Team Size** | 1 |
| **Decription** | Using STM32 as the central memory unit for the music player, controlling phone operations connected via Bluetooth to HC05, communicating with STM32F4 via UART interrupts, retrieving song data from the memory card via USB, and outputting sound through I2S and CS43L22. |
| **Tool** | STM32Cube |
| **Hardware** | STM32F407-DISC, HC05, CS43L22, Speaker. |
| **Processes/Tasks/Interfaces** | UART, I2C, I2S, USB, Bluetooth, UART Rx Interrupt Handling. |
| **Github** | https://github.com/Jerguel02/STM32F4-Music-Player |

**DESIGN BILLBOARD ADVERTISEMENT USING P5 LED MATRIX**

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| --- | --- |
| **Programming Languages** | C, C# |
| **Team Size** | 2 |
| **Decription** | Write a C program to load into the microcontroller for displaying desired images on a P5 LED matrix. The data input to the module will go through a conversion step from an image to Hex code using Winform. Develop a program to accomplish this task. |
| **Tool** | STM32CubeMX, STM32CubeIDE, KeilC, Visual Studio. |
| **Hardware** | STM32F1, STM32F4, P5 Led Matrix |
| **Processes/Tasks/Interfaces** | USB, Interrupt Handling. |
| **Github** | https://github.com/Jerguel02/QuangBao |