PHAM NGUYEN QUOC HUNG

Embedded Software Engineer

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Summary

With over 1 year of experience in the field of Embedded Software and a passion for electronics, I have been approached and have developed embedded systems for many applications such as device control, monitoring systems, and IoT (Internet of Things). During my work, I have accumulated in-depth knowledge of programming languages, especially C/C++, various communication protocols, and other skills to effectively solve problems, ensuring the stability and reliability of the products.

Education and training

Sai Gon University (Student) *2017 - 2022*

- **Specialization**: Telecommunications Electronics
- **Degree**: Engineer
- **GPA**: 2.72/4.0
- **TOEIC**: 545

Commercial & Technical STD Company (Internship) *07/2020 - 08/2020*

- Support repairing damaged UPS devices.
- Research PROLiNK Sonority II Wireless Smart Speaker for device control via voice commands.
- Participate in installation and maintenance of UPS battery units in buildings.

FPT Telecom – IoT LAB (Internship) *05/2021 - 05/2022*

- Learn data structures and algorithms, practiced solving problems on platforms like Codeforces, SPOJ, UVA, Hackerrank.
- Explore and approach architectures designed for embedded systems (RTOS, Event-Driven).
- Experience with the GNU/Linux Ubuntu operating system and command-line interface.

Skills

Technical skills

- Programming Languages: C/C++, Shell script, Makefiles for build automation.
- Microcontroller and Microprocessor Familiarity: ARM, AVR, PIC.
- Embedded Operating Systems: FreeRTOS, Linux.
- Platform and Framework: ESP-IDF, STM32CubeIDE, Visual Studio, Qt.
- Communication Protocols: UART, SPI, I2C, CAN, Ethernet, USB.
- Network Protocols: Socket, UDP/TCP, MQTT, BLE, Wifi, Modbus.
- Knowledge of FOTA, Bootloader for embedded system.
- Design HMI (HMI Delta) and LUA Script programming using DOPSoft.

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Skills (Continue)

Soft skills

- Logic analysis for debugging and testing.
- Schematic analysis and technical documents.
- Ability to work independently, research to solve issues during project execution.

Teamwork skills

- Ability to work effectively in a team environment.
- Listening and communication and collaboration.
- Sharing knowledge and expertise with team members.

Experience

FPT Telecom – IoT LAB (Embedded Software Engineer) *05/2022- Present*

- Assume the role of developing firmware for management and monitoring systems and devices.
- Receive requests for system troubleshooting and maintenance when there are incidents on the infrastructure where equipment is installed.
- Research new solutions and technologies to serve technical issues.
- Supporting interns in their learning process and guiding their career paths.

Project

Real-time Locating System *07/2022 – 09/2022*

Description

- A Real-time Locating System (RTLS) utilizes UWB (Ultra-Wideband) technology to enable real-time device positioning, also known as *tag*.
- The system comprises:
  - Gateway.
  - Anchor.
  - Tag.

Contribution

- Firmware developement:
  - Developing firmware for the MCU (Microcontroller Unit) to send AT commands (via UART) for configuring the DWM1001 Decaware Module to function as a *tag*.
  - Optimizing power consumption for *tag* usage.
  - Handle income message from the *gateway* to control the buzzer built-in.
  - Setup the *anchors* coordinates according to the mentor's instructions.

Tech Stack

- Programming language: C/C++, Makefile.
- Tool: Logic Analysis Pulse, Decawave DRTLS Manager, Git.

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Project (Continue)

Outdoor POP Monitoring System *10/2022 – 08/2023*

Description

- OPMS (Operations and Infrastructure Management System) is a system designed to manage and monitor FPT Telecom's infrastructure through sensors and algorithms. It is intended to control devices in critical situations.

Contribution

- Supporting firmware development with the following features:
  - Monitoring sensors and devices status in POP.
  - Handle requests from master device (Orange Pi Plus 2E, Tinkerboard S R2.0).
  - Firmware over the air.
  - Synchronize Web Portal integration firmware for OPMS versions (V1.3 - V1.6).
- Support testing APIs before deploying Web Portal.
- Participate in the production process and test equipment at the factory:
  - Ensure the operation of the device hardware.
  - Design script to automatically flash OS for Orange Pi Plus 2E, Tinkerboard S R2.0.

Tech Stack

- Programming language: C/C++, Makefile, Shell script.
- Tool: DSView, Git, SVN.
- Protocol: MQTT, Modbus.

Roof Security System *04/2023 – 06/2023*

Description

- Roof Security System monitors and warns of intrusion based on signals from sensors and provides timely warnings in case of unauthorized intrusion from the roof.

Contribution

- Firmware developement, including the following features:
  - Monitoring sensors and devices that are plugged in and reporting to the gateway when there are signs of abnormalities (Disconnected and warning).
  - Receive and process control requests from gateway device (NanoPi NEO).
  - Firmware over the air.
  - Automatic detection when the OLED screen is plugged in. This feature is designed for quick hardware testing at the manufacturing facility.
- Design a script to automatically load the OS for the NanoPi NEO and ensure the operation of the device during installation.
- Integrate the system into the IOT Platform (Thingsboard) for remote monitoring.

Tech Stack

- Programming language: C/C++, Makefile, Shell script.
- Tool: Git, Tailscale.
- Platform: Thingsboard, FriendlyARM.
- Protocol: Modbus.

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Project (Continue)

ODF Automated Infrastructure Management *04/2023 – 07/2023*

Description

- ODF AIM is a monitoring and management system for FPT Telecom's Optical Distribution Frames (ODF) infrastructure. It consists of:
  - AIM Web: Allows to manage the port database, create Work Order (To do list).
  - AIM Controller (HMI): Receives Work Orders from AIM Web and displays information at the field location.
  - AIN Sensor Base: ODF Mask (A place for inserting and extracting optical ports).

Contribution

- Firmware developement, including the following features:
  - The role responsible for detecting and handling the plug-unplug of ports in ODF Mask.
  - Integrate with AIM Controller (HMI) to execute Work Orders.

Tech Stack

- Programming language: C/C++ Embedded, Makefile.
- Tool: Git.
- Framework: Qt.
- Protocol: Serial communication, CAN Bus.

Operation Monitor Base Transciever Station *08/2023 – 09/2023*

Description

- OMBTS station monitoring system solution based on device management files on gateway (NanoPi NEO). Developers can easily integrate their systems into the monitoring suite through editing these management files.

Contribution

- Firmware developement, including the following features:
  - Automatically generate management files when the server initializes.
  - Ensure controlled devices when there are file manipulations as well as sensor values are always updated in management files.
- Provide equipment usage documents to users.

Tech Stack

- Programming language: C/C++, Makefile.
- Tool: Logic Analyzer Saleae, Git.
- Platform: FriendlyARM on NanoPi NEO.
- Protocol: Modbus.

Reference

 Github

 Personal WebPage

 LinkedIn