Pavendhan V

Sr. Firmware Developer

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Summary

With over 6 years of expertise in designing, developing, and implementing embedded firmware development. Proficient in C/C++, ARM Cortex-M, and real-time operating systems (RTOS), with a strong background in microcontroller architecture and peripheral interface. Proven ability to troubleshoot and resolve software issues. Managing all aspects of the product development cycle, including input, processing, and output. Passionate about continuous learning and staying updated with the latest advancements in embedded systems technology.

Skills & Expertise

Languages:

- Proficient**:** C, C++, Shell Script.
- Basic Knowledge**:** Python, C#.

MCU:

- LPC1769, STM32F3/F4, nRF52840, ESP32, ESP8266, Raspberrypi3, Beaglebone Black.

Communication Protocols and Peripherals:

- UART, SPI, I2C, CAN, TCP/IP Protocol, UDS, BLE (basics).
- GPIO, Watchdog Timer, Timers, Interrupts, PWM, ADC, DAC, DMA.

Operating Systems and Tools:

- RTOS**:** FreeRTOS and Zephyr RTOS (basics).
- Embedded Linux**:** Yocto and Buildroot (basics).

Hardware Skills:

- Circuit Design, PCB Gerber Verification, Board Testing and Board Bring-Up.

Instrumentation:

- Digital Storage Oscilloscope (DSO), Logic Analyzer, CAN Analyzer, Digital Multimeter.

Agile: Software development process and tools: Jira and Bitbucket

Version Control: Git.

Experience

Embedded Testing Engineer at Panacea Medical Technology Pvt Ltd.

Aug 2018 to Dec 2019

Roles and Responsible:

1. Creating unit and integration test cases based on requirement documents, executing them on a machine, and closing bugs with team members.
2. Offering product and functionality support to internal and external teams.
3. Coordinating with the design team to test machine functioning and performance.

Firmware Developer at Panacea Medical Technology Pvt Ltd

Jan 2020 to Feb-2023

Roles and Responsible:

1. Designing and developing new items for product enhancement. Developing a firmware and backend applications for ECUs.

2. End-to-end product development activities include requirement analysis, architecture design, firmware development, board presentation, unit and integration testing, debugging, and technical documentation.
3. Taking ownership at the module and product levels and carrying it out autonomously.
4. Coordinating with several teams, including software, verification and validation, mechanical, production, and quality control, to ensure successful project integration and deployment.
5. Providing product and process assistance to both internal and external team members.
6. Maintaining product configuration management.
7. Manage product development operations including input, processing, and output.
8. Follow corporate standards, best practices, and product/program requirements while completing activities under management guidance throughout the development life cycle.

Project Handled:

Mammography

1. Develop and integrate firmware for a digital mammography system aimed at enhancing breast cancer detection and diagnosis
2. Developing the firmware to control the X-Ray Generator (Spellman) and to turn the X-Ray via UART communication and clock signals from MCU to generator.
3. Smooth control of pneumatic compression pad control and various motion control via DC motor (Gantry, Tomo, Prone, pillar and X-Ray collimator)
4. Read each motion feedback (ADC) and calibrate and show each motion position.
5. Designing the Hardware boards for the project and board bring up.
6. Communicate with LCD display to show the machine positions and operating mode
7. Ethernet communication between MCU (LPC1769) and backend for controlling machine for different motion and X-Ray unit.

Multi Leaf Collimator

1. Developed a firmware for the precise control of MLC leaves, ensuring accurate radiation delivery.
2. Developed the parallel communication (20 lines) between MCU (LPC1769) and FPGA (Spartan 6) for data and command transmission.
3. Calculate the location of each leaf using the primary (ADC and Encoder) and secondary (PWM counts) of the DC and Stepper motors. Reading the IR sensor and Limit switch status for various activities.
4. Developed a calibration and homing method for precise placement of leaves, jaws, and colli theta motions.
5. Developed a different positioning algorithm process for cancer treatment. (Manual, Auto and VMAT)

TCP/IP Server and Client Implementation for data sharing between Android and Backend Application.

Created a TCP/IP server to communicate with MCUs and Android apps using a defined protocol format.

Sr. Firmware Developer at Capgemini **Feb 2023 to Present**
Environmental sensor project at BOSCH (Client)

1. Developing the optimized firmware to interface with the environment sensor, utilizing I2C and SPI communication protocols.
2. Integrating ML algorithms into firmware for processing sensor data such as temperature, humidity, pressure, gas resistance measures and predicting the gas present in the environment.
3. Optimized power consumption to extend battery life while maintaining high-performance data acquisition.
4. Implemented data logging for SD cards, external flash memory, and USB serial data streaming.
5. Connect the MCU and mobile app over BLE to broadcast sensor and ML data for real-time visualization and analysis.
6. Developing firmware for new use cases based on client demands, following software guidelines and utilizing agile process management.
7. Creating firmware to showcase the product with various MCU cortex (nRF52840, M4, ESP32, ESP8266), publishing it on GitHub, and answering GitHub questions.
8. Using GTest to do firmware unit tests.
9. As part of the firmware release process, handling the Jenkins build for performing unit tests, PC-lint and creating SonarQube reports for software KPI and deployment to the artifactory for internal and external teams, as well as FOSSID OSS inspections.

Development Tools Keil uVersion, MCUXpresso, STM32 Cube IDE, Segger Embedded Studio, Arduino, Visual Studio, QT Creator, ORCAD.

Education

BE in Electrical and Electronics Engineering, 2014-18 – 70%
Government College of Engineering, Bargur

High School Certification, 2014. - 90%
Government Higher Secondary School, Vadugamuthampatti.

Personal Competences

1. Confident
2. Quick learner, Positive attitude
2. Can easily adapt to new technologies
3. Can work independently or as a part of team effectively

Personal Details

Name	: PAVENDHAN V
Date of birth	: 31st MAR 1997
Mother's name	: KRISHNAVENI
Fathers name	: VENKATESAN
Permanent address	: #152 Vadugamuthampatti, Kurisilapattu(PO), Titupattur, Tamilnadu, 635702.
Languages known	: English, Tamil, Telugu and Kannada.

DECLARATION I hereby declare that, the information furnished is true to the best of the knowledge and I bear the responsibility for the Correctness of the mentioned above particulars.

Date:
Place: Bangalore PAVENDHAN V