

# EMIN RIYAZ

## Embedded Software Engineer

Gained hands on experience in Embedded Software Development with a good exposure in Micro-Controllers, Micro-Processors, Application, Board Support Package which includes Sensor Interfacing, Application Development, Driver implementation, Configuration and Compilation of Bootloader, Kernel, Yocto Project, Embedded Linux Porting and Board Bring-up.

**GitHub :** <https://github.com/erz985>

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## EXPERIENCE

### Phytex Embedded Pvt. Ltd. Bengaluru, Karnataka

**Embedded Software Engineer**                      July 2023 – Till Date

## TECHNICAL SKILLS

- C Programming Language
- Knowledge on STM32 Microcontroller
- Knowledge on Communication Protocols – UART, SPI, I2C, CAN, RS485
- Knowledge on Board Support Package; Boot loader, Kernel
- Board Bring-up
- Knowledge on Yocto Project
- Working experience in Application Development and Sensor Interfacing
- Working with Linux Environment
- Embedded Linux Porting
- Good analytical, logical and debugging skills
- Ability to read schematics and datasheets
- Exposure to STM32F Series Micro-controllers
- Exposure to i.MX6UL, A5D2x Micro-Processors

## PROJECTS

### 1. IoT based Temperature and Humidity Data Monitoring and Transmission using STM32 Micro-controller and Rugged Board A5D2x Micro-Processor.

**Description:** Designed a multi-stage IoT project showcasing diverse interfacing and functionalities. In Stage 1, interfaced DHT11 sensor with STM32, capturing temperature and humidity data displayed on the terminal via UART. Stage 2 involved WE-10, transmitting DHT11 data to the cloud via MQTT Protocol. Stage 3 connected STM32 with DHT11 to the Rugged Board, displaying data on the terminal. Finally, in Stage 4, unified all stages, creating a comprehensive end-to-end IoT system for acquiring, processing, and transmitting environmental data from DHT11 to the cloud through STM32, Rugged Board A5D2x, and WE-10.

**Micro-controller Used :** STM32F446RE

**Micro-Processor Used :** Rugged Board A5D2x

**Sensors Used :** DHT-11, WE10.

**Interface and Peripherals Used :** UART, Timer, MQTT

**Debugging:** With breakpoints

**Programming Language :** C with STM32 HAL Libraries

**Outcome :** Successfully delivered a robust end-to-end IoT system by designing and implementing a multi-stage project. Achieved seamless interfacing of sensors (DHT11 and WE-10) with the STM32 micro-controller and Rugged Board A5D2x micro-processor. Demonstrated proficiency in data acquisition, processing, and transmission, showcasing expertise in UART and MQTT protocols. The project showcased not only technical skills in hardware interfacing but also the ability to integrate diverse components into a comprehensive IoT solution.

## 2. STM32 Microcontroller Based Wi-Fi Smart Switch

**Description :** The primary objective was to enable remote control of the switch through MQTT commands sent from a cloud-based platform. The switch is connected to STM32 MCU through MQTT cloud using the Wi-Fi Module using UART Interface.

**Microcontroller Used :** STM32F446RE

**Interfaces and Peripherals Used :** UART, ADC, Timer, Switches , WE10.

**Feature :** State Machine

**Programming Language :** C Programming

**Outcome :** The project successfully implemented a control system for a switch connected to an STM32 microcontroller unit (MCU) through MQTT Cloud using a Wi-Fi module with UART interface.

## 3. Yocto BSP for phyCORE-i.MX 6UL, RuggedBoard-A5D2x

**Hardware:** phyCORE-i.MX 6UL, RuggedBoard-A5D2x

**Description:** The aim of this project is to develop a complete Board support package (BSP) for phyCORE-i.MX 6UL, RuggedBoard-A5D2x which includes customization of Yocto Root File System.

**Responsibilities:**

- Porting and board bring up.
- Adding new packages to the custom meta layer.
- Customization of BSP according to customer requirements.
- Tool chain generation for cross-compilation.

## 4. IoT-based Temperature and Humidity Monitoring

**System Hardware:** STM32, AHT25, WE-10

**Description:** Reading temperature and humidity data through an AHT25 sensor, which is integrated with an stm32 microcontroller and supported by a WE10 module for data transmission, using a Finite State Machine for data processing.

**Responsibilities:**

- Porting and board bring up.
- Developing application for reading values from AHT25 temperature sensor.
- Sending the readings to cloud via MQTT protocol.

## 5. Kernel Updation Project - phyCORE-i.MX 6UL Board

**Hardware:** phyCORE-i.MX 6UL Board

**Description:** Led the successful migration of the Linux kernel on the phyCORE-i.MX 6UL board, transitioning from the Linux mainline version 5.10 to the customized phyCORE Linux-kernel version 6.1.

### Responsibilities:

- Conducted a comprehensive assessment of the existing kernel to identify and address compatibility issues with the target version.
- Managed kernel configurations, ensuring optimal settings for the hardware and system functionalities.
- Collaborated with the development team to integrate and adapt device drivers to the updated kernel, resolving compatibility issues.
- Executed rigorous testing procedures to validate the stability, performance, and functionality of the updated kernel.
- Produced detailed documentation outlining the kernel update process, configurations, and modifications made for future reference.

## 6. Sensor Interfacing: Successfully interfaced a variety of sensors including GSM, Bluetooth, WE10, AHT25, DHT11 Temperature Sensors, Seven-Segment Display, RTC, and RFID with the STM32F411RE Nucleo board.

**Hardware Integration:** Implemented seamless integration of sensor data into the STM32F411RE Nucleo board, ensuring accurate and reliable communication between sensors and the microcontroller.

**Embedded Systems Development:** Contributed to the development of embedded systems, focusing on enhancing the functionality and efficiency of sensor modules.

**AHT25 Temperature Sensor Integration:** Implemented the integration of the AHT25 temperature sensor, contributing to enhanced data acquisition capabilities in embedded systems.

**STM32F411RE Nucleo Board:** Demonstrated proficiency in working with the STM32F411RE Nucleo board, showcasing skills in microcontroller programming, interfacing, and troubleshooting.

**Project Documentation:** Maintained comprehensive documentation of sensor integration processes, providing valuable resources for future reference and project scalability.

**Quality Assurance:** Conducted rigorous testing and quality assurance procedures to validate the accuracy and reliability of sensor data within the embedded systems.

**Achievements:** Successfully implemented sensor interfaces, contributing to the overall enhancement of the STM32F411RE Nucleo board's capabilities.

## **EDUCATION**

- B.Tech in Mechatronics Engineering, SRM IST, KTR, Tamil Nadu 2022.
- 12<sup>th</sup> from Al-Farook Residential Senior Secondary School ,Kozhikode, Kerala 2018,
- 10<sup>th</sup> from Al-Farook Residential Senior Secondary School ,Kozhikode, Kerala 2016,

## **CONTACT DETAILS**

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