ARAVIND PV

Senior Embedded Software Developer

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Kochi Kerala

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Professional Summary

Dynamic and detail-oriented Senior Embedded Developer with a proven track record in BSP-level programming, IOT systems, automotive embedded systems, and real-time operating systems. **Over 3 years of hands-on experience** with STM32, IMX, and ARM-based boards, proficient in communication protocols like I2C, UART, SPI, and CAN. Strong expertise in Linux-based environments, debugging, and system optimization. Adept at utilizing advanced tools and YOCTO to deliver scalable, high-performance solutions. Certified in modern software development practices, including Agile methodologies and clean coding. Eager to contribute to innovative projects and drive technological advancements in embedded systems development.

Technical Proficiency & Skills:

Category	Details
Microcontrollers and Boards	• 32bit based STM32, ESP32, RP2040 • IMX6 dev board, Arduino. • 16bit based Microchip PIC24 • RaspberryPi (Microprocessor – Arm Cortex)
Internal Peripherals	• I2C/SPI/UART/CAN/Modbus • TIMER/PWM, ADC • Interrupts • GPIO • RS-232 RS-485
External Peripherals	• ADXL335 Accelerometer sensor • Ultrasonic sensor HC-SR04, R307-s, PN532 • Analog Sensors • Radar Sensor • GSM EC200U Module
IDE'S & Editors	• Visual Studio • STM32 Cube IDE • Eclipse, Keil • Nano, Gedit. • VIM • Bash script
Debugging tools	• Debugprobe (Raspberry-pi -SWD) • CubeIDE Debugger • Raspberry Pico as Serial wire debugger. • Digital Signal, Digital Multimeter, USB to TTL
Tracking tools	• GIT • Tortoise SVN • JIRA
Languages	• Embedded C, C++(beginner), Python.
Frameworks/Distributions/OS	• Linux Yocto • WSL • Qemu • West • Agile • FREERTOS, ZEPHYR RTOS

Career Summary:

Senior Embedded Software Developer Inditronics Pvt. Ltd. Pune
May 2025 – Present

Projects Handled

➢ **APM For Monitoring Viewership status**
Customer: India, Nepal Duration: Completed
Project Description:

- Advanced people meters attach along with the HDMI output goes to the TV which captures the data from the visual and sends the data to cloud using GSM module onboard

Responsibilities

- Debugged SPI handler issue for MCU for Raspberry Pi SoC.
- Assigned the interrupt handler to resolve the issue related to spi for MCU.
- Developed custom bootloader for handling OTA for MCU from Rpi.

➢ **Industrial IOT Gateway**
Customer: POC Duration: Ongoing
Project Description:

- Gateway supports reading multiple sensors reading using MODBUS protocol with RS485 and send the sensor data to the cloud. Also, MODBUS-TCP on board along with GSM – ethernet fallback mechanism. Sending data to aws for further use.

Responsibilities

- Designed the project plan
- Collaborated on hardware bring-up, embedded driver IO Driver development and optimization.
- Developed code base, integration and testing
- Incorporated LwIP network stack, USB stack, FatFS etc., GSM module to STM32H5 series

Senior Embedded Developer Heidelsoft Technologies Pvt. Ltd. Kochi
Feb 2024 – May 2025

Projects Handled

➢ **Power optimization of Raspberry PI(CM4)**
Customer: KWS Duration: Completed
Project Description:

- Customers are required to optimize the power consumption on RaspberryPi, by removing and disabling hardware as well as software components on RaspberryPi.

Responsibilities

- Removed unwanted network stack, WLAN, USB stack.
- Developed optimized kernel
- Device tree edited for disabling software components
- Measured and documented the drop in power consumption using type C tester (Makerfire).

➢ **BridgEth controller board powered by Raspberry Pi (CM4, RP2040).**
Customer: KWS Duration: Completed Development Tools: Visual Studio Code, FreeRTOS-Plus-TCP.
Languages: C (FreeRTOS).
Project Description:

BridgEth is a compact, modular industrial controller featuring Raspberry Pi CM4 and RP2040, tailored for Industry 4.0 and IIoT applications. It supports long-range SPE communication, versatile connectivity options including Ethernet, Wi-Fi, and MQTT.
Responsibilities:

State Machine Design and Implementation:

- Designed and implemented the state machine to manage module interactions and ensure reliable communication between BridgEth BASE and optional modules.
- Integrated the communication protocols for seamless data exchange over SPE and Ethernet.
- Developed robust protocols for DIN rail bus communication to ensure accurate data transfer and coordination between modules.
- Designed fault-tolerant mechanisms for network reliability over long distances.

FreeRTOS Framework Development:

- Developed and configured the FreeRTOS-Plus-TCP framework for real-time operation of the RP2040 controller.
- Implemented custom scheduling and resource management to optimize the performance of the industrial control system.
- Programmed the RP2040 controller for temperature sensing, digital pulse counting, and 24V/230V switching

➢ **EDDi – Controller for print into ePaper Displays powered by Raspberry Pi**

Customer: KWS Duration: Finished Development Tools: Visual Studio Code, FreeRTOS, TCP-IPP.

Languages: C (FreeRTOS). Python, Shell script.

Project Description:

- The EDDI Controller printing into ePaper Displays is an innovative industrial control solution developed by KWS Computer. This product combines cutting-edge technology with flexible functionality, making it suitable for various industrial applications.

Responsibilities:

- Designed and established IPP configurations
- Developed print settings by modifying configurations
- Used and customized Linux open printing support CUPS for project requirements.

➢ **USB2Ethernet using Customized PICO Board**

Customer: KWS Duration: completed Development Tools: Visual Studio Code, FreeRTOS.

Languages: C (FreeRTOS), Shell script.

Customized Raspberry Pico combined with LAN865x chip by Microchip to communicate between two hosts or nodes with Single pair ethernet

Responsibilities:

- Designed and developed the system to communicate between two nodes.
- Initiated the LAN chip and read the data coming from chip using SPI.
- Established connections between two PICO boards via SPE (Single pair ethernet)

Embedded Engineer   NeST Digital Pvt. Ltd. Kochi
                                                                   Aug 2022 – Jan 2024

Projects Handled

➢ **Yocto build**

Customer: POC Duration: Finished Development Tools: GEDIT, NANO

Languages: C, SHELL SCRIPT

To build a custom YOCTO build for IMX board which supports recipe for integrating temperature sensor

Responsibilities:

- Developed custom YOCTO image with inclusion of package to handle temperature measure by sensor
- Leart and gained experience in developing custom YOCTO images and distribution

➢ **Sensor Fusion – Integration of Radar and Camera sensor**

Customer: RNTBCI Duration: Finished Development Tools: Visual Studio Code, FreeRTOS,

TI Radar interface

Languages: C, Python

Responsibilities:

- Calibrated the sensor output with camera detected images
- Taken multiple builds with different configurations and tested for end functionality.

➢ **Accelerometer integration with STM32**

Customer: R&D project Duration: Finished Development Tools: STM32Cube IDE

Languages: C

Responsibilities:

- Integrated Accelerometer sensor ADXL345 with stm32 using I2C protocol
- Read roll pitch yaw data and angular velocity along 3 axis and parsed into json string for further use.

Academic Associate   IIM Calicut. Kochi- Campus

Nov 2021 – Jul 2022

Roles and Responsibilities

- Assisted professors in research activities and conducted administrative duties.
- Supported classroom management and facilitated academic programs.

Freelance Projects

- Due Date Defender (ESP32 Based project with NFC, Fingerprint sensor and TFT display integrated)
- Real-Time-controller-for-train-signal (STM32 based project)

Certifications

- Embedded Systems Bare-Metal Programming Ground Up^{TM} (STM32) – Udemy
- Software Development Life Cycle (SDLC) -LinkedIn learning
- Agile Software Development: Clean Coding Practices
- Git Essential Training: The Basics.
- Software Development Life Cycle (SDLC)- LinkedIn learning
- Model based design: Build Embedded Systems with Simulink

Extra curricular activities

- Club activities
- Swimming
- Travelling
- Listening to music.

Education

Master of Technology in Mechanical Engineering
Mechatronics and Manufacturing Systems Management
Kerala Technological University (APJKTU)
2019 – 2021   CGPA: 8.7

Bachelor of Technology in Mechanical Engineering
University of Calicut
2015 – 2018   CGPA: 7.24

Personal Details

- Marital Status: Single
- Date of Birth: 17/04/1997
- Native: Malappuram, Kerala.
- Willingness to relocate: YES (Bengaluru/ Kochi)
- PF: Currently No.

References

Available upon request.

Declaration

I hereby declare that the information furnished above is true to the best of my knowledge and belief.

Date: ARAVIND P V

Place: Pune