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SUMMARY

Accomplished Senior Lead Embedded Software Engineer with a strong background in firmware development for IoT devices using ESP32 and ESP8266 at Innotronix Labs & Trading Ltd. Proficient in Embedded C, with a proven ability to mentor junior engineers and foster cross-functional collaboration. Successful in implementing innovative solutions that enhance product functionality and reliability, with a focus on driving technological advancement.

EXPERIENCE

Senior Lead – Embedded Software Engineer
Innotronix Labs & Trading Ltd | Oct 2023 – Present

- Developed and deployed firmware solutions for IoT and embedded systems using ESP32/ESP8266 microcontrollers and the Arduino platform.
- Conducted Root Cause Analysis for software and hardware issues in existing products, including RPDU systems for BPCL, NAYARA, and IOCL petrol pumps, implementing code modifications to ensure proper functionality.
- Collaborated with cross-functional teams to deliver reliable and efficient firmware for retail and transportation applications.
- Utilized Git for version control and Jira for task tracking and project management, ensuring efficient collaboration and streamlined development workflows.

Assistant Professor
Bharati Vidyapeeth (Deemed to be University) College of Engineering | Oct 2010 – Oct 2023

- Mentored students in VLSI design, embedded systems, and programming languages such as VHDL, Embedded C, and Python.
- Supervised academic projects integrating VLSI, IoT, and Embedded Sytems (8051, PIC18F, ARM LPC2148).

SKILLS

- **Programming:** Embedded C, Assembly, VHDL, Verilog, Python, Core Java
- **Microcontrollers:** ESP32, ESP8266, 8051, PIC18F, ARM LPC2148
- **Communication Protocols:** RS485, I2C, SPI, Modbus, MQTT
- **Tools:** Arduino, PlatformIO, Xilinx ISE, Quartus Prime, MATLAB, Keil uVision, MPLAB, Git, Jira
- **Operating Systems/ RTOS:** Linux, Windows, FreeRTOS

EDUCATION

- M.Tech Electronics (Computer) | College of Engineering, Pune | 2013 | CGPA: 7.11
- B.Tech (Electronics & Communication Engineering) | Vignan's Engineering College, Vadlamudi | 2008 | 64%

ACHIEVEMENTS

- Successfully transitioned to the embedded systems industry after a 14-year academic career.
- Qualified GATE multiple times (2008, 2012, 2013, 2014).
- Received awards for academic excellence and cultural achievements.

LANGUAGES

- Fluent in English, Hindi, Telugu
- Conversational in Marathi.

PROJECTS

JioBP EPS System

- Designed firmware for Totem Controller (ESP32S3) and EPS modules for EPS (electronic price display) at retail outlets.
- Integrated and interfaced GLCD (128x64) with the Totem Controller, overcoming significant implementation challenges.

- Worked with DC voltage sensor, AC voltage sensor, RTC, temperature sensor and brightness sensor for comprehensive system monitoring and control.
- Used **FreeRTOS** features like mutex and pinned tasks to different cores for efficient task management and performance optimization.
- Implemented RF (LoRa) and RS485 communication for seamless data exchange.

PAPIS for Indian Railways

- Developed firmware for Side Destination Boards (128X16 P8 LED displays) to display train details.
- Supported multiple Indian languages for display on LED boards, enhancing accessibility and usability.
- Utilized ESP32S3 and Arduino for efficient LED control and dynamic updates.
- Used **FreeRTOS** features like mutex and pinned tasks to different cores for efficient task management and performance optimization.

HPCL RPDU System

- Created firmware for P10 LED displays (96x32) using ESP8266 for HPCL retail outlets RPDU (Rate Product Display Units).
- Supported multi-language scrolling, ESPNOW protocol, and RS485 communication.

NAYARA RPDU System

- Created firmware for P10 LED displays (96x32) and (80X32) using ESP8266 for NAYARA retail outlets RPDU (Rate Product Display Units).
- Supported multi-language scrolling, ESPNOW protocol, and RS485 communication.

IOCL RPDU System

- Created firmware for P10 LED displays (120x32) and (62X32) using ESP8266 for IOCL retail outlets RPDU (Rate Product Display Units).
- Supported multi-language scrolling, ESPNOW protocol, and RS485 communication.

3-Digit EPS System

- Developed firmware for seven-segment displays (ESP32S3) for Dubai-based clients.
- Enabled price and brightness updates via a web interface and RS485 protocol, ESPNOW protocol.

GNSS Based Time Display

- Developed firmware for time and date display using GNSS module and P10 DMDs (2x2 configuration).

- Time and date data were read serially from the GNSS module and displayed on synchronized LED panels.
- Implemented reliable serial communication for accurate and continuous real-time clock updates.

Air Quality Parameter Display (RGB)

- Developed a system to display real-time air quality parameters such as temperature, humidity, PM10, and PM2.5 AQI.
- Implemented dual data acquisition methods: serial data via Modbus protocol and API-based data fetching from provider servers.
- Designed two product variants — one with RGB P10 LEDs (6x4, 32x16 per P10) and another using monochrome P10 displays — offering flexible deployment options.
