



# RAHUL MALIK

## Embedded System Expert

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## JOB OBJECTIVE

Seeking a challenging role in the field of Embedded Systems, focusing on innovative product development and IoT solutions. Targeting positions in leading technology firms to leverage expertise in microcontrollers, industrial protocols, and wireless communication.

## CORE COMPETENCIES

- Product Architecture
- Benchmarking Strategies
- Firmware Optimization
- Wireless Connectivity
- IoT Integration
- Hardware Design Review
- System Design
- Project Management
- Mechanical Verification
- Firmware Integration

## EDUCATION

- B.Tech. in Electronics Engineering, Radha Govind Engineering College, Meerut, India (2012)
- XII from S. D. Public School, Muzaffarnagar, India (2008)
- X from S. D. Public School, Muzaffarnagar, India (2006)

## PROFILE SUMMARY

- **Team Lead** - Proven track record of **leading multi-disciplinary teams** across firmware, hardware and testing domains, ensuring timely and quality delivery of embedded solutions in critical safety and IoT applications.
- **Led weekly sync-up meetings** to identify cross-functional roadblocks early, enabling proactive risk mitigation and ensuring project timelines remained intact.
- Experienced professional with over a decade of expertise in developing products across **IoT, Asset Tracking, HVAC, and Home Automation domains**.
- Professional with strong technical acumen & problem solving & understanding of business operations, people management & handling cross functional teams.
- Building IOT products as finished good, with Deep expertise in firmware, hardware, connectivity technologies & partitioner in mechanical, software, edge computing & connectivity.
- Proficient in **C and assembly language**, showcasing expertise in firmware development and system integration.
- Recognized for **improving product performance** and connectivity by successfully implementing **OTA** (Over-the-Air) updates on various microcontroller families.
- Demonstrate expertise in **ensuring seamless communication in IoT devices** by utilizing industrial protocols like **MQTT** hosted over **AWS/Azure clouds**.
- Expert in **proprietary RF, Wi-Fi and BLE mesh** communication technologies, enabling reliable, scalable, and high-performance wireless network solutions.
- Possess strong theoretical knowledge of **CAN** with a solid understanding of their applications in embedded systems.
- Ability to **lead initiatives** and to coordinate several projects simultaneously
- Spearhead the development of **2G/4G/NB-IOT based Trackers**, ensuring secure data transmission to cloud platforms and enhancing connectivity.
- Proven track record of **designing and optimizing product architectures**, ensuring high performance and reliability.
- Proficient in **conducting benchmarking to optimize product performance** and competitiveness, utilizing in-depth knowledge of microcontrollers and wireless communication protocols.
- Proficient in using **ClickUp, Jira** for **project management**, effectively organizing tasks, tracking project timelines and collaborating across teams to ensure timely delivery of milestones.

## WORK EXPERIENCE

### Embedded System Engineer – MachineSens IOT Trading Co LLC. (Aug 25 - present)

#### Responsibilities:

- Designed and developed an edge-intelligent wireless mesh-based thermostat with integrated HMI, delivering advanced user interaction and energy-efficient control.
- Engineered a multi-functional SIL 2-compliant industrial I/O board supporting BMS connectivity via Modbus, LoRaWAN, RF Mesh, BLE Mesh and Wi-Fi, ensuring versatile system integration.
- Architected a battery-powered environmental monitoring solution for the pharmaceutical industry, enabling real-time temperature and humidity tracking over LoRaWAN with high reliability.

## TECHNICAL SKILLS

- **Languages:** C, assembly language.
- **Controllers:** 8-bit (8051, AVR & stm8s), 32-bit (LPC2148, stm32, nRF52840 & ESP32).
- **Protocols:** UART, CAN, RS232, RS485, SPI, I2C, TCP/IP, MODBUS, MQTT/ MQTTS, Wi-Fi, BLE mesh, ESP-NOW, LoRaWAN
- **Sensors Interfaced:** SDP810 (ADC), Bluetooth (HC-05), FPC1080 (SPI), RFID, DC/AC Motors, E-paper display (SPI), HDC1080 (I2C), CCS811 (I2C), SCD30 (I2C).
- **IDE's:** KEIL, Atmel studio, Labview, eclipse, ESP IDF, VS Code, STM32CubeIDE.
- **OS:** Linux, Windows, freeRTOS & Zephyr RTOS.
- **Version Control:** Git, Github.
- **Project Management:** ClickUp, Jira.

## PERSONAL DETAILS

**Date of Birth:** 25th June 1991

**Languages Known:** English and Hindi

**Address:** Flat 209, U-06, Italy Cluster, Dubai International City, Dubai, UAE

## PREVIOUS EXPERIENCE

### Manager - Jayanita Exports Pvt. Ltd. (Oct 2023 - Feb 2025)

#### Highlights:

- Led the development of an innovative, edge-intelligent wireless mesh-based blind solution, achieving human-like intelligence in navigation and functionality.
- Spearheading product architecture design and firmware development, ensuring optimal performance.
- Leading benchmarking activities, enhancing product competitiveness in the market.
- Verifying and validating schematics, guaranteeing product reliability.
- Coordinating cross-functional teams, ensuring seamless project implementation.
- Implementing a new firmware testing strategy that resulted in a **30% reduction in testing time**, streamlining the development process and ensuring faster time-to-market.

### Assistant Manager - Napino Digital Solutions Pvt. Ltd. (Dec 2021 - Oct 2023)

#### Highlights:

- Managed the design and integration of IoT products, focusing on smart tracking and environment monitoring.
- Contributed to the development of 2G/4G/NB-IOT based Trackers, enabling secure data communication.
- Conducted day-to-day project coordination, facilitating efficient team collaboration.
- Implemented product architecture as per customer requirements, ensuring alignment with project goals.
- Verified mechanical components for PCB and casing, ensuring product quality.
- Streamlined the firmware development process by introducing modular testing, resulting in a 25% decrease in bug identification time.
- Led the integration of IoT products with customer-specific requirements, resulting in an increase in customer satisfaction ratings.

### Product Manager (Instrumentation) - Caire Consult (Feb 2019 - Dec 2021)

#### Highlights:

- Designed and optimized the architecture for Variable Air Quality stations, meeting client specifications.
- Integrated firmware and conducted quality testing, ensuring product performance.
- Utilized MODBUS/BACnet over IP for wireless data transmission, enhancing system efficiency.
- Managed the development of advanced application-specific controllers, ensuring accurate airflow regulation.

### Sr. Embedded Engineer - Vedys Technologies Pvt. Ltd. (Dec 2017 - Feb 2019)

#### Highlights:

- Worked for Caire Consult during this tenure.
- Supported the design and development of Tap-based Lock with fingerprint sensor, ensuring secure access control.
- Implemented OTA on stm32 microcontrollers, enhancing device connectivity.
- Demonstrated expertise in industrial protocols like MODBUS, ensuring seamless data exchange.
- Led the integration of RF mesh-based Communication, optimizing wireless networks.

### Assistant Embedded Engineer - CETPA Infotech Pvt. Ltd. (Oct 2014 - May 2016)

#### Highlights:

- Worked on various 8 & 16 bit microcontrollers for the assigned projects.
- Verified schematics and PCB designs, guaranteeing product reliability.
- Collaborated with the quality department to conduct comprehensive testing, ensuring product functionality.

### Production Engineer - Victor Component Systems Pvt. Ltd. (Nov 2012 - Feb 2014)

#### Highlights:

- Managed production processes, ensuring timely delivery of finished goods.
- Optimized manufacturing operations, enhancing productivity and efficiency.
- Implemented quality control measures.
- Coordinated with cross-functional teams to meet production targets.

\*Refer to annexure for projects.

## ANNEXURE

### **Project 1: BLE Mesh-Enabled Smart Thermostat**

- Owned end-to-end development from PCB design and hardware bring-up to firmware delivery.
- Defined system architecture, covering communication flow, sensors, actuators, and power strategy.
- Built reliable firmware in Embedded C using Zephyr RTOS, ensuring accurate sensing and responsive control.
- Integrated BLE Mesh for extended range, multi-node coordination and seamless connectivity.
- Enabled OTA updates for rapid field improvements and maintenance.

### **Project 2: Mesh-Enabled Smart Blinds**

- Successfully leveraged embedded C and Nordic's SDK to develop robust firmware, guaranteeing seamless product functionality.
- Integrated Zephyr RTOS for efficient task management, enhancing system performance.
- Led development of innovative Blind communication system utilizing BLE mesh technology for seamless remote connectivity.
- Innovatively engineered blind solution equipped for Over-The-Air updates, seamlessly adapting to user preferences on demand. Proficient in stall detection, contributing to enhanced operational efficiency and system reliability

### **Project 3: Mesh-Enabled Smart Remotes**

- Successfully leveraged embedded C and Nordic's SDK to develop robust firmware, guaranteeing seamless product functionality.
- Expertly engineered seamless integration of I2C-based OLED interfacing with nRF52840, enhancing visual display functionality.
- Proficiently established and managed seamless communication with blinds utilizing BLE mesh network technology.
- Optimized communication via BLE-mesh for maximal battery efficiency, enhancing device longevity and performance.

### **Project 4: STEM (Smart Tracking & Environment Monitoring)**

- Developed IoT product for smart tracking and environment monitoring, enabling real-time data access.
- Implemented embedded C and ESP IDF for firmware development, ensuring product functionality.
- Integrated freeRTOS for efficient task management, enhancing system performance.
- Conducted product architecture designing, ensuring alignment with project objectives.
- Benchmarked IoT products, optimizing performance and reliability.

### **Project 5: Variable Air Quality station (VAQ) – Wire free**

- Designed architecture for wire-free airflow measuring station, ensuring accurate data transmission.
- Verified mechanical components for PCB and casing, guaranteeing product reliability.
- Integrated firmware for wireless data transmission, enhancing system efficiency.
- Provided test points for quality testing, ensuring product functionality.
- Collaborated with cross-functional teams to achieve project milestones.

### **Project 6: Variable Air Quality station (VAQ) – Wired**

- Developed wired airflow measuring station, ensuring seamless data transmission.
- Implemented MODBUS (RS485) for data exchange, enhancing system connectivity.
- Designed firmware for control damper regulation, ensuring optimal airflow management.
- Integrated firmware for product functionality, aligning with project requirements.
- Conducted quality testing, ensuring product reliability.

### **Project 7: Indore Air Quality (IAQ)**

- Created remote system for VAQs, utilizing e-paper display for user interface.
- Recorded environmental parameters using sensors like HDC1080 and CCS811, ensuring data accuracy.
- Designed algorithm for product functionality, meeting customer requirements.
- Integrated firmware for product operation, ensuring seamless user experience.
- Provided test points for quality assurance, guaranteeing product reliability.

### **Project 8: Tap based Lock with fingerprint sensor**

- Developed lock system with fingerprint sensor for secure access control.
- Implemented embedded C and Eclipse for firmware development, ensuring system functionality.
- Verified schematic and PCB designs, guaranteeing product reliability.
- Conducted firmware testing for lock and unlock mechanisms, enhancing user security.