

M AJAY

📍 Mahabubnagar, Telangana, INDIA ✉ ajay0704m@gmail.com ☎ 9550731366 🌐 in/ajay-mudhiraj-790b8a262

SUMMARY

Software Engineer Trainee with 6 months of experience in Embedded Systems and Firmware Development using Embedded C/C++ and STM32. Hands on experience in FreeRTOS, peripheral driver development, UART, SPI, I2C, DMA, ADC, PWM, and RFID communication protocols. Experienced in real-time embedded application development, debugging, and system validation with a focus on reliable and efficient firmware development.

EXPERIENCE

Software Engineer Trainee

NAV Tech Electronics India Pvt Ltd

November 2025 – Present, Hyderabad, India

- Developed embedded firmware for STM32-based systems using Embedded C/C++ and FreeRTOS.
- Implemented peripheral drivers and communication interfaces including UART, DMA, I2C, ADC, PWM, BLE, and RFID.
- Designed real-time applications involving RFID-based auto checkout, RTC time management, and actuator/motor control systems.
- Designed and optimized features such as EPC tag processing, PID-based motor control, CRC16 handling, and task synchronization using FreeRTOS queues and mutexes.
- Performed debugging, root cause analysis, and functional validation to improve system stability and performance.
- Supported production testing, hardware validation, and field troubleshooting for large-scale deployment of 1,675+ hardware boards.

PROJECT

Air Management System (AMS)

- Implemented I2C driver to interface STM32L0 with RV3028 RTC.
- Developed register-level read/write and BCD conversion logic for RTC data handling.
- Built RTC module for time management (get/set time) in embedded C.
- Performed functional testing and validation of AMS controllers to ensure reliable system operation.
- Debugged and resolved high power consumption issue caused by faulty switch behavior, improving system efficiency.

Golf Simulator Tee

- Developed STM32 firmware using Embedded C and FreeRTOS for real-time actuator control.
- Implemented PWM-based bidirectional motor control with PID-based position adjustment for precise tee height movement.
- Developed ADC-based actuator position feedback and calibration logic for accurate actuator movement.
- Integrated queue-based command handling and real-time monitoring for actuator operations.
- Performed system debugging, hardware validation, and integration testing for actuator, WiFi, and BLE modules.

Auto Checkout

- Developed real-time embedded firmware for a dual UHF RFID automated checkout system using STM32 and FreeRTOS.
- Implemented UART/DMA communication, EPC tag parsing, RSSI filtering, CRC16 handling, and RFID inventory tracking.
- Designed state-machine-based firmware with thermal failover and thread-safe task synchronization using FreeRTOS queues and mutexes.
- Performed system testing, debugging, root cause analysis, and validation to improve reliability and performance.

Outlet Management System (OMS)

- Executed end-to-end testing and validation of OMS controllers to ensure reliable system performance, functionality, and communication stability.
- Identified and diagnosed controller-level issues, functional defects, and communication failures during testing.
- Conducted on-site troubleshooting and field validation to identify the reasons for frequent offline nodes, improving overall system uptime and network reliability.
- Supported production and quality validation of 1,675 hardware boards for large-scale deployment and field implementation.
- Performed production testing and hardware verification to ensure board-level quality, reliability, and deployment readiness.

Design and Analysis of RF MEMS SWITCH

- Developed analytical models and simulation workflows to evaluate key parameters such as pull-in voltage, capacitance ratio, switching time, and mechanical stress.
- Performed simulation and optimization using COMSOL Multiphysics and HFSS for electromechanical behavior and RF performance analysis.
- Optimized structural parameters including serpentine meander beams, perforation geometry, and dielectric thickness to improve switch performance.
- Achieved an optimized design with 3.1 V pull-in voltage, 697 capacitance ratio, and 4.4 μ s switching time for low-power, high-speed applications.
- Published research paper in IJMOT (2026) on RF MEMS switch analytical modeling and performance optimization.

EDUCATION

Electronics and Communication Engineering (ECE)

Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering and Technology (VNRVJIET) • Hyderabad • 2021-2025 • 8.75/10

Intermediate (IPE)

Rishi Junior College • Mahabubnagar • 2019-2021 • 970/1000

Secondary School Education (SSC)

Mahabubnagar Grammar School • Mahabubnagar • 2018-2019 • 9.7/10

CERTIFICATIONS

Two-day Workshop on Basic PCB Designing

TECHNOTRAN

• Gaining hands-on experience in schematic generation, layout design, and PCB manufacturing, as well as a certification in PCB design fundamentals through the Technotron.

Drone Simulation and Assembling

Pavaman Aviation

• Gaining hands-on experience in drone simulation and assembling, as well as a certification in Drone simulation fundamentals through Pavaman Aviation

SKILLS

Technical Skills: Embedded C, C++.

Embedded Systems: STM32CubeIDE, Peripheral Drivers (GPIO, UART, SPI, I2C), RTOS basics.

Simulaton Tools: COMSOL Multiphysics.
