

SURYA TEJ

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SUMMARY

Embedded Software Developer with hands-on experience in IoT, RTOS, and smart home automation using ESP32, ESP8266, and Nuvoton microcontrollers. Worked on firmware for Wi-Fi-based smart switches and dimming controllers supporting Phase-Cut, PWM, DALI, and Analog dimming techniques. Currently working on an IoT Hub using Matter Protocol for integration with Alexa, Siri, and Google Assistant devices. Also worked on the PAT IoT Solutions website, including UI updates and deployment using Claude AI. Smart India Hackathon 2023 Finalist and selected for Grand Contest 2024 for a LiDAR-enabled smartwatch for the visually impaired.

TECHNICAL SKILLS

Project & Workflow Management: Embedded Firmware Development, IoT Integration, Smart Home Automation, Hardware-Software Integration, Debugging, Agile Workflow, Git/GitHub, System Testing, Technical Documentation.

Data & Decision Making: System Analysis, Debugging, Performance Optimization, Testing, Troubleshooting, Real-Time Monitoring, Network Analysis.

Design & Research Tools: System Design, Circuit Debugging, Prototyping, Hardware Testing, Technical Research, Embedded System Analysis.

Programming & Tech Stack: C, C++, Python, HTML, CSS, Embedded C, ESP32, ESP8266, Nuvoton MS51, RTOS, Arduino IDE, PlatformIO, Git/GitHub, IoT Protocols.

EXPERIENCE

PAT IoT Solutions

Embedded Software Developer

Hyderabad, India
Sep 2025 – Present

- Working on end-to-end embedded firmware development for smart home automation products using ESP32, ESP8266, and Nuvoton microcontrollers.
- Developing Wi-Fi-enabled smart switches and dimming controller solutions supporting Phase-Cut, PWM, DALI, and Analog dimming techniques for lighting automation systems.
- Building an IoT Hub using the Matter Protocol to enable seamless communication between home automation devices and voice assistants like Alexa, Siri, and Google Assistant.
- Implementing RTOS-based embedded architectures, communication protocols, and device integration workflows for scalable IoT systems.
- Working on firmware debugging, hardware-software integration, and real-time device communication for automation products.
- Contributed beyond embedded development by designing and deploying the PAT IoT Solutions website using Claude AI for UI development, deployment, and workflow integration.
- Collaborating with hardware, firmware, and product teams to develop reliable connected automation solutions for production environments.

CSR Electronologies

Firmware Engineer Intern

Hyderabad, India
May 2025 – Sep 2025

- Worked on embedded firmware and RTOS-based IoT projects using ESP32, ESP8266, and microcontroller-based systems.
- Developed firmware for smart home automation devices, including Wi-Fi-enabled switches and real-time control systems.
- Implemented communication interfaces and peripheral integration using UART, I2C, SPI, and GPIO-based modules.
- Worked on RTOS task management, device scheduling, and real-time embedded application development.
- Assisted in developing and testing automation workflows for connected IoT devices and embedded control systems.
- Worked with Arduino IDE, PlatformIO, and embedded development tools for firmware build, testing, and deployment.
- Collaborated with hardware and firmware teams during prototyping, integration, and validation phases of development.
- Gained hands-on experience in embedded system architecture, communication protocols, and IoT product development workflows.

PROJECTS

Smart Home Automation & IoT Hub — ESP32, ESP8266, Nuvoton, RTOS, Matter Protocol 2025- Present

- Developing smart home automation systems using ESP32, ESP8266, and Nuvoton microcontrollers.
- Built firmware for Wi-Fi-enabled smart switches and dimming controllers supporting Phase-Cut, PWM, DALI, and Analog dimming techniques.
- Developing an IoT Hub using the Matter Protocol for seamless communication with AI assistants like Alexa, Siri, and Google Assistant.
- Working on RTOS-based communication, device integration, and embedded system architecture for scalable IoT ecosystems.

PAT IoT Solutions Website — HTML, CSS, Deployment April 2026

- Designed and deployed the [PAT IoT Solutions website](#) using Claude AI beyond core embedded development responsibilities.
- Worked on responsive UI implementation, deployment workflows, and website integration.
- Assisted in structuring product and company information for better user experience and accessibility.
- Worked on deployment optimisation and frontend workflow improvements for production use.
- Collaborated on integrating modern design elements and responsive layouts for cross-platform compatibility.

Smart and Sustainable Surveillance — Python, OpenCV, YOLO March 2024

- Developed a smart surveillance system with object detection, face recognition, and motion detection capabilities.
- Integrated OpenCV, YOLO, and multiple datasets for real-time monitoring and detection.
- Built a monitoring interface for surveillance visualisation and event tracking.
- Implemented real-time webcam and CCTV-based object detection workflows.
- Improved automation and monitoring efficiency through AI-assisted surveillance techniques.

FQ-CoDel-Based Scheduling for IoT Traffic in WiFi Networks — NS-3 Simulator April 2025

- Designed and implemented fair-queuing-based congestion control for IoT traffic in WiFi networks.
- Used the FQ-CoDel algorithm to improve traffic prioritisation and network efficiency for IoT devices.
- Simulated and analyzed network performance using NS-3 and NetAnim.
- Evaluated latency, throughput, and congestion behaviour under different network conditions.
- Worked on optimising queue management techniques for stable IoT communication performance.

Smart Microgrid as a Service — Python, Machine Learning | Smart India Hackathon 2023 Finalist December 2023

- Developed a system for efficient energy generation, monitoring, and consumption management.
- Implemented real-time monitoring and analytics to optimise power usage and efficiency.
- Designed a platform to monitor power generation, distribution, and consumption patterns.
- Built user-oriented monitoring features to provide efficient energy usage suggestions.
- Led the project as Team Leader during Smart India Hackathon 2023 and coordinated development workflows.

ACHIEVEMENTS

- Smart India Hackathon 2023 Finalist and Team Leader for Smart Microgrid as a Service.
- Selected for Grand Contest 2024 for the LiDAR-enabled smartwatch for the visually impaired.
- Participated in IDE Bootcamp 2024 at the National Institute of Technology, Goa.
- Participated in the Outreach Program on AI & ML in IoT and Its Applications at the National Institute of Technology, Warangal.
- Technical Event Organiser for Sumshodhini'24 at KITS Warangal.

EDUCATION

Kakatiya Institute of Technology and Science

B.Tech in Computer Science Engineering (Internet of Things) — CGPA: 7.03/10

Warangal, India

Nov 2021 – 2025