Lohitha Lakshmi Guggilam

Embedded Software Engineer | Electronics Design Engineer

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Summary

Electronics and Embedded Design Engineer with 3+ years of experience, *working across embedded software development, PCB design, and system-level hardware integration. Holding a Master's degree in Embedded Systems Engineering and a strong academic foundation in Electronics and Communication Engineering, which has enabled to build solid expertise across multiple technical domains. Honed with skills in programming languages, microcontrollers, signal processing, precision measurement design, Embedded GUI development, low power design and secure embedded application development.*

Education

MSc Embedded Systems Engineering *Sep 2022 – Nov 2023*
University of Leeds | Leeds, UK
Grade: *First class with Distinction*
Dissertation: *Quantum Networks (Quantum networks and quantum-enabled embedded communication system)*

B. Tech Electronics and Communication Engineering *Jun 2017 – Jun 2021*
GITAM Deemed to be University | Hyderabad, India
Grade: *First class with Distinction (9.18/10.0)*
Dissertation: *Design of Text to Braille Converter (Electronic refreshable cell Unit implementing Braille script)*

Experience

Electronics/Embedded Design Engineer *May 2024 – Present*
Trumeter | Manchester, United Kingdom

- *Optimized smart meter and precision measurement systems for high accuracy and real-time data acquisition, improving reliability, signal integrity, and overall product performance.*
- *Designed and developed secure embedded web servers for product family lines, enabling remote configuration, monitoring, and diagnostics, TLS/SSL encryption and session management to protect device configurations and sensitive telemetry data.*
- *Researched, evaluated, and integrated industrial communication protocols including HART and IO-Link, contributing to new product variants and enhanced interoperability in industrial automation environments.*
- *Designed, developed, and prototyped embedded systems using Renesas RA6M3 microcontrollers with Azure ThreadX RTOS, implementing multitasking, peripheral drivers, and real-time scheduling.*
- *Designed schematics and multilayer PCBs using Proteus, and performed layout analysis with Saturn PCB Design Toolkit, adhering to IEC 62368-1 safety requirements and ISO 9001 quality standards.*
- *Developed a scalable calibration system for new products, implementing automated sweep and verification mechanisms to support future product families and manufacturing expansion.*
- *Performed hardware validation and EMC testing in compliance with IEC 61000-4-x standards, ensuring electromagnetic compatibility, noise immunity, and functional robustness.*

Embedded System Engineer *Jan 2024 – Apr 2024*
Manulytica | Leeds, United Kingdom

- *Developed edge-based machine learning models using NanoEdge AI to enable predictive maintenance by detecting micro-level performance deviations in industrial machines.*
- *Architected low-latency, fault-tolerant communication stacks using Zephyr RTOS, DECT NR+, and DDS-XRCE, ensuring reliable real-time data exchange in industrial IoT environments.*
- *Developed custom embedded drivers for sensors, enabling integration with cloud analytics.*
- *Developed low-power PCB in Altium, optimizing for minimal energy consumption in remote monitoring applications.*

Application Development Associate *Jun 2021 – Jul 2022*
Accenture | Hyderabad, India

- *Contributed to the design and development of three banking software products in Java, customized to align the requirements of the organization*
- *Formulated application production releases, crafting deployment strategies and schedules to ensure optimal efficiency*
- *Proactively coordinated the resolution of defects and performance issues and fostered continuous improvement initiatives*

Intern *Jun 2019 – Jul 2019*

Tech Mahindra | Hyderabad, India

- *Designed a Semi Home Automation system using 8051 microcontroller.*
- *Implemented external RAM and ROM interfacing, showcasing a comprehensive understanding of memory management.*
- *Successfully interfaced motor drivers, along with DTMF (Dual-Tone Multi-Frequency), ADC (Analog-to-Digital Converter) and LCD interfacing.*

Skills

Programming Languages and HDL: *C, Embedded C, Verilog, C++, Java, Python, Lua, HTML, CSS, JavaScript, Node.js*

Embedded Systems and Concepts: *Embedded Systems (HW/SW co-design, full lifecycle), Embedded Linux, Real-Time Operating Systems (RTOS), Bare Metal, FPGA, Microcontrollers/SoCs, PCB Design, Firmware, BSP Development, Secure Embedded Development, Cryptography and Security, Device Driver Development, DSP, Low Power Design, Debugging, Secure Web Development, Cryptographic Libraries (mbedTLS, OpenSSL), Certificate Management, Web Security, PKI Infrastructure, Firmware Security*

Communication Protocols: *UART, SPI, I2C, CAN, Modbus TCP, Modbus RTU, IO-Link, HART, Ethernet, USB, LoRaWAN (Foundational Knowledge)*

Microcontrollers and SoCs: *8051/8052, ARM Cortex-M (STM32, Nordic nRF52/nRF9160, Renesas RA6/RA4), ESP32*

Development Boards: *STM32 Nucleo, STM32 Discovery, Arduino Uno, Raspberry Pi, Thingy:52, nRF9160 DK*

Development Tools and Platforms: *Keil uVision 5, STM32CubeIDE, E2studio, Eclipse IDEs, NodeRED, Azure ThreadX, FreeRTOS, Zephyr, Contiki, ModelSim, NetSquid, Cooja, Altium Designer, Proteus, TouchGFX, Crank Storyboard, MATLAB/Simulink, LTSpice, LabVIEW, Digilent WaveForms, Saturn PCB, Git/GitHub/GitLab, Yocto Project, Docker, NanoEdge AI Studio*

Soft Skills and Productivity: *Technical Leadership (cross-functional teams, mentoring juniors), Problem-Solving, Technical Documentation (Doxygen), Product Data Management (Infor Syteline), MS Office 365*

Personal Projects

Morse Code Encoder Decoder

- *Designed and implemented a Morse Code Encoder-Decoder in C on an embedded board DE1 Soc.*
- *Developed custom driver files for the encode module, decode module, LEDs, switches, keys, timers, and other components to increase functional modularity.*
- *Used a single push button to input Morse code and displayed the decoded message on the LCD display. Additionally, the deciphered message is visually represented in Morse code on an LED along with the audio based on WM8731 audio chip.*

Highway Accident Detection and Alert System

- *Developed a real-time accident detection system for highways using Arduino and MPU-6050 accelerometer to detect collision intensity.*
- *Incorporated GPS and GSM modules to automatically transmit accident location data to predefined emergency contacts or control centers.*
- *Implemented event-driven data acquisition and threshold-based logic to minimize false triggers while ensuring immediate system response.*
- *Designed onboard indicator LEDs and LCD display for vehicle status feedback and post-event diagnostics.*

Emotion-Aware Ambient Lighting System

- *Developed an embedded system capable of detecting emotional cues from voice features such as pitch and energy using real-time signal processing.*
- *Deployed a lightweight TinyML model on a ESP32 S3 to classify emotional states without cloud dependency.*
- *Dynamically controlled RGB lighting patterns to adapt indoor ambience based on detected emotional context.*

Professional Affiliations & Languages

Professional Affiliations: *The Institution of Engineering and Technology (IET / MIET) (Pursuing CEng)*

Languages: *English (fluent), Hindi (conversational), Japanese (Beginner), Telugu (native)*