

Raghu Dharmana

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Professional Summary

Embedded Software Engineer with 7+ years of professional experience, including 2 years specializing in embedded software development for motor control and real-time systems, and 5 years in Electro-mechanical & instrumentation systems. Proficient in C language, FreeRTOS, communication protocols. Experienced with device drivers, hardware-software integration, and system-level debugging. Familiar with Linux Systems Programming. Background in hardware and instrumentation enhances ability to deliver reliable, end-to-end embedded solutions.

Skills

- **Programming language & OS:** Embedded C, FreeRTOS, Linux, Windows
- **Motor Control:** PMSM/BLDC, induction motors, FOC, Position Control, Safety-Critical Systems, sensed & sensor less
- **Protocols:** CAN, SPI, UART, HART
- **Tools & IDEs:** TI CCS, MATLAB/Simulink, STM32CubeIDE, STM Motor Control Workbench, VS Code, NXP S32 design studio
- **Debugging & Interface:** JTAG/SWD, Oscilloscopes, Logic Analyzers, Power Supplies, Function Generators

Experience

Project Engineer – Embedded Systems, CDAC Hyderabad Oct 2023 – Present

- Designed, developed, and implemented firmware and application software for PMSM motor control, including advanced algorithms (FOC, SVPWM) for precise torque, speed, and position control.
- Explored system requirements and defined software and electrical architecture for the tractor auto-steer system, integrating diverse motor drivers, sensors, and microcontroller platforms (TI, STM, NXP).
- Developed and optimized SPI drivers, configured PWM generation, synchronized ADC sampling, and managed memory allocation using linker command files.
- Integrated communication protocols (CAN, SPI, UART) and implemented safety/protection features (over-current, over-voltage, thermal monitoring) aligned with ISO 26262 standards.
- Conducted low-level debugging and verification using JTAG, oscilloscopes, and logic analyzers to ensure accurate sensor readings and actuator responses.
- Performed SIL/HIL, lab, and multiple field trials under diverse environmental and load conditions to validate system robustness, safety, and repeatability.
- Documented software architecture, calibration sequences, test procedures, and trial results. collaborated with cross-functional teams for seamless system integration.

Service Engineer – Instrumentation & Electro-Mech Systems, Pune Instrumentation Pvt Ltd Jul 2020 – Mar 2023

- Installed, calibrated, and maintained level and temperature control instrumentation across multiple sites.
- Diagnosed and troubleshoot hardware and software faults, including signal noise, grounding, and sensor errors, restoring systems to full operation with minimal downtime.
- Managed inventory, spares, and procurement using SAP MM, optimizing service response and equipment uptime.
- Supported instrumentation projects aligned with MIL-STD-1553 defense and industrial standards, contributing to project planning, documentation, and quality assurance.

- Assisted in commissioning new instrumentation setups and trained client staff on operational and safety procedures.

Assistant Systems Engineer, ADR Engineering Enterprises

Dec 2017 – Jun 2020

- Diagnosed and repaired sensor and valve control systems in hydraulic and electro-mechanical setups, improving system reliability and performance.
- Conducted functional and integration tests for feedback-based controllers on valves and pumps, ensuring precise control and minimal error.
- Assisted in installation, calibration, and maintenance of instrumentation and control systems across customer sites.
- Provided technical support and troubleshooting guidance to clients, improving response times and satisfaction.
- Documented system configurations, repairs, and troubleshooting procedures for internal records and client reference.

Education

PG Diploma in Embedded Systems , CDAC Hyderabad	2023
B.Tech in Electrical & Electronics Engineering , Chaitanya Engineering College	2017
Diploma in Electrical & Electronics Engineering , Govt. Polytechnic Vizag	2014

Certifications

IIT Madras – Motors and Controllers	2024
Cisco – Networking Devices and Initial Configuration	2023
SAP MM - SAPMaterial Management Certification , ACTS Chennai	2022