

KISHAN SOYA

Embedded Software Engineer

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SUMMARY

Embedded Software Engineer with 1.5+ years of experience developing real-time, register-level firmware for ARM7 (LPC2129) microcontrollers using Bare-Metal C and Embedded C, alongside hands-on Linux kernel module development. Built a custom Linux Character Device Driver implementing file operations, wait-queue based blocking I/O, and mutex-protected concurrent access. Skilled in peripheral driver development (UART, SPI, I2C, CAN, ADC, Timers, GPIO), interrupt-driven communication, and ISR-level root-cause debugging across production firmware. Seeking a Firmware / Embedded Linux Engineer role applying driver-development and kernel-level systems experience.

TECHNICAL SKILLS

Languages: C, C++, Embedded C

Bare-Metal: Register-level programming, Memory-Mapped I/O, Startup Code, Peripheral Drivers

Peripherals & Protocols: UART, SPI, I2C, CAN, GPIO, ADC, PWM, Timers

RTOS : RTX RTOS

Real-Time & Interrupts: NVIC, ISR Optimization, Low-Latency Design, Deterministic Execution

Linux Systems Programming: POSIX Threads (pthreads), Process Management, Memory Management, Scheduling Policies, Signal Handling, Pipes, Shared Memory, Message Queues, Semaphores

Networking : TCP/IP, UDP, TLS, DHCP, Socket Programming

Experience

Meliorates Technologies Pvt. Ltd.

Jul 2025 – May 2026

Embedded Engineer

Gandhidham, Gujarat

- Developed and maintained bare-metal firmware in Embedded C for microcontroller-based systems, covering peripheral drivers and application-level control logic.
- Implemented and integrated peripheral drivers for UART, SPI, I2C, and GPIO interfaces, enabling reliable communication between microcontroller and external hardware components.
- Root-caused and resolved 20+ firmware defects through code-level log analysis and step-by-step ISR tracing, improving stability across multiple releases.
- Designed and executed functional and boundary-condition test cases across varied input scenarios to validate firmware correctness before release.
- Analyzed existing firmware codebases to map control flow, ISR behavior, and timing constraints, reducing time-to-diagnosis on new issues.
- Supported hardware bring-up activities by validating GPIO, UART, SPI, and I2C peripheral functionality on new microcontroller boards.

Meliorates Technologies Pvt. Ltd.

Jan 2025 – Jun 2025

Embedded Intern

Gandhidham, Gujarat

- Studied interrupt-driven programming concepts and implemented sample ISR routines to understand timer and peripheral interrupt handling.
- Assisted senior engineers in debugging firmware issues by reviewing code logic and observing ISR execution using basic debugging tools.
- Executed basic firmware test cases under supervision to validate functional behavior of microcontroller-based training projects.
- Gained exposure to firmware development workflows, version control practices, and coding standards followed within the embedded team.

PROJECTS

Linux Character Device Driver (Loadable Kernel Module)

- Developed a Linux Character Device Driver as a Loadable Kernel Module to enable communication between user space and kernel space.
- Registered a character device dynamically using `alloc_chrdev_region()` and `cdev`, and created the corresponding device node under `/dev`.
- Implemented core `file_operations` callbacks (`open`, `read`, `write`, `release`, `llseek`) to support user-space interaction.
- Implemented a dynamically allocated kernel buffer using `kmalloc()` and `kfree()` for data storage.
- Used mutex synchronization to protect shared resources from concurrent access.
- Tested and debugged the driver using user-space applications, `printf()`, and `dmesg`.

TLS-Enabled Secure Client-Server Communication using OpenSSL

- Developed a secure client-server application in C on Linux using TCP sockets and OpenSSL to implement encrypted TLS-based communication.
- Implemented TLS handshake, certificate loading, and secure data exchange using `SSL_connect()`, `SSL_accept()`, `SSL_read()`, and `SSL_write()` APIs.
- Designed socket-based network programming logic in C to establish reliable client-server connectivity over TCP/IP protocol.
- Integrated OpenSSL library functions to enable certificate-based authentication and encrypted data transmission between client and server.

Multi-Protocol Communication Gateway for Real-Time Device Monitoring

- Developed embedded firmware in C/Embedded C for an Industrial Edge Gateway enabling real-time communication between field devices using UART, SPI, I2C, and CAN protocols.
- Designed and integrated interrupt-driven peripheral drivers with circular buffer and queue management to ensure reliable, low-latency data acquisition from multiple communication interfaces.
- Implemented a Communication Manager for packet parsing, message routing, CRC validation, timeout handling, and priority-based processing of data received from heterogeneous devices.

Memory Management Simulator in C (Paging and Page Replacement)

- Built a virtual-to-physical address translation simulator using a configurable paging scheme.
- Implemented page hit/miss detection, frame allocation, and dirty-page write-back logic to minimize unnecessary disk I/O.
- Modeled address translation by decomposing memory addresses into page numbers and offsets for a working OS-level simulation.

CERTIFICATION

Emertxe Information Technologies
Advanced Embedded Systems Program

Dec 2023 – Oct 2024
Bangalore, India

EDUCATION

BVM Engineering College
B.Tech (Electrical Engineering)

Aug 2019 – Jul 2023
CGPA: 8.21/10