AMAN MAKWANA

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SUMMARY

Embedded Firmware Engineer with hands-on experience in developing real-time applications on ARM microcontrollers. Skilled in Embedded C and low-level peripheral driver development including GPIO, UART, SPI, I2C, ADC, PWM, and Timers. Strong understanding of Linux fundamentals including process management, memory management, scheduling, interrupts, and IPC mechanisms.

TECHNICAL SKILLS

Programming	C, Embedded C
Microcontrollers	LPC2129 (ARM7)
Peripherals	GPIO, UART, SPI, I2C, ADC, PWM, Timers, Interrupts
RTOS	Basics of RTOS concepts
Linux	Process Management, Memory Management, File Management, Signal Management Scheduling Policies, IPC, Semaphore, Pipe, Message Queues, Shared Memory

EXPERIENCE

Junior Embedded Software Engineer Feb 2025 – Mar 2026
Safal Embedded Solution

- Gained hands-on experience working with Embedded C firmware code and improving existing implementations.
- Analyzed embedded source code to understand control flow, interrupt service routines (ISR), and task execution logic.
- Investigated and resolved runtime issues using log analysis, step-by-step debugging, and systematic code tracing.
- Reviewed firmware modules to understand how components interact within embedded software architecture.
- Tested firmware behavior using various input scenarios and edge cases to ensure stability and correctness.
- Studied communication interfaces such as UART, SPI, and I2C at code level to understand configuration and usage.
- Collaborated with team members to analyze reported issues and verify fixes in updated firmware builds.

Embedded Trainee Jun 2024 – Jan 2025
EMERTXE

- Worked with ARM-based microcontrollers for GPIO, timers, and interrupt handling.
- Implemented and tested serial communication protocols such as UART, SPI, and I2C.
- Completed hands-on training in Embedded C focusing on memory management, pointers, bitwise operations, and interrupts.
- Practiced bit manipulation techniques for register configuration.
- Gained understanding of Linux OS fundamentals including processes, signals, file systems, and IPC mechanisms.
- Studied process scheduling and context switching fundamentals in Linux.
- Explored Linux IPC mechanisms including pipes and message queues through hands-on examples.

PROJECTS

Custom Linux Shell Implementation in C

- Designed and implemented a custom Unix-like shell in C supporting command execution and built-in commands.
- Implemented multi-stage pipelines using pipe(), fork(), dup2(), and execvp() similar to Bash.
- Managed process creation and synchronization using fork() and wait().
- Demonstrated file descriptor manipulation, I/O redirection, and inter-process communication.

ARM-Based ADC Data Acquisition via SPI

- Interfaced external ADC with microcontroller using SPI protocol for real-time data acquisition.
- Handled GPIO configuration for SPI lines (MOSI, MISO, SCK, CS).
- Ensured proper synchronization between ADC sampling and LCD updates.
- Configured GPIO and peripheral registers for hardware-level communication.

ARM-Based Intelligent Automotive ECU Communication Framework Using CAN Bus

- Developed firmware for real-time multi-node ECU communication using CAN protocol.
- Configured CAN Acceptance Filter (AF) settings for selective message reception and optimized bus load.
- Ensured low-latency, reliable communication with error detection and message prioritization..

C Preprocessor Implementation using C

- Developed a C program to simulate the functionality of a C preprocessor by handling source code before compilation.
- Implemented support for macro expansion, header file inclusion, and comment removal.
- Demonstrated understanding of compiler design concepts and preprocessing stages of the C compilation process.

EDUCATION

B.Tech in Electronics and Communication Engineering Aug 2020 – May 2024
Gujarat Technological University, Ahmedabad
CGPA: 8.65

Class XII Jun 2019 – May 2020
Anand Niketan School
Percentage: 75%

Class X Jun 2017 – May 2018
Anand Niketan School
Percentage: 80%

CERTIFICATIONS

- Embedded Systems
- C Language
- Microcontroller Interfacing
- Microprocessor Basics
- Arduino Programming