

## Vasana Kusuma

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### EXPERIENCE SUMMARY

**Now:** Mirafra Software Technologies, Hyderabad, Software Engineer I, 19<sup>th</sup> June 2025-Present.

**Past:** Completed Advanced Embedded Systems Course at Vector India Pvt Ltd. (0.6Years)

### SKILLS

- **Programming Languages:** C, Embedded C, Data structures, C++.
- **Microcontrollers/SOCs:** LPC2129 (ARM7 TDMI-S core)
- **Tools & Technologies:** Keil  $\mu$ Vision.
- **Bus Protocols:** UART, I2C, SPI, CAN.
- **Operating Systems:** Linux (System Programming).
- **Tools:** Keil uVision

#### **Linux Kernel and Driver Development:**

- Character device drivers, (Registering the device, Data Transfer through IOCTL, File Operations).
- Platform Drivers and Device Tree configuration/integration
- Interrupt Handling using Workqueues, Tasklets, and Kernel Threads
- Kernel Memory Management (kmalloc, vmalloc)
- Experience in Kernel Bring-up using Yocto on Raspberry Pi.
- Hands-on with U-Boot environment variables for kernel and DTB loading.
- Kernel Boot Time Optimization and Performance Tuning using ftrace, meminfo and rootfs analysis.

#### **Android Framework**

- Basic understanding of Android Framework architecture.

### PROJECTS

#### **Kernel-Level Multi-System Game Interface Using UART, I2C OLED, and ALSA Audio**

**Role:** Embedded Linux Kernel Developer

#### **Responsibilities & Contributions:**

- Developed keyboard interrupt handlers (IRQ 1) to capture real-time user input and transmit actions via TCP sockets for inter-system multiplayer communication.
- Designed and integrated a custom UART kernel driver on Raspberry Pi to receive game data, parse user guesses, and trigger responsive system events.
- Implemented I<sup>2</sup>C OLED display interface at kernel level for real-time game prompts, ensuring smooth user feedback and low-latency display updates.
- Integrated ALSA to provide audio feedback (win/lose messages) from the kernel
- Managed kernel-level resource allocation (interrupts, memory, I/O) to optimize system stability and performance.

### Tools & Technologies Used:

- Languages: C (Kernel-space programming)
- Kernel Subsystems: Input, UART (TTY), I<sup>2</sup>C, ALSA Audio, Networking (TCP Sockets)
- Hardware: Raspberry Pi, I<sup>2</sup>C OLED Display.

### Data-Driven Vehicle Control Using CAN Protocol

- Designed and implemented an embedded multi-node vehicle control system using LPC2129 microcontroller and CAN bus protocol.
- Engine temperature monitoring using DS18B20 sensor, with real-time display on 16x2 LCD.
- Reverse alert system using GP2D12 IR distance sensor, LEDs, and buzzer for obstacle detection.
- Window control unit using switches and CAN communication for distributed actuation.
- Built multi-node CAN communication between Main Controller, Reverse Alert Node, and Window Control Node, ensuring reliable data exchange and fault tolerance.

**Tools & Technologies:** LPC2129 (ARM7 TDMI-S) microcontroller, DS18B20 sensors, GP2D12 IR sensor, LCD, keypad, LEDs, buzzer, switches, Keil uVision, Proteus, Flash Magic.

### Medicine Reminder System

- Designed and implemented a real-time embedded reminder system using RTC (DS1307), 16x2 LCD, keypad, and buzzer on LPC2129 microcontroller.
- Programmed in Embedded C to schedule and trigger medicine alerts at multiple user-defined times.
- Developed keypad interface for user input of medicine schedules, with LCD-based interactive menu navigation. Integrated buzzer and display alerts for timely reminders, ensuring ease of use for patients.

### Railway Ticket Management Using Linked Lists & File Handling

- Developed a C-based ticket booking application with features like user sign-up/sign-in, ticket booking, cancellation, and train information lookup.
- Designed using structures, singly linked lists (SLL), and dynamic memory allocation to manage passenger and train records efficiently.

## ACADEMIC CREDENTIALS

**Sri Vasavi Institute of Engineering and Technology, Nandamuru – 521369**

B. Tech in ECE      **Duration:** 2021 – 2024      **CGPA:** 8.34 / 10.0

**Sri Vasavi Institute of Engineering and Technology, Nandamuru – 521369**

Diploma      **Duration:** 2018 – 2021      **Percentage:** 96%

**Z.P. High School, Mallavolu – 521149**

SSC      **Year:** 2018      **Percentage:** 93%

## PROFESSIONAL TRAINING

- Embedded Systems Course, Vector India Hyderabad (September 2024-May 2025)