mirafra
TECHNOLOGIES

Vasana Kusuma

EXPERIENCE SUMMARY

Now: Mirafra Software Technologies, Hyderabad, Software Engineer I, 19th June 2025-Present.

Past: Completed Advanced Embedded Systems Course at Vector India Pvt Ltd. (0.7 Years)

SKILLS

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

Good Understanding in Linux Device Drivers

- **Linux Kernel and Driver Development:**Character device drivers, (Registering the device,Data Transfer through IOCTL,File Operations), Platform drivers (UART, GPIO,I2C).
- **Memory Management**: Kernel memory allocation like kmalloc and vmalloc.
- **Interrupt Handling**: Writing and managing interrupt handler using Bottom Half mechanisms such as workqueue, tasklets,and kthreads.
- **Device Tree:**Configuration and integration for device driver.
- Memory Leaks in kernel and Crash Dump Analysis (kernel panics and kernel oops).

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 I²C 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), I²C, ALSA Audio, Networking (TCP Sockets)
- Hardware: Raspberry Pi, I²C 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 .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)

ACHIEVEMENTS & ACTIVITIES

- Elite Certificate in Digital Circuits course from NPTEL.
- Participated in “Design and Implementation of Low-Cost & Highly Reliable Embedded Systems” workshop (ECE Dept., 2021).

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