

# ADARSH KATIYAR

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## SUMMARY

Proficient in firmware engineering with 2 years of experience in developing Linux-based streaming applications and system-level software. Strong expertise in C programming and Shell scripting for embedded systems development. Skilled in multi-process and multi-threaded programming, with a focus on synchronization mechanisms, Inter-Process Communication (IPC), and socket programming. Experienced in debugging complex systems using advanced tools like GDB and Valgrind for performance optimization and issue resolution.

Familiar with networking protocols and embedded communication, and experienced in hardware integration with various sensors, including ultrasonic, flame, and temperature sensors, interfacing with ESP32 boards. Knowledgeable in utilizing IoT frameworks such as ThinkSpeak for data collection and visualization. Dedicated to continuous learning and improvement, with a collaborative approach to cross-functional teamwork and project execution.

## TECHNICAL SKILLS

- 🔗 **Hardware Platforms:** ESP32 Development Board, Arduino Board, i.MX8M Plus, STM32H735G-DK Board
- 🔗 **Operating Systems:** Linux
- 🔗 **Communication Protocols:** RTSP, WebRTC, MQTT, CoAP, HTTP, SPI, I2C, UART, SNMP, TCP/IP, UDP, Bluetooth, Wi-Fi
- 🔗 **Development and Debugging Tools:** Vim, Gedit, Wireshark, GDB, Make, GCC, DS View, GStreamer
- 🔗 **Programming Languages:** C
- 🔗 **Scripting Languages:** Shell Scripting
- 🔗 **Embedded Systems Knowledge:** Basic understanding of **Linux BSP (Board Support Package)** development and configuration

## WORK EXPERIENCE

### Associate Engineer, Volansys Technologies      Dec 2022 - Present

Implemented RTSP Server and Client using the GStreamer framework for embedded systems, facilitating video streaming between the embedded board and CMS. Developed GStreamer pipelines to read frames from USB cameras, perform encoding/decoding, create and parse RTP payloads, and display the video stream on the screen.

Created SNMP agent for network management, ensuring efficient monitoring and communication between devices.

Conducted unit testing and automated testing using Shell scripting to enhance the development and validation process.

Added Wi-Fi and Bluetooth support to the STM32H735G-DK board using the IW612 module, expanding wireless connectivity options for IoT applications and improving system interoperability.

## EDUCATION

PG-Diploma In Internet of Things | C-DAC Acts,Pune Mar 2022 - Nov2022 Bachelor of  
Electronics and Communication Engineering | RMLAU Universe Aug 2017 - Nov2021

## PROJECT

### Hospital Monitoring Systems

- This project is designed to monitor the presence and movement of critically ill patients in a hospital setting. It captures audio and video data from a USB camera and processes this media to detect the patient's position and presence. If a patient is detected to be out of bed, an automatic notification is sent to the nursing staff. The captured media is also streamed to the **Central Management System (CMS)**, enabling hospital staff to monitor the situation in real time, ensuring timely intervention when necessary.

### V2X Safety Applications

- The **V2X (Vehicle-to-Everything)** safety applications are developed in accordance with **C-ITS (Cooperative Intelligent Transport Systems)** standards established by **C-Roads** and the **CAR 2 CAR Communication Consortium** group. These applications are designed to address the functionalities outlined for **Day 1** and **Day 1+** C-ITS services.

By leveraging critical vehicle data such as **position**, **speed**, and **driving direction**, the applications enable data exchange among vehicles and road infrastructure through cooperative **V2X short-range ad-hoc networks**.

The V2X safety applications analyze the data received from other vehicles and infrastructure, providing timely warnings to drivers about potential hazards such as accidents ahead, slippery roads, or the end of a traffic jam. This proactive communication enhances **road safety**, optimizes **traffic flow**, and improves **driving comfort** by enabling vehicles to respond to real-time traffic conditions and hazards

### NXP- MM Enablement

- The **NXP - MM Enablement** project focuses on providing support for the **IW612 module** with the **STM32H735G-DK** board, enabling the use of **Bluetooth** and **Wi-Fi** technologies for wireless communication. This project aims to integrate the IW612 module, which supports both Bluetooth and Wi-Fi, with the STM32H7 microcontroller to provide seamless connectivity for embedded systems. The project involves configuring the communication interfaces, and optimizing the system to ensure reliable and efficient wireless communication, supporting a range of applications in IoT and other embedded systems requiring wireless connectivity.