

VENKATESH MUTHYAM

Embedded Developer

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Career Objective:

Passionate Embedded Developer with a strong foundation in firmware development, embedded systems programming. Seeking to leverage my expertise in mid-level programming, communication protocols, and IoT solutions to design and develop innovative, high-performance embedded applications that drive technological advancements and efficiency.

EDUCATION

2016-2020	B.Tech [EEE]
KKR & KSR Institute of Technology & Sciences	
2013-2016	Diploma [EEE]
Sri Mittapalli College of Engineering,Guntur	
2013	High School
Zphs Vejendla,Guntur	

TECHNICAL SKILLS

- Programming Languages: **C,C++,Embedded C**
- Protocols:**UART,SPI,I2C,RS-232,HTTP,TCP**
- Development Tools : **Kiel IDE, Eclipse IDE**

EXPERIENCE

Company: EDEL SMART DEVICES PVT LTD

Role: Embedded Developer

Duration: July 2023-Current date

- Designed and developed embedded software solutions based on hardware specifications and product requirements. Developed, tested, and debugged firmware and device drivers for various embedded platforms.
- Integrated SIMCom, Quectel, and Ublox GPS modules for wireless communication and IoT applications. Optimized software for performance, power efficiency, and reliability in embedded systems.
- Provided customer support and on-site troubleshooting, ensuring smooth deployment and post-production support. Collaborated with cross-functional teams, including hardware engineers, system architects, and manufacturing teams, for seamless product development. Worked on engineering changes and component releases while ensuring compliance with industry standards.

Projects:

Advanced Fleet Tracking & Management System

Overview:

Engineered a real-time vehicle tracking system using GPS and LTE modules for fleet management and security applications.

Key Responsibilities:

- Integrated GPS (Ublox NEO-6M) and LTE (Quectel BG95-M3, QCTEL-LTE4G-7SEM-NON) modules for real-time location tracking. Implemented data communication via HTTP, MQTT, and TCP/IP protocols. Developed firmware to parse and process NMEA GPS data, improving tracking accuracy. Designed OTA (Over-the-Air) update mechanisms for remote firmware updates and bug fixes.
- Developed and deployed a GPS-based tracking device using the SIMCom A7670 LTE module for real-time vehicle tracking and fleet management. Interfaced the LTE module with a microcontroller via UART, utilizing AT commands for network registration, data transmission, and GPS data retrieval. Integrated GPS functionality by parsing NMEA protocol messages (GGA, GLL, GSA, GSV, RMC, and VTG) for accurate latitude, longitude, speed, and time synchronization. Implemented cloud connectivity using MQTT and HTTP(S) protocols, enabling secure data transmission to remote servers for real-time monitoring. Developed firmware to process and filter GPS data based on signal strength, accuracy (HDOP, VDOP), and satellite availability, ensuring reliable location tracking.
- Configured and managed LTE connectivity with AT commands such as AT+COPS (operator selection), AT+CGATT (packet attach), AT+CIPSTART (TCP/UDP connection), and AT+CMQTTTTPUB (MQTT publish). Optimized power consumption for battery-powered tracking devices using AT+CSCLK (sleep mode), AT+CFUN (modem power control), and AT+CPOF (low-power shutdown).Designed a geofencing feature, allowing the device to send alerts when vehicles entered or exited predefined locations using real-time GPS data processing.
- Performed real-world testing and debugging using AT command logging, GPS simulation tools, and network signal strength analysis, enabling remote software upgrades via LTE to enhance tracking capabilities. Collaborated with hardware engineers to integrate external sensors (e.g., accelerometers, temperature sensors) for additional tracking metrics and event-based alerts.

GPS BASED SMART VEHICLE LOCK SYSTEM

Overview:

Designed and developed a Smart Cycle Lock system using the SIMCom A7670C module for remote access, GPS tracking, and security enhancements.

Key Responsibilities:

- Developed firmware for remote locking/unlocking, integrating secure authentication mechanisms.
- Configured and implemented AT commands for LTE communication and data transfer. Conducted hardware testing and debugging to ensure module compatibility and performance.
- Enhanced battery efficiency using low-power modes and optimized wake-up mechanisms.

Intelligent Driver Assistance & Tracking System

Overview:

Developed a Driver Monitoring System utilizing SIMCom and GPS modules to provide live location tracking and real-time traffic updates to enhance road safety and navigation efficiency.

Key Responsibilities:

- Designed and implemented real-time location tracking using GPS and cellular communication modules. Developed firmware for traffic update retrieval and alerts, integrating HTTP and MQTT protocols for data exchange.
- Configured AT commands for SIMCom modules to establish reliable LTE connectivity for continuous data updates. Implemented geofencing features to notify drivers about high-traffic areas, roadblocks, and alternative routes.
- Optimized power consumption to ensure the system remains efficient in battery-powered environments. Conducted extensive field testing to validate the accuracy of location data and traffic updates.

Home Security System

Overview:

Designed and developed a Home Security System integrating W5100S Ethernet Controller and USR-TCP232-T2 Serial-to-Ethernet module to enable real-time security monitoring, remote alerts, and data transmission to a server for enhanced home safety.

Key Responsibilities:

- Implemented W5100S Ethernet Controller to establish a stable wired network connection for secure data transmission.
- Integrated USR-TCP232-T2 module for serial-to-Ethernet communication, allowing real-time data transfer between microcontroller and server. Developed firmware to monitor security sensors (motion, door, and window sensors) and transmit alerts using TCP/IP protocols.
- Configured AT commands for network communication, enabling dynamic IP allocation using DHCP and static IP settings for reliability. Implemented HTTP and MQTT protocols for remote monitoring and cloud-based data storage.
- Optimized real-time alert system to send intrusion notifications to a remote server, ensuring low latency and high reliability. Conducted network stress testing and security validation, ensuring secure data transfer and preventing unauthorized access.

Expertise in Embedded Modules & Hardware

- Cellular Modules: SIMCom A7670C, SIMCom 800C, Quectel BG95-M3, QCTEL-LTE4G-7SEM-NON
- Wi-Fi & Ethernet: Wiznet 360 Wi-Fi, Wiznet 5100L-C Ethernet Module
- GPS Modules: Ublox NEO-6M

Certifications

Completed a Certificate Course in Embedded Systems [ISM Institute of Training}, gaining expertise in firmware development, microcontroller programming, and real-time embedded applications.