

Exploration Project Report

Vehicle Theft Detection

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Introduction

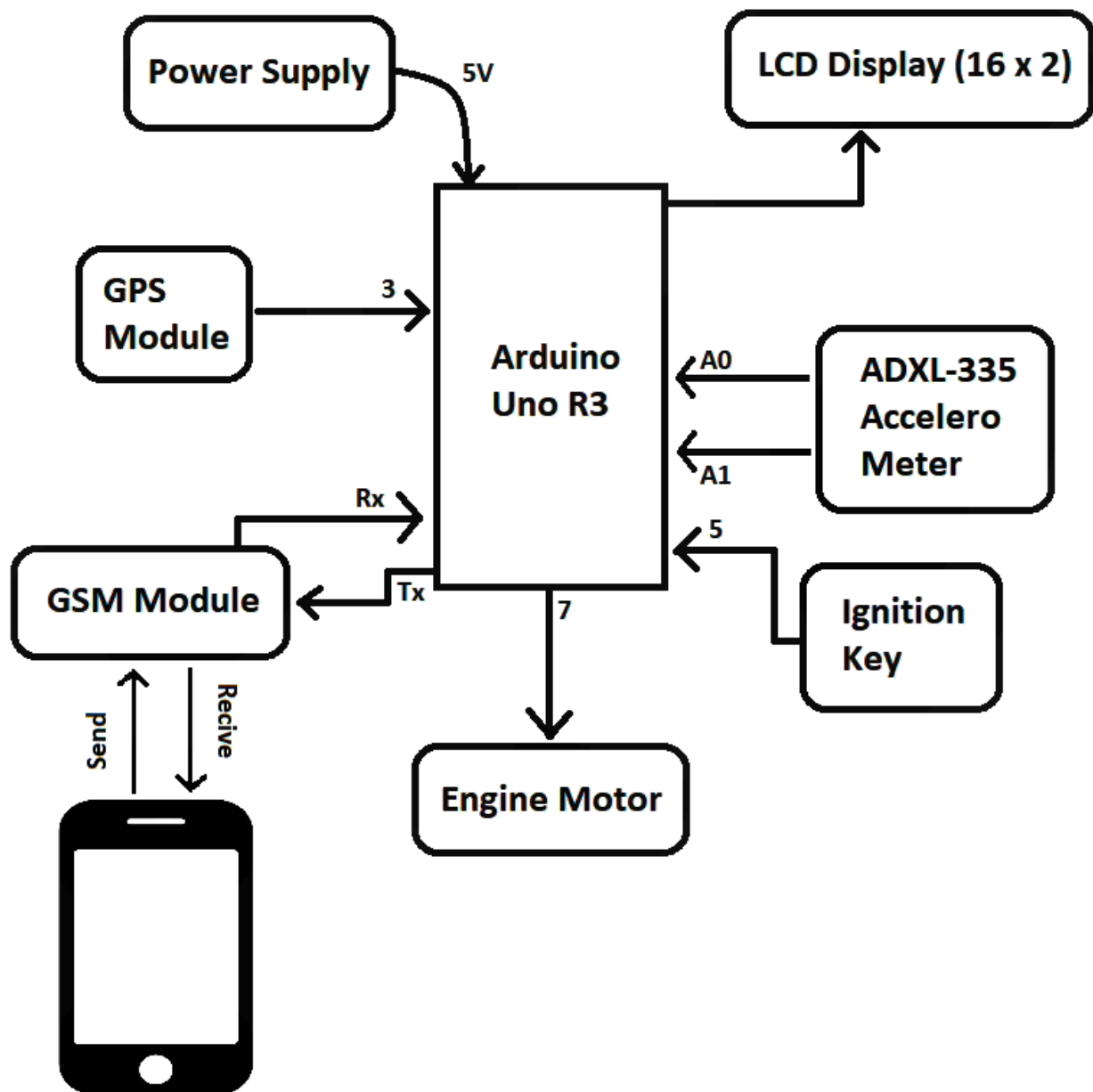
Vehicle tracking systems have become increasingly popular in recent years, as they offer a number of benefits for both individuals and businesses. These benefits include:

- Peace of mind: Knowing the location of your vehicle at all times can give you peace of mind, especially if you are concerned about theft or unauthorized use.
- Fleet management: Vehicle tracking systems can be used to track the movements of a fleet of vehicles, which can be helpful for businesses that need to monitor the location of their assets.
- Security: Vehicle tracking systems can be used to deter theft and vandalism, as well as to track down stolen vehicles. Additionally, these systems offer the capability to remotely control the vehicle's engine using a compatible gadget, providing an added layer of security and control for the owner.

Motivation

We chose to develop a GPS-GSM car tracking and control system because we believe that it has the potential to offer a number of benefits to individuals and businesses. We are motivated by the idea of providing people with a way to keep track of their vehicles and to protect them from theft and unauthorized use. We also believe that our system could be used to improve fleet management and to make roads safer.

Block Diagram

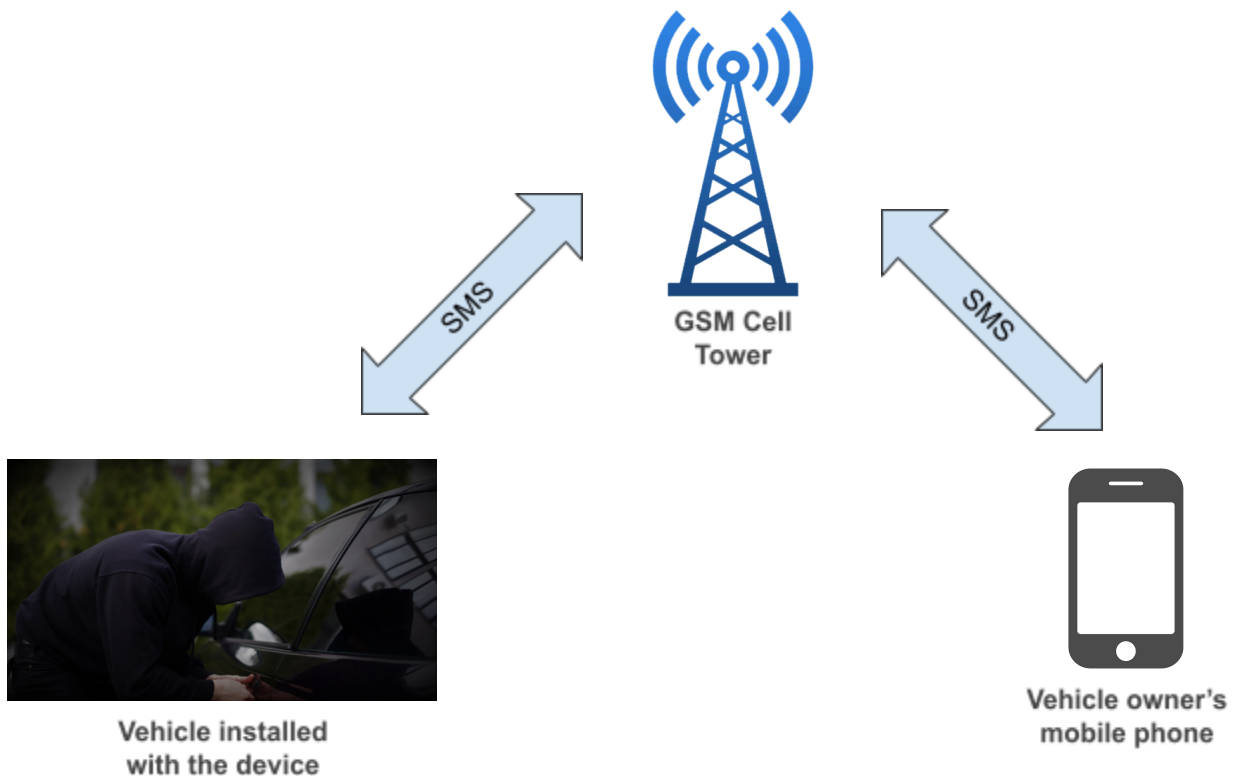


Working of integrated circuit component

The implementation of the GPS-GSM car tracking and control system involves the integration of several key components. The GPS module plays a crucial role by acquiring accurate location data from GPS satellites, enabling real time tracking and monitoring of the vehicle. Through the integrated GSM module, the system can establish remote communication using the GSM network, facilitating the transmission of location updates and control commands.

To provide a user-friendly interface, the system utilizes an LCD module to display vital information such as the vehicle's location. This real time data visualization enables users to track the vehicle's movement and make informed decisions. Additionally, data processing techniques are employed to extract relevant information from the GPS data, ensuring the delivery of accurate and precise location information. The integration of sensors, including the ADXL335 accelerometer, enhances the system's functionality by measuring and detecting the vehicle's acceleration and motion. This additional data contributes to monitoring and control purposes.

At the core of the system is the Arduino Uno R3 microcontroller, serving as the central control unit. Its firmware is developed to handle crucial tasks such as GPS data extraction, GSM communication, and control command processing. This enables the system to receive and execute remote commands, including the ability to immobilize the vehicle or trigger alarms. As part of the security measures, whenever the vehicle starts, a message is sent to the server. If someone other than the owner attempts to start the car, an unauthorized activity is detected, and a message is sent to the owner. The owner can then send a message to permanently stop the car, effectively preventing theft.



By integrating these components and functionalities, the GPS-GSM car tracking and control system offers a comprehensive solution for real time tracking, remote communication, and control capabilities. It ensures accurate location information, provides a user-friendly interface through the LCD module, enhances security measures, and enables effective fleet management. The combined utilization of the GPS module, GSM module, LCD module, accelerometer, Arduino Uno R3 microcontroller, and other components results in a powerful system that facilitates efficient vehicle tracking and control, contributing to improved security and peace of mind for car owners.

Hardware

- **GPS Module:** The GPS module is responsible for acquiring accurate location data of the vehicle by receiving signals from GPS satellites, enabling real time tracking and monitoring.
- **GSM Module:** The GSM module enables remote communication between the tracking system and a remote server or user's mobile phone via the Global System for Mobile Communications (GSM) network, allowing for location updates and control commands.
- **LCD:** The LCD (Liquid Crystal Display) module provides a user-friendly interface by displaying essential information such as the vehicle's location, speed, and other relevant data in real time.
- **ADXL335 Accelerometer:** The ADXL335 accelerometer is utilized to measure and detect the vehicle's acceleration and motion, providing additional data for monitoring and control purposes.
- **Arduino Uno R3:** The Arduino Uno R3 microcontroller board serves as the central control unit, processing data from the GPS and accelerometer modules, facilitating communication with the GSM module, and controlling other system functionalities.
- **Power Supply:** The power supply ensures the reliable and uninterrupted operation of the entire system, providing the necessary electrical power for all components.



Tools that will be used in the project

Hardware

- Arduino Uno R3 (around Rs.2000)
- 16x2 LCD Display (around Rs.200)
- GSM Module SIM900A (around Rs.900)
- GPS Module NEO 6M (around Rs.500)
- ADXL335 Accelerometer Module (around Rs.400)
- Power Supply and Cables (around Rs.1000)

Software

- Arduino Editor

Cost

Based on the tools and components specified, the total estimated cost for the project would be **INR Rs.5000**.



Goals

- Provide users with real time updates on the location of their vehicles.
- Offer a variety of features, such as geofencing and speed alerts.
- Integrate the system with a variety of devices, such as smartphones and computers.
- Enhance fleet management efficiency and improve asset protection for businesses and individuals.

Conclusion

In conclusion, the GPS-GSM car tracking and control system successfully achieves real time vehicle monitoring, remote communication, and control capabilities. It provides accurate GPS data extraction for precise location information, enhances fleet management, and improves asset protection. The system's cost-effectiveness, scalability, and reliability make it a valuable solution for vehicle tracking and control. The project's comprehensive documentation serves as a valuable resource for future research and development. Overall, this project offers significant benefits in terms of improved fleet management, enhanced security, and a cleaner, more efficient tracking system.

