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Car Security System using IOT

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ABSTRACT: Security system is the method which is electronic circuit secured implemented through a system of interworking components and devices. It has become the highest priority in everyone's life. From unlocking the car in the morning to locking the doors and closets before sleeping, one comes across various kinds of locking mechanisms everywhere. The current trend in car security technology involves integrating various biometric features like RFID and fingerprint sensors to mitigate potential security risks. This paper proposes a car security system using IOT integrates RFID technology and fingerprint sensors to ensure maximum protection of the vehicle.

KEYWORDS: Internet of Things, Arduino UNO, Fingerprint,RFID, GSM.

I. INTRODUCTION

In the 21st century with rapid industrialization and modernization at its peak in the technological aspects, car security has been one of the most important of concerns due to the alarming rise in the number of car thefts. Vehicle security is an important aspect of automotive technology that is designed to protect automobiles from theft, damage, and other forms of unauthorized access. The traditional approach to car security has been the use of mechanical locks and keys, but with the advancements in technology, more sophisticated methods of securing vehicles have been developed. One such method is the use of biometric features like RFID and fingerprint sensors. A tag is attached to the vehicle which when present in front of a proper RFID reader, gets activated by the radio waves from the reader and generates a Unique Identification Code (UID) which gets entered into the system in a toll plaza. Now if the code matches with that of the data it triggers an alarm and the burglars will be caught. This paper proposes a car security system using IOT integrates RFID technology and fingerprint sensors to provide maximum security for automobiles. The system aims to authenticate the identity of the user before granting access to the car. This is achieved by integrating both RFID and fingerprint sensors into the system design. The objective of this project is to design an automated digitally secured door-locking system using Fingerprint sensor, RFID (Radio Frequency Identification) and GSM (Global System for Mobile communication) technology that can be deployed in a secured zone, which restricts entry only to authorized individuals. To eradicate the usage of computationally expensive systems, the proposed system uses the native 8051 micro-controllers, which are simpler to deploy, easier to integrate and require minimal time to perform the desired operation.

II. LITERATURE SURVEY

" A Review of Bike Security System Using Fingerprint GSM & GPS" The Fingerprint matching is done by utilizing the minutiae-based Fingerprint recognition scheme. The vehicle is becoming on only with the bike key. If finger matches failed, it will result in vehicle getting immobilized and an alert message is sent to the mobile number of the owner. ➢ " Fingerprint Based Vehicle Security Monitoring and Tracking Using GSM & GPS Technology" The level of supervision and management for cargo transport vehicles, especially trucks carrying coal it is important to develop transport vehicles remote monitoring module. ➢ "GSM based security system" is very stable and then a normal security system. Normal settings Based on the concept of sensors. They sound the alarm in detecting movement. This technical system is now lost its appeal as it has become a common sight in metros these alarms go off unnecessarily. We proposed a system GSM technique and a better decision-making process our vehicle was built to be very safe. It is a unique wireless Home / Car Safety Device that provides your instant alerts Mobile phone at the moment a security breach is detected It Wireless mode is designed to alert you with your quick call the burglar alarm system prevents an intrusion. ➢ Emerging location-aware mobile technologies are used successfully in cultural contexts. Various technologies, such as RFID and Wi-Fi. Used to allow communication with mobile devices Environment. This paper describes a computer-based in both active and passive RFID Automatic positioning of mobile devices in the art Museums. This program is especially useful Provide location aware information when needed Users can manually select the desired information They love to see. This project has been done successfully Proven for the location and position of PDAs.

III. PROPOSED SYSTEM

A. The proposed car security system using IOT is a smart and advanced security system that provides reliable security to car owners. The system is designed to prevent unauthorized access to the car by allowing only authorized personnel to open the car door. The system works through a combination of RFID tags, RFID readers, fingerprint sensors, Arduino. Each authorized person including the car owner is provided with an RFID tag that contains unique identification information. The RFID reader installed near the car door detects the RFID tag when an authorized person approaches the car. After the detection of the RFID tag, the fingerprint sensor integrated into the car door handle captures the fingerprint of the person attempting to access the car. The main control unit processes the information received from the RFID reader and fingerprint sensor, verifying the identity of the person based on the RFID tag and matching the fingerprint with pre-registered finger prints. If the identity verification is successful, the control unit sends a signal to the locking mechanism of the car door, allowing it to be unlocked. The car owner or authorized person can then open the door and gain access to the car. An alarm system also triggers in case of any unauthorized attempt to open the car door or tampering with the system, alerting the car owner and nearby individuals. The proposed system provides enhanced security to car owners, minimizing the risk of car theft, and ensures that only authorized individuals can access the car. Moreover, the system is easy to install, user- friendly and cost-effective, making it a practical solution for car owners concerned about the security of their vehicles. The proposed car door security system ensures that only authorized individuals with both an authorized RFID tag and a matching fingerprint can gain access to the car. This integrated approach provides a high level of security and minimizes the risk of car theft. Moreover, the system is user-friendly, easy to install, and cost- effective, making it a practical solution for car owners concerned about the security of their vehicles.

Arduino Uno:
The Arduino is an open-source hardware and software that can make a user to do effective operation in it. The Arduino is a microcontroller. These microcontroller devices help in sensing and controlling the objects in the real-time   situations and environment. Arduino Uno board consists of an ATmega328P microcontroller chip. It has 14 digital input-output pins, 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, and a reset button.

Fingerprint Module:
The Fingerprint Module is a fingerprint sensor with TTL UART interface for direct connection to the Microcontroller UART or PC through the MAX232/USB-Serial Adapter. The optical biometric fingerprint reader has great features and can be embedded in various end products such as access control, arrival, security deposit box, car door locks.

RFID Reader:

The RFID stands for Radio Frequency Identification. It can be used for monitoring the Sweeper. The Organization wishes to provide the identity tag for the Sweeper. It can read and write data to RFID tags within its range. Readers can be fixed or handheld and come in various forms, including desktop, wall-mounted, or integrated into other systems.

RFID Tag:

RFID tags are a type of tracking system that uses radio frequency to search, identify, track, and communicate with items and people. RFID tags come in various form factors, including labels, cards, keychains, and even embedded in products or animals for tracking and identification purposes

GSM Model:

A GSM module is a device that allow electronic devices to communicate with each other over the GSM network. GSM is a standard for digital cellular communications, which means that it provides a platform between device and mobile.
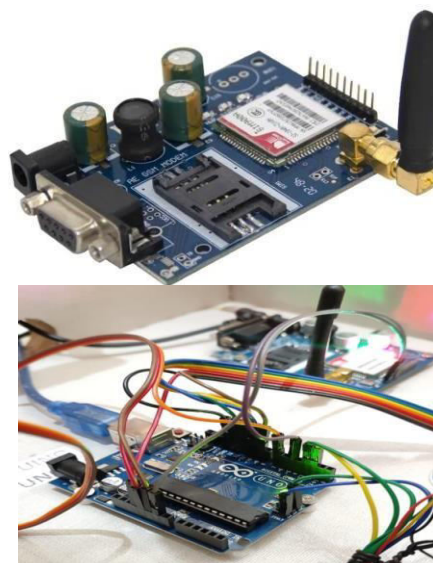

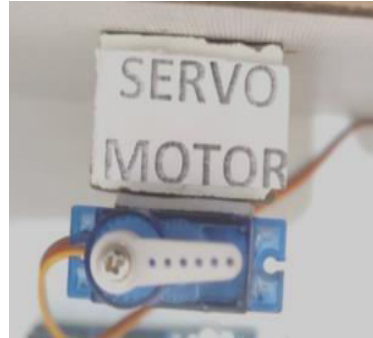Fig. ARDUINO UNO

B. Connections and Working:


Fig. Servo Motor (lock and unlock)

Fig. Fingerprint Sensor

Fig. GSM SIM 900 A

Advantage:

[1] Enhanced Security: IoT-based car security systems provide advanced security measures, such as GPS tracking, motion sensors, and alarms, which help deter theft and unauthorized access. These systems can not only notify the car owner of any suspicious activity but also allow them to take immediate action and track the vehicle in real-time.

[2] Real-Time Monitoring: With IoT, car owners can remotely monitor their vehicles in real-time through their mobile devices. This allows them to keep an eye on their car's status, location, and any potential security breaches. Real-time monitoring helps in quick response and provides peace of mindto the car owner.

[3] Convenience and Remote Control: IoT-based car security systems offer remote control capabilities, allowing car
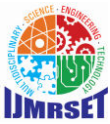
owners to remotely lock/unlock doors, start/stop the engine, and control windows and climate. This adds convenience by enabling users to access their vehicles even from a distance, without the need for physical keys.

[4] Safety Features: Car security systems using IoT often come with various safety features, such as predictive analytics and automated emergency assistance. These features can detect accidents, notify emergency services, and provide immediate assistance, improving the overall safety of drivers and passengers.

[5] Integration with Other IoT Devices: Car security systems using IoT can integrate with other IoT devices, such as home security systems or personal wearable devices. This integration provides a holistic security ecosystem, where actions triggered by one device can affect others, adding an extra layer of security.

Disadvantage:

1. This system is not applicable for poor network connection places.
2. IoT-based car security systems are reliant on technology to work correctly. In certain situations, such as poor network connections or power outages, systems may not function as expected, leaving car owners in potentially vulnerable situations.

IV. FUTURE SCOPE

1. IoT-based car security with AI for predictive analytics and threat detection.
2. Integration of biometric identification (facial/fingerprint recognition) for enhanced security
3. IoT security systems for autonomous vehicles to prevent unauthorized access.
4. Data analytics and machine learning for intelligent and proactive security.
5. Integration with smart cities, including IoT sensors for real-time Car security information.
6. Potential to transform the automotive industry with more efficient, Intelligent, and proactive security solutions.

ACKNOWLEDGEMENT

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