

**A SMART WIRELESS CAR IGNITION SYSTEM FOR VEHICLE SECURITY****Abdul Khayoom Fawas C**Lecturer in Automobile Engineering,  
Seethi Sahib Memorial Polytechnic College, Tirur, Kerala.**Bipin C N**Lecturer in Automobile Engineering,  
Seethi Sahib Memorial Polytechnic College, Tirur, Kerala.**Abstract**

Transporting people and goods is becoming increasingly crucial in today's society; urban vehicle populations are increasing at an alarming rate. In addition, vehicle theft has become an issue that affects everyone. In order to start a gasoline-air mixture, an ignition mechanism is needed. Vehicles with internal combustion engines, such as cars, buses, and other public transportation vehicles, use ignition systems to start their engines. These systems have a wide range of applications. GPS and GSM modem regulate the ignition arrangement of an automobile by voice call and may also locate the vehicle in the event that it goes missing. Using GPS, we can locate the vehicle and start or halt the vehicle with a voice call from an enlisted mobile number. As a result of this innovation, users will be able to better control their vehicles, as well as locate their vehicles if they go out of their control. The Arduino, which is linked to the motor, is also connected to a communication device like a smartphone. Controlling the ignition is possible using the portable's signals.

**Keyword:** Ignition system; Password; Security; Wireless; Arduino board; Bluetooth

**Introduction**

Due to a lack of alternate, reasonably priced transportation options in India, two-wheelers are the most common mode of transportation [1]. Cars make up fewer than 13 %, or 70 % of India's total number of vehicles, on the road today. In addition, in fiscal year 2021, India produced over 18 million two-wheeler units [2]. Security and safety are major concerns in the two-wheeler manufacturing industry, as six riders on two-wheelers die in accidents per hour and 37% of deaths are attributable to two-wheeler mishaps [3]. As stated by the World Health Organization (WHO), the most common cause of two-wheeler-related deaths is the failure to wear a helmet [4]. According to the WHO's own studies, wearing a helmet could prevent fatal and serious brain injuries by 20% to 45%.

In this region of the world, the rate of car theft has reached an alarming rate. Engineers in this country have been conducting research to find a long-term solution to this problem. GSM technology and digital control techniques were considered as a viable treatment by this study team in an effort to find a long-term solution. [5]

There are several different types of anti-theft devices on the market today, including GPS tracking and alarms. Immobilizers, alarm systems, GPS, and even basic steering wheel locks are

all common components of these security systems. Theft and robbery of automobiles continue to be problems since current security measures fall short in critical areas. This is largely due to a lack of security system upgrades and adaptability to new technology, which makes it simpler for professional criminals to get about. [6] In addition to stealing the vehicle, these bandits resell the vehicle's parts. Furthermore, the price of these systems, both in terms of initial purchase and ongoing maintenance, is higher. A GPS system, for example, typically includes a yearly monitoring cost. Car theft rates haven't decreased despite enormous investments in these systems. To ensure the safety of the vehicles, a circuit is needed to protect the starting mechanism. [7]

Installing and activating the system in the car is necessary. Any attempt by a stranger to open the car door and start the engine without permission will result in an automatic immobilisation of the ignition system, which means that the vehicle will not be operable unless the owner has an app installed on their smartphone that aids in car starting. The main benefit of this system is that it allows the owner or guardian to avoid the possibility of their vehicle being stolen. [8]

The GSM-based anti-theft system for a remote-controlled vehicle was designed and built in modules, and the subsystems were then integrated. Figure 1 [9] depicts the overall system architecture and hardware architecture of the system.

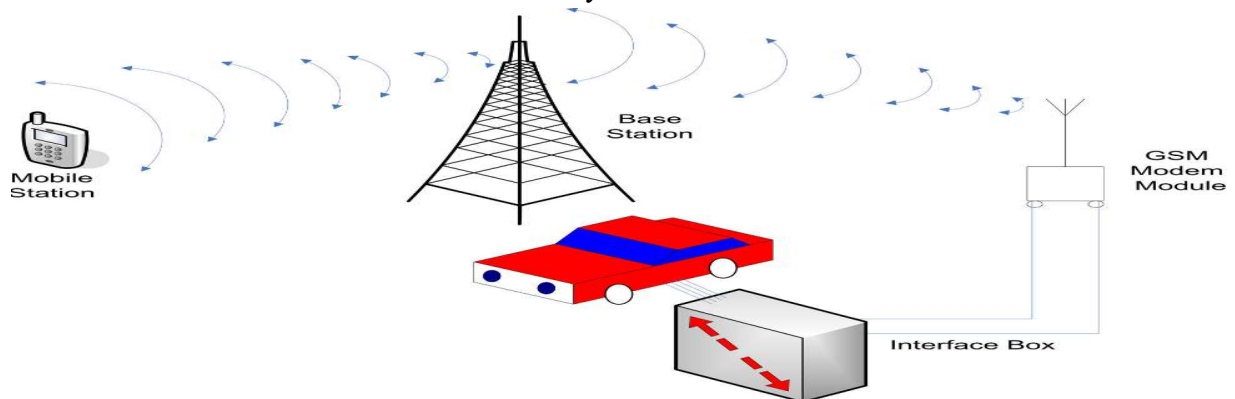


Figure 1 shows a block diagram of a GSM-based remote control car anti-theft system.

### Review of Literature

Automotive ECU-based starting is being developed. Efficient and safe passenger automobile start-and-processing can be achieved using an integrated electronic control unit (ECU), as described by V.M.Murugesan [10] et al. They've measured the peak current and cold cranking ampere (CCA) of lead battery acid or the latest Absorbent Glass Material battery (AGM). Due to the overloading failure of mechanical starter motor components and pitting of electrical contacts of solenoids switch solenoids, an effort has been made to design an electronic-based starting system.

A GPS-based and GSM-based auto theft detection system An anti-theft security system for automobiles was developed by S.Singh [11] et.al. using an embedded system with GPS and GSM integration. Second, the system included two forms of GPS tracking, the first of which can

only get information about a vehicle's whereabouts via satellite data. The second option is offline tracking, where the GSM placed in the vehicle transmits vehicle information to the vehicle's owner. By sending an SMS, a GSM phone owner can take preventative steps such as turning off the engine, locking or unlocking the car, and so on.

IoT-enabled vehicle security frameworks were designed by changing a regular vehicle security framework into an IoT-enabled vehicle security framework, according to B.G.Girish [12] et.al. For this, they've used RFID, GPS, GSM, and cloud-based organisation, as well as a fluffy computation for use in a decision tree. SMS or a mobile application might be used to send vehicle data, such as location, time, and alerts, to the car's owner.

For real-time detection of blunt-force accidents to helmets, a fiber Bragg grating (FBG) sensor was fitted inside a helmet [13]. For residential water quality monitoring through RF modem, systems based on WPAN and LabVIEW have been developed, and the developed system is capable of providing an early warning for contaminated water [14]. Drowsy driver accident avoidance with Raspberry pi [15] is made possible by a smart alert mechanism deployed in an intelligent car. Using IoT-enabled Arduino and Node MCU-based vehicle tracking, the prescribed users who were pre-specified before system installation will be notified of any accidents and their fingerprints will be used to verify their identity [16]. Research shows that a system with numerous characteristics like helmet authorisation and user authentication is severely restricted, according to the findings. In addition, the WPAN helps us design a low-power XBee protocol for short-range data transfer.

### Objectives

- To have a better understanding of the present situation of car theft
- GSM and automotive ignition systems can be used to explore how to prevent car theft.
- To compare the old and new one-car ignition systems in terms of performance.
- To learn about the car's ignition system circuit diagram.

### Research Methodology

This study examines and evaluates a variety of reports on educational and scholarly endeavours in the area under study. A search of web databases yielded a collection of journal articles. Material, the participants, and learning methods were identified as the focus of the study's identification. Papers about scientific study were identified by their subjects, techniques and results as well as the accuracy of their classification methods. The findings of the study were then compiled to serve as the basis for a comprehensive evaluation of the field's teaching and research.

### Result and Discussion

For the most part, this anti-theft technology is concerned with keeping a car's wireless ignition from being used by thieves. Since there is no possibility of interruption between established connections, it is more secure. There is no ignition wire behind the speedometer or

dashboard with this setup, unlike in all other vehicles. This system's design allows for the addition of additional customised features in response to customer requests. [17] These features may include a GPS and GSM system, a camera for facial detection, and the use of Android technology to manage the automobile via a mobile phone. These additional features will, however, add to the overall cost.

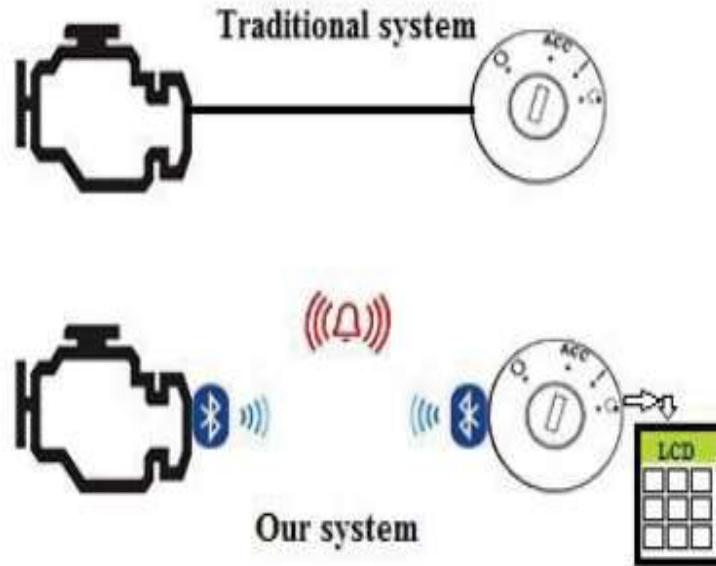


Fig. 2 Comparison of traditional system with our system.

This part includes a device for keeping tabs on the health of the ignition system. An I/O line is used as a modem input in this instance. The modem's sleep mode is woken by the signal received on this I/O line. After then, an emergency alert is sent to the user's mobile phone via auto-dialing. Figure 3 depicts the interface diagram [18].

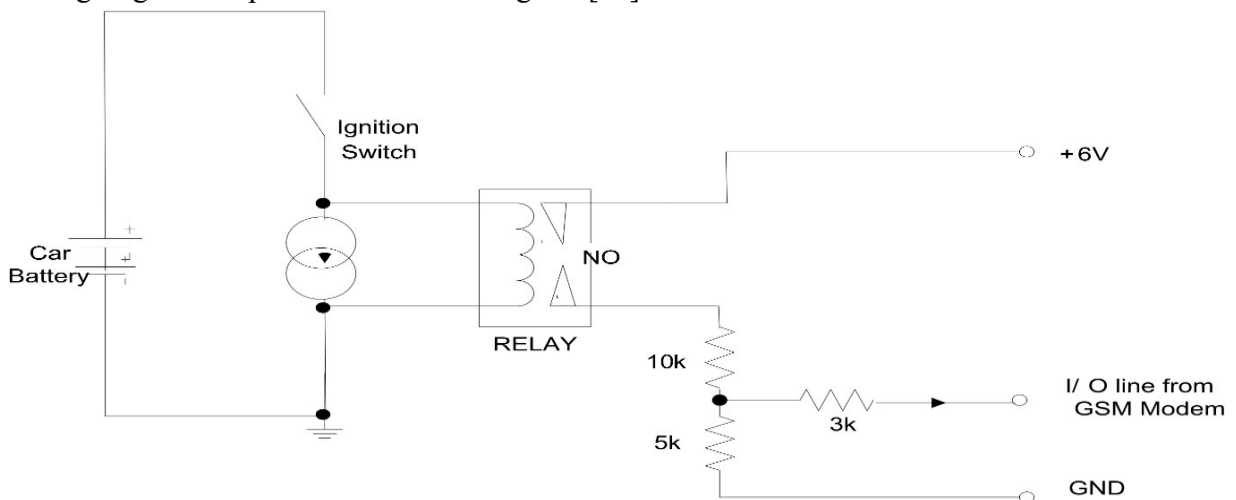


Fig. 3 Ignition monitoring interfacing circuit.

The following flowchart depicts how the various components of the system function together. [19]

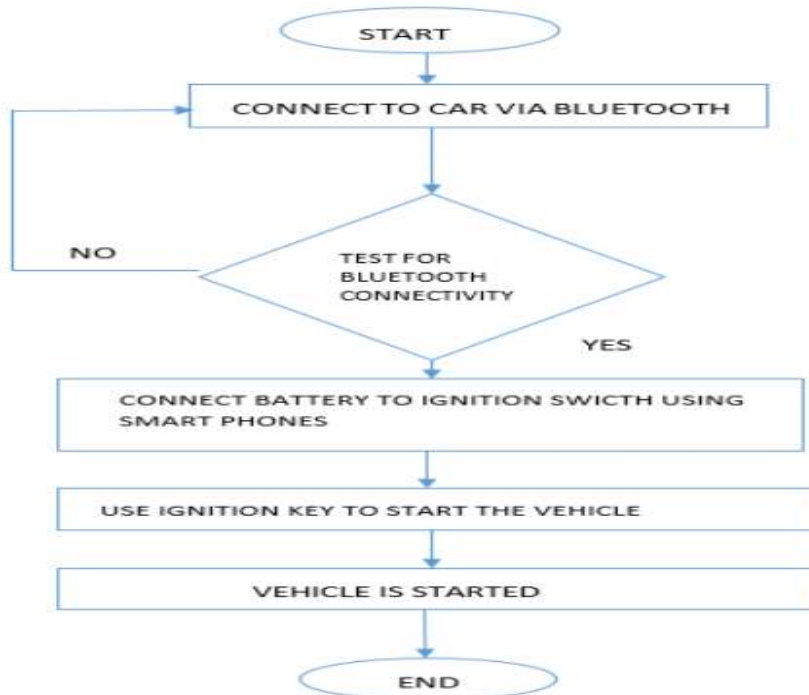


Fig. 4 Working flow diagram

### Conclusion

In order to prevent unwanted access to the vehicle's ignition system, GSM has been used to control the ignition. GSM modules can be easily installed at the user's end thanks to the system architecture that exists nearly everywhere. Wireless systems that are reliable, efficient, and effective are demonstrated in this study. Thus, the GSM network improves the human capacity for comfort. Unauthorized individuals cannot start the vehicle unless they have both the ignition key and the phone app, thanks to the installed ignition system control application. If someone attempts to start a car using only their ignition keys, the system's alarm will sound. Several testing have demonstrated that this system works well, making it difficult for unauthorized people to hack into it.

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## RESEARCH DIRECTIONS

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