

# Engine Locking, GPS Tracking and Accident Detection System of Vehicle

**Vaibhav Gawande<sup>1</sup>, Ishika Kodgule<sup>1</sup>, Yukta Mahure<sup>1</sup>, Shashank Nandanwar<sup>1</sup>, Shivani Pingale<sup>1</sup>, Renuka Daighvane<sup>1</sup>**

<sup>1</sup>Student, Dept. Of Electronic and Telecommunication, Datta Meghe Institute of Engineering, Technology & Research Wardha, Maharashtra, India.

Corresponding Author: [ishikakodgule@gmail.com](mailto:ishikakodgule@gmail.com)

**Abstract:** - The security of the vehicle and the safety of the vehicle owner are the focus of the article on Engine locking, GPS Tracking and accident detection systems of a vehicle. We are going to install three features in this project GPS tracking and engine locking, as well as an accident detection system. With the majority of the population owning a vehicle, theft is common in parking lots and other insecure areas. Vehicle safety is vitally crucial for public transportation, as is user safety. With the inclusion of an accident detection system, one of the most important factors and objectives of this paper is to keep the vehicle secure and safe. This paper will be utilised in the future whenever digital technology is required. This system very efficient and low cost.

**Key Words:** —*Vehicle, GPS Tracking, Accident.*

## I. INTRODUCTION

Vehicle theft is becoming more common by the day thus vehicle security is critical. Because we know that tracking our vehicle's location and stopping it at any moment is impossible, we created a gadget that allows us to track the vehicle's location at any time by sending a message to our smartphone. This system is being developed to increase the safety of our vehicle. We plan to make our Anti-Theft Vehicle Security System for two-wheelers in this manner [1]. This method is extremely beneficial to vehicle security. As a theft prevention and rescue equipment, this vehicle tracking system was found in user vehicles. If the user detects a theft, the user must send a "STOP" message to the microcontroller, which will cause the microcontroller to transmit the required signals to shut down the engine. Without the password, the engine cannot be restarted once it has been turned off [3]. When a user sends the system a "FIND" message, the system sends a return message to that user's registered mobile phone, indicating the vehicle's position in terms of latitude and longitude.

A programme was created to locate the exact location of the vehicle and to navigate the track of the moving vehicle on Google Maps.

According to a Government of India report, the majority of individuals die in road accidents, with 8% of lives that may have been saved if they had received medical attention before to the event [2]. This can be accomplished by determining the cause of the mishap. It has become increasingly difficult to determine whether or not an accident has occurred, as well as to find the location where it occurred [4]. There is no procedure in place for identifying and locating an accident. When an accident occurs, information is only relayed over GSM, and there is no way to pinpoint the location. This project is about the localisation of automobiles. It is simpler to connect. Relays serve as indicators, indicating whether or not the modules powered and whether or not the relay is operational. GPS and GSM- SMS services are used to offer the exact location. We can also determine whether or not the vehicle is involved in an accident using the accident detection system.

## II. METHODOLOGY

### 2.1 Block Diagram & Description:

The Arduino Nano, GSM, GPS, Tilt Sensor, and Relay are shown in this block diagram. The Arduino is the central component that connects the GSM, GPS, tilt sensor, and relay. When the vehicle is started, the vehicle supplies power to the system. After powering up the Arduino Nano, the GSM, GPS,

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and Tilt Sensor are activated. If the user notices the theft, he or she must send a "STOP" message to the GSM. As soon as the microcontroller receives the GSM message, it sends a control signal to the relay circuit, which causes the vehicle to stop running. To locate a vehicle, the user must send the message "FIND" to the GSM. The microcontroller sends a control signal to the relay circuit, which causes the vehicle to cease running. To locate a vehicle, the user must send the message "FIND" to the GSM. When the microcontroller receives a GSM message, Arduino uses GPS to determine the location of the vehicle and sends it to the GSM in the form of latitude and longitude.

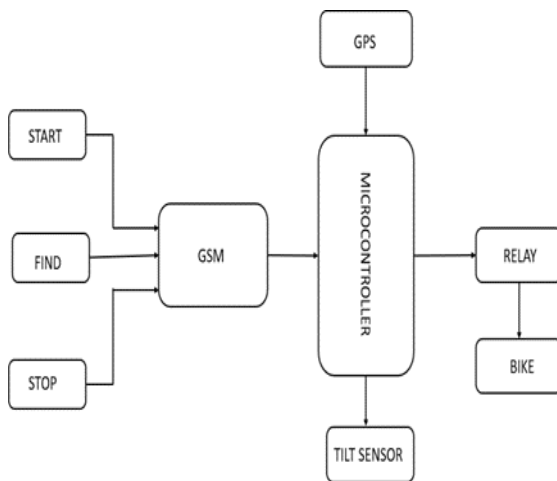


Fig.1. Block Diagram

When the GSM receives a message from the microcontroller, it resends the message to the registered mobile number, along with the vehicle's location. If an accident occurs, the tilt sensor will detect the incident.

The Arduino receives a signal from the tilt sensor. Also, retrieve the vehicle's location from GPS and transmit it to GSM stands for Global System for Mobile Communications. The GSM then sends a text message to the registered mobile phone with the message "Your vehicle has been involved in an accident" and the location of the vehicle. This allows us to follow the whereabouts of our vehicle, protect it from theft, and determine whether or not it has been involved in an accident.

### III. HARDWARE MODULE

#### 3.1 Arduino Nano:

The Arduino Nano is a miniature Arduino board that uses the ATmega328P or ATmega628 microcontroller. The Arduino UNO board's connectivity is the same. The Nano board is a

microcontroller board that is designed to be long-lasting, tiny, consistent, and versatile. In comparison to the UNO board, it is quite little. The Arduino Nano is managed by the Arduino (IDE), which runs on a variety of platforms. IDE stands for Integrated Development Environment in this case. The Arduino IDE and a small USB cable are necessary to get started with our projects utilising the Arduino Nano board. On our respected laptop or desktop, the Arduino IDE programme must be installed. The code is transferred from the computer to the Arduino Nano board through a tiny USB cable.

#### 3.2 GPS Module:

Users can get real-time position and time data from GPS chips and modules everywhere on the planet. The Global Positioning System (GPS) is a navigation system that gives any GPS receiver precise location and time information. Anyone with a GPS receiver and an unobstructed line of sight to at least four GPS satellites can use the system for free. The position of a GPS receiver is calculated by accurately timing the signals sent by GPS satellites. In today's world, GPS is widely employed.

#### 3.3 GSM module:

The acronym GSM refers to the Global System for Mobile Communication. The SIM800L is a GSM module from Simcom that allows any microcontroller to connect to the mobile network and send and receive text messages, as well as connect to the internet through GPRS, TCP, or IP. Another benefit is that the board operates on existing mobile frequencies, allowing it to be utilised anywhere on the planet.

#### 3.4 Tilt Sensor:

The tilt sensor module is a gadget that detects planar movement. They come in a variety of shapes and sizes, but their function is the same. The tilt sensor's job is to detect plane shifts from horizontal to vertical. If the plane position changes, the tilt sensor will give out a signal.

#### 3.5 Relay:

Relay is an electrical device that uses an electromechanical mechanism to operate. The switch is operated (opened and closed) by an electric current. A single-channel relay module is significantly more efficient than a standard relay. It is made up of components that allow for switching and communication. It is simpler to connect. Relays serve as indicators, indicating whether or not the module is powered and whether or not the relay is operational.

#### IV. SOFTWARE MODULES

##### 4.1 Arduino IDE:

Arduino IDE is an open-source software programme developed by Arduino.cc for writing, compiling, and uploading code to Arduino modules. It is open-source software that makes code compilation so simple that even a layperson with no technical background can understand it. It connects to the Arduino hardware in order to upload and transmit programmes. It's compatible with MAC, Windows, and Linux.

##### 4.2 Google maps:

Google Maps is a digital mapping service application for desktop and mobile devices that delivers precise information about geographical regions and sites all around the world. Aerial and satellite views of numerous locations are available on Google Maps in addition to traditional road maps. Google Maps provides street views based on images obtained from vehicles in several cities. According to Google Earth support, the majority of the photographs are less than ten years old.

#### V. RESULT AND DISCUSSION

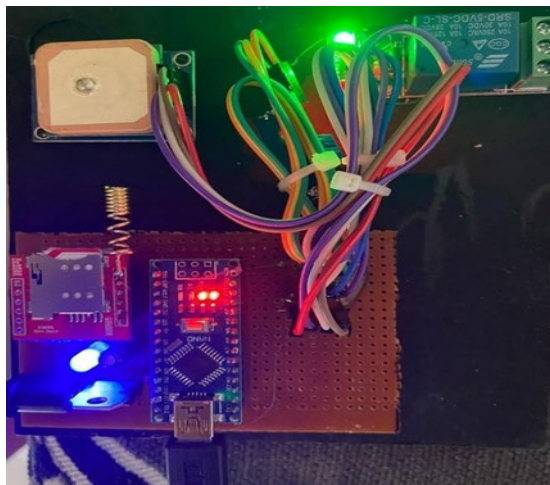


Fig.2. Overall Connection of a GPS Tracking, Engine Locking & Accident Detection System

When a vehicle is stolen, the owner must transmit a "STOP" message to the moving vehicle, which causes the vehicle to come to a complete stop. It cannot be started without the authorization of the owner. If the owner wants to locate the vehicle, he must send the message "FIND" to the gadget. The microcontroller then sends the vehicle's location as latitude and longitude. If a vehicle involved in an accident, the microcontroller sends a message that says "Your vehicle is

involved in an accident." With regard to the registered mobile number's location.

#### VI. CONCLUSION

Our system is cost-effective, energy-efficient, and has a basic architecture. We created an adjustable, customizable vehicle tracking and accident detection system, as well as precise. We tested and configured the GSM modem. The vehicle tracking system was put in place. This enables us to track their whereabouts using SMS and Google Maps. To display the position on the map, we used the Google Map provided by Google. The Arduino serves as the brain and sends out commands. The GSM modem is under your control. Which makes data transmission possible? while the GPS delivers location over the GSM network. Low power usage, a straightforward architecture, and Our system's design includes aspects such as cost-effectiveness. We designed a vehicle tracking system that is adaptable, accurate, and versatile for our proposed work, as well as an accident detection system.

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