

# IoT Based Vehicle Tracking and Monitoring System

**Mouli M, Lal Richard ES, Nithish V**

Students, Department of Electronics and Communication Engineering  
Dhanalakshmi College of Engineering, Chennai

**Abstract:** On reviewing the past work of college vehicle tracking, monitoring and alerting system, there is a possibility to categorize various methodologies and identify new trends. One among them is a challenge for vehicle tracking, monitoring and alerting system. Now- a-days with the increase in the crime rate and accidents, parents worry about their wards when they are going to colleges. And many Students find themselves locked in a college vehicle in the vehicle parking lot after falling asleep on their way to college, miss the vehicle, or leave at the wrong station. This project makes use of the applicability of IOT technology for tracking and monitoring Student during their trip to and from college-on-college vehicles. And it has the advantage of efficient tracking capabilities, low cost and easy maintenance. Location of the vehicle also can be calculated and send a message to the students through GSM. The system consists of three main units, vehicle unit, student unit and college unit. The vehicle unit is used to detect when a student's enters/exits from the vehicle using IOT. The system tracks the college vehicle by the IOT.

**Keywords:** Global Position System, Global System for Mobile Communication, Vehicle tracking

## I. INTRODUCTION

In generally Now- a-days with the increase in the crime rate and accidents, parents worry about their wards when they are going to colleges. And many Students find themselves locked in a college vehicle in the vehicle parking lot after falling asleep on their way to college, miss the vehicle, or leave at the wrong station. The emergence of the Internet of Things (IoT) has revolutionized various industries, including transportation and logistics. In this context, the development of IoT-based vehicle tracking and monitoring systems has gained significant attention due to their potential to enhance operational efficiency, safety, and security. This paper presents a comprehensive review of the existing literature on IoT-based vehicle tracking and monitoring systems, covering various aspects such as architecture, communication protocols, sensor technologies, data analytics, and applications. The goal is to provide researchers, practitioners, and decision-makers with a deep understanding of the state-of-the-art in this field, enabling them to make informed decisions and identify avenues for future research. The objective of the objective is to design and implementation of a system which can be used for tracking and monitoring vehicle.

## II. EXISTING METHOD

In Existing method, the Vehicle monitoring is done by only manually. There is no authentication for vehicle. GPS or Location Tracking: IoT devices equipped with GPS technology are installed in vehicles to continuously track their location. These devices gather location data and transmit it to a central server or cloud platform. Telematics and Vehicle Data: In addition to location, IoT devices can collect various data points from vehicles, such as speed, fuel consumption, engine performance, and diagnostic information. This data can be used to monitor vehicle health, analyze driver behavior, and optimize fleet management. Connectivity: IoT devices rely on wireless connectivity, such as cellular networks or satellite communication, to transmit data to the central server or cloud platform. This allows real-time monitoring and tracking of vehicles from anywhere.

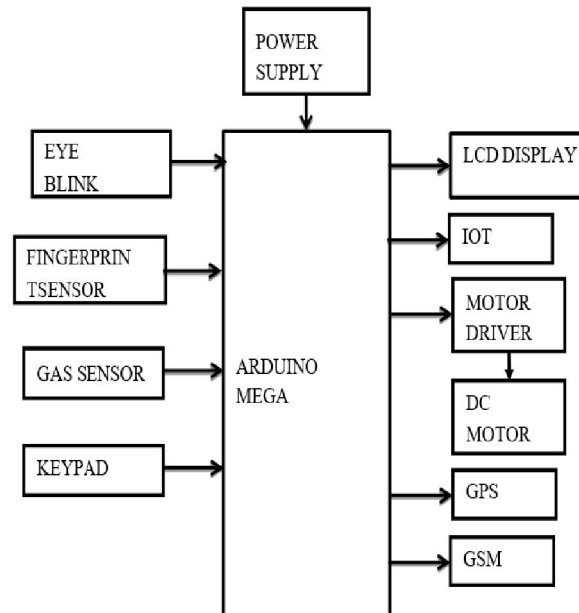
## III. PROPOSED SYSTEM

In proposed method, the monitoring is done automatically through IOT. Here we provide fingerprint authentication for authorized person to access the vehicle. Vehicle Tracking Devices: Each vehicle would be equipped with a tracking

device that collects and transmits real-time location data. These devices can use technologies like GPS, GSM, or a combination of both to accurately determine the vehicle's position. Communication Network: A reliable communication network, such as cellular or satellite communication, would be used to transmit the vehicle's location data from the tracking devices to a central server. This network ensures seamless connectivity and enables data transfer over long distances. Central Server: A centralized server would receive and process the incoming location data from multiple vehicles. It would store the data and provide a platform for further analysis and monitoring. The server could be hosted on the cloud for scalability and accessibility.

#### IV. CONCEPT AND TECHNOLOGIES

In this proposed method, ARDUINO MEGA microcontroller is used to interface with the sensors and to the communication devices. The objective of this proposed system is to develop an project which will help to provide information to college going students. The LCD will show two routes to the college and the driver will choose any one of them. After choosing route system will ask authentication for bus that authentication process done by fingerprint sensor. Fingerprint Sensors.



Fingerprint Scanners are used for recognizing and authenticating the fingerprint of an individual. Eye blink Sensor is a relatively effective sensor used to detect eye blinks. It uses a simple infrared sensor to detect if the person's eye is closed and the corresponding data received can further be processed by the driver drowsiness or not. MQ Gas sensor is a Metal Oxide Semiconductor (MOS) type Gas Sensor mainly used to detect gases like Methane, Butane, LPG, Smoke, etc. The global positioning system (GPS) is a network of satellites and receiving devices used to determine the location of something on Earth. GSM stands for Global System for Mobile Communication. GSM is an open and digital cellular technology used for mobile communication. When student requesting the bus location through sending short messages that time GPS get the current location of the bus and send through GSM. We use motor drivers to give high power to the motor by using a small voltage signal from a microcontroller or a control system. Here DC motor act as a vehicle for this proposed system. The keypad is used to select the routes of college. All the current information are stored in cloud And also displayed in Liquid crystal Display.

#### V. WORKING

In this proposed method, ARDUINO MEGA microcontroller is used to interface with the sensors and to the communication devices. The objective of this proposed system is to develop an project which will help to provide information to college going students. The LCD will show two routes to the college and the driver will choose any one of them. After choosing route system will ask authentication for vehicle that authentication process done by fingerprint

sensor. Fingerprint Sensors. Fingerprint Scanners are used for recognizing and authenticating the fingerprint of an individual. Eye blink Sensor is a relatively effective sensor used to detect eye blinks. GSM stands for Global System for Mobile Communication. GSM is an open and digital cellular technology used for mobile communication. When student requesting the vehicle location through sending short messages that time GPS get the current location of the vehicle and send through GSM. We use motor drivers to give high power to the motor by using a small voltage signal from a microcontroller or a control system. Here, DC motor act as a vehicle for this proposed system. The keypad is used to select the routes of college. All the current information is stored in cloud And also displayed in Liquid crystal Display.

### EYE BINK SENSOR



The ever-increasing numbers of traffic accidents all over the world are due to diminished driver's vigilance level. Drivers with a diminished vigilance level suffer from a marked decline in their perception; recognition and vehicle control abilities & therefore pose a serious danger to their own lives and the lives of the other people. For this reason, developing systems that actively monitors the driver's level of vigilance and alerting the driver of any insecure driving condition is essential for accident prevention. Many efforts have been reported in the literature for developing an active safety system for reducing the number of automobiles accidents due to reduced vigilance.

### GAS SENSOR (MQ-2)

Sensitive material of MQ-2 gas sensor is SnO<sub>2</sub>, which with lower conductivity in clean air. When the target combustible gas existance, The sensor's conductivity is more higher along with the gas concentration rising Sensor is sensitive to flammable gas and smoke. The circuit has a variable resistor. The resistance across the pin depends on the smoke in air in the sensor. The resistance will be lowered if the content is more. And voltage is increased between the sensor and load resistor.

### NODE MCU

The ESP8266 is the name of a micro controller designed by Espressif Systems. The ESP8266 itself is a self-contained Wi-Fi networking solution offering as a bridge from existing micro controller to Wi-Fi and is also capable of running self- contained applications. This module comes with a built in USB connector and a rich assortment of pin-outs. With a micro USB cable, you can connect NodeMCU devkit to your laptop and flash it without any trouble, just like Arduino. It is also immediately breadboard friendly.



### GSM

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves. The working of GSM modem is based on commands, the commands always start with AT (which means ATtention) and finish with a <CR> character.

For example, the dialing command is ATD<number>; ATD3314629080; here the dialing command ends with semicolon.



### GLOBAL POSITIONING SYSTEM

GPS or Global Positioning System is a satellite navigation system that furnishes location and time information in all climate conditions to the user. GPS is used for navigation in planes, ships, cars and trucks also. The system gives critical abilities to military and civilian users around the globe. GPS provides continuous real time, 3-dimensional positioning, navigation and timing worldwide.



### VI. CONCLUSION

The scope of the project represent the prototype that focus on vehicle tracking and monitoring system. In general, our project makes use of the applicability of IoT technology for the process of tracking and monitoring by the student and the management during the trip to and from college on college vehicles. And it has the advantages of efficient tracking capability. And it also easy for maintenance in low cost

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#### **BIOGRAPHIES**

- **Mouli M** is currently pursuing a Bachelor of Engineering in Electronics and Communication from Dhanalakshmi College of Engineering, Chennai affiliated with Anna University.
- **Lal Richard E S** is currently pursuing a Bachelor of Engineering in Electronics and Communication from Dhanalakshmi College of Engineering, Chennai affiliated with Anna University.
- **Nithish V** is currently pursuing a Bachelor of Engineering in Electronics and Communication from Dhanalakshmi College of Engineering, Chennai affiliated with Anna University.