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OVER SPEED INDICATION THROUGH GSM

C. Sridhar Babu[1], Divya Vanam[2], Saka Supriya[3], Bettela Sruthi[4]

[1]Assistant Professor, Dept. of Electronics and Communications Engineering, G. Narayanamma Institute of Technology and Science, Telangana, India
[2,3,4]U. G Student, Dept. of Electronics and Communications Engineering, G. Narayanamma Institute of Technology and Science, Telangana, India

***Abstract*- Rash driving is a major cause of traffic accidents all around the world. Traffic congestion is getting worse as the rate of vehicle increase accelerates. Most Indian cities experience a variety of traffic-related problems during peak hours, including congestion, accidents, pollution, and other problems. Young adults are most at risk for deadly accidents, and one of the main causes of the rise in accident frequency nowadays is over speeding. The methods used for over-speed monitoring are numerous. However, a lot of labor is needed to use these techniques. This project focuses on the design and execution of a system that enables parents or the vehicle owner to easily keep an eye on their cars from their homes. An IR sensor is used by this system to continuously determine the vehicle's speed. Any vehicle's speed is informed to the driver with a buzzer and is shown on an LCD screen when it exceeds the speed limit. Until the driver resumes driving at a normal speed, the buzzer will not stop.**

Additionally, the system has a GSM and GPS module. When a vehicle exceeds the posted speed limit, the GSM module notifies the owner of the car, and the GPS module provides location data for the vehicle. On the phone, an app is installed that enables car tracking whenever the owner desires. The gives out the live location of the vehicle. This system not only aims at the over speeding of the vehicle but also protect private vehicles from theft.

***Keywords* –IR Sensor, Over speed, GPS, GSM, LCD.**

1.INTRODUCTION

Among different modes of transportation, road transport is most widely used around the world. Public transit is more commonly used in India. As the years went by people began to enjoy the comfort of owing their own vehicle. There are atleast two vehicles in almost every Indian household. By the end of 2035, predictions indicate that there will be almost 2 billion cars on the road worldwide. Road accidents are on the rise in tandem with the percentage of vehicles on the road, and overspeeding is one of the major contributing factors. Young individuals are most at danger because they often feel the urge to drive faster than the posted limit. This poses a threat to everyone nearby in addition to them.

Speed control measures like speed breakers are kept but only in highly populated areas. Monitoring of speeding vehicles manually is difficult mainly in highways or cities, because a lot of vehicles keep passing by for every minute. Another way is radar guns, they are typically used by traffic enforcement to measure vehicle speed. They would have to ask the driver to stop and issue a speeding ticket if the vehicle's speed was beyond the specified limit. However, the driver frequently chooses to disregard the police and continue driving, which prompts the traffic police to pursue and stop the driver. The whole process is very tedious to the officers incharge.

The issue that we are attempting to solve here is that there is no method to keep track of this excessive speeding, and as a result, no means to keep track of this high speeding. Here, we want to make sure that overspeeding-related traffic incidents are minimized and closely monitored by the competent authorities. To accomplish our goal, we developed a hardware component that will be installed inside the car and will allow us to track the speed of the car while also securing it.

2.RELATED WORK

1. **Prof. S. B. Deokar et al. [1]** has proposed a system with two modules—one for track monitoring and the other for train tracking. It employs two ultrasonic sensors, one in the IR, to keep an eye on the track. In this scenario, the ultrasonic sensor determines the obstacle's perpendicular distance while the IR sensor identifies the obstacle on the track. The Raspberry Pi receives these sensor readings from the IR and ultrasonic devices.
Using Raspberry Pi increases the cost of the model, which is one of its drawbacks. when utilizing a Wi-Fi module is ineffective and may be accomplished with Arduino.

2. **Muhammad Adnan Elahi et al. [2]**, have presented their design for a real-time vehicle tracking system. This layout gives the monitoring tracking server data on the vehicle's precise location as well as its activation. GSM allows for the storage of data on websites. Google Maps can then retrieve the data and show all the information to the user.

3.**According to SeokJu Lee et al. [3]**, a system might be used to track every loaded vehicle live at any given time and place. Live monitoring is possible with the aid of a MAPS app that frequently updates the coordinates. Using the GPS and GSM/GPRS module, the database is updated with the vehicle's location and transmitted. A continual monitoring of the entire operation is possible thanks to the smartphone app.

4.**Wang Hongjian et al. [4]**, have proposed a system where the speed of vehicle is monitored using RFID technology. The RFID transponders are implanted in every car, and the RFID readers are placed along the side of the road. The RFID tags attached to the vehicles provide the owner's information as well as the vehicle's registration number. The vehicle movement is tracked by the RFID readers that were installed on the roads. The speed of the vehicle is calculated using the current caused by the signal from the RFID tag. An appropriate action will be taken on them if the speed is exceeded using the information contained in the RFID tag. The drawback of the system is, it can only cover a limited area when integrated with hardware, making it challenging to continuously monitor the vehicles equipped with them.

5.**Mayuresh Desai et al. [5]**, have developed an Internet of things-based vehicle monitoring system. In this he has created an android-based application that can detect an accident and notify the nearby police station and medical facility through alert message. An external pressure sensor is used in this application to measure the vehicle body's radial force. As a result, this application is crucial for post-accident services and may decrease the effects of an accident.

6.**Manali et al. [6]**, have presented a system that consists of an android smartphone built with GPS and GSM modules and a processor installed in the car. The location of the car is continuously tracked in the web server using GPRS when the vehicle is in motion.

3.PROPOSED MODEL

In the proposed model, a prototype of Over speed indication is designed. The model calculates the speed of the vehicle continuously by using the IR sensor. We have set a threshold for speed, if a vehicle exceeds the given threshold the buzzer starts to buzz and the speed of the vehicle is displayed on the LCD. Simultaneously, the proposed model sends a message to a registered number using the GSM module. The message would consist of a warning says 'over speed alert' and also sends the location of the vehicle with it. We can also track the location of the vehicle using an app which gives us the latitude and longitude of the vehicle. This whole process of alerting the person about vehicle overspeed is done until the individual driving the vehicle reduces the speed. If the threshold is not crossed by a vehicle no alert is sent and just the speed is displayed on the LCD screen.

4.BLOCK DIAGRAM

For developing this Over speed indication prototype, we have used an ESP-32 microcontroller. We have used a DC motor having a rotating shaft which represents the vehicle. The speed of this rotating motor is calculated using an IR sensor, it counts the rotations per minute and calculates the speed accordingly. The calculated speed is displayed on the LCD screen. A switch is used to increase the speed i.e when the switch is used the speed of the motor increases beyond the threshold limit set. The buzzer buzzes as soon as the speed is increased beyond the limit and an alert message is sent to the registered mobile number using GSM module. Simultaneously the location of the vehicle is also sent through GPS module and the vehicle can be tracked with the help of an app.

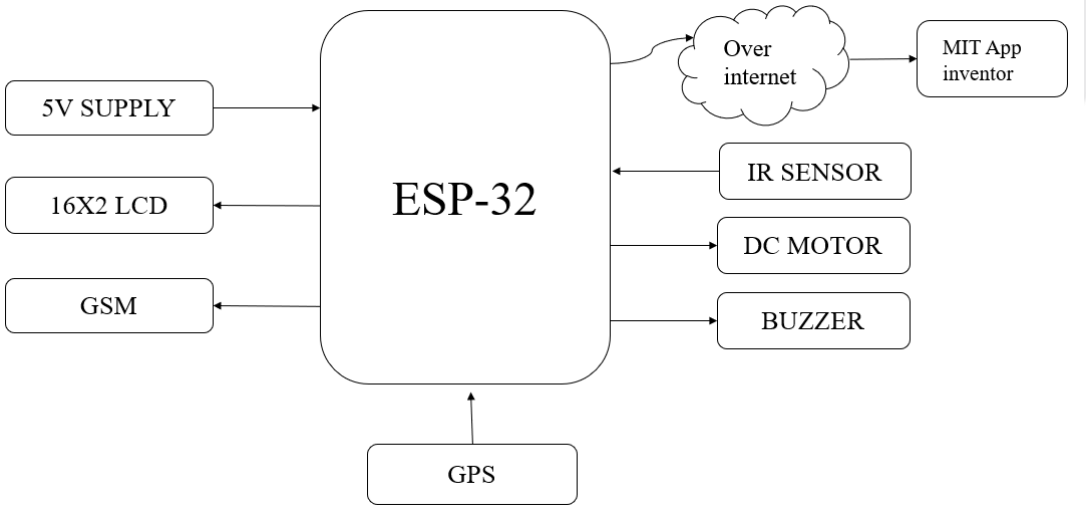
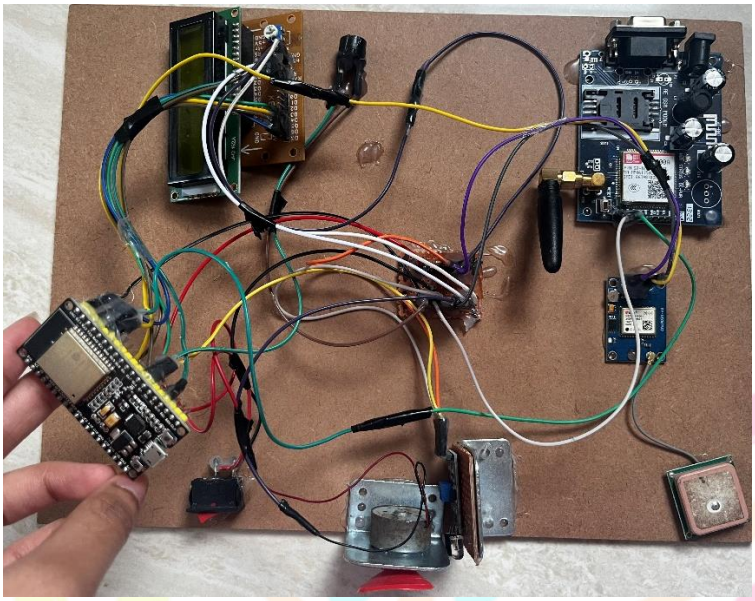


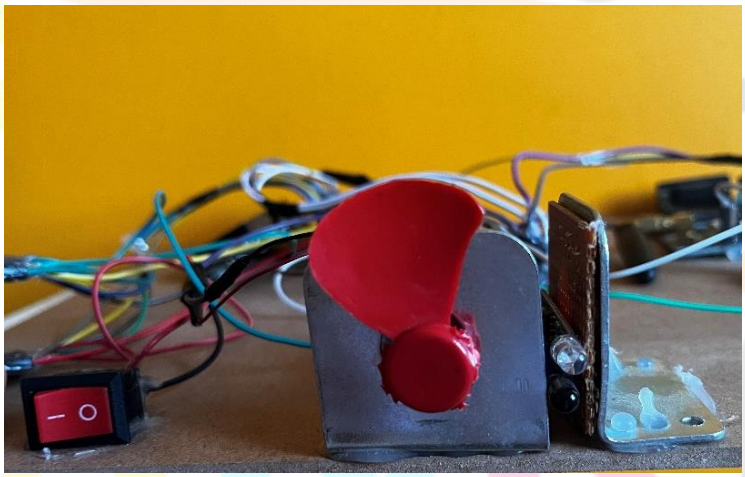
Figure-1 Block diagram of the proposed system

5.METHODOLOGY

The prototype which we made for the project consists of 2 parts. The first part of the project is software and the second part is hardware. For the software part of the project we have used Arduino uno. Code required for the project is dumped in the ESP-32 microcontroller which is main component of the hardware part. The DC motor present in the hardware is connected to the rotating shaft, both of this combined represents the vehicle and an IR sensor is connected to it to calculate the speed of the rotating shaft. If the speed of the shaft is more than the set threshold, the buzzer connected to it starts buzzing and the speed is displayed on LCD screen. It also sends a message saying speed alert with the location of the vehicle to the registered number using GPS and GSM module. This procedure is done continuously till the speed of the vehicle is under the threshold.



(a)



(b)

Figure – 2 (a), (b) Implemented circuit.

6.RESULTS

When the code is dumped into the microcontroller and all the connections are made, we can test it. If the speed of the vehicle is above the given threshold speed, the buzzer starts buzzing and the speed is displayed on the LCD screen. When the speed of the vehicle is not beyond the threshold speed which is set in the code, the buzzer doesn't buzz but the speed is still displayed on the LCD screen, the registered number gets a message with a speed alert indication and also the location of the vehicle.

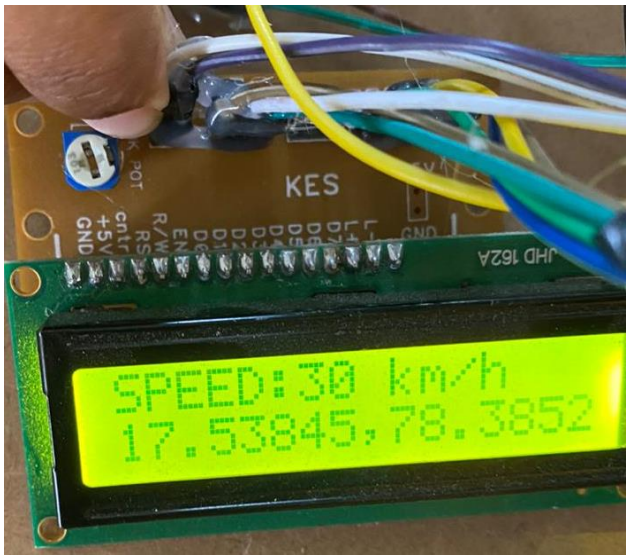


Figure-3 Speed displayed on the LCD screen.

The above figure shows the LCD screen where the speed detected is displayed along with longitude and latitude.

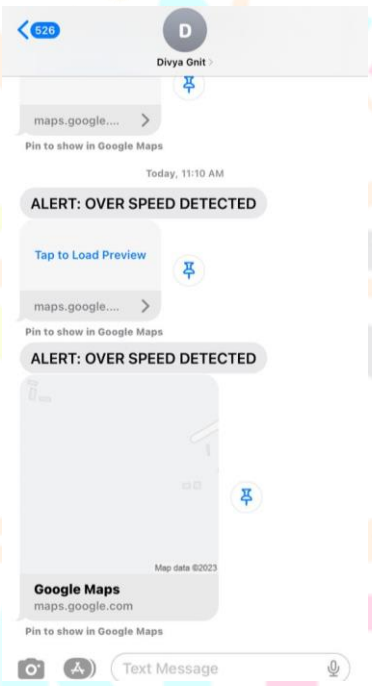


Figure- 4 The alert message sent to the registered number.

The alert message is sent to the registered mobile number as shown in the above figure along with the GPS location.

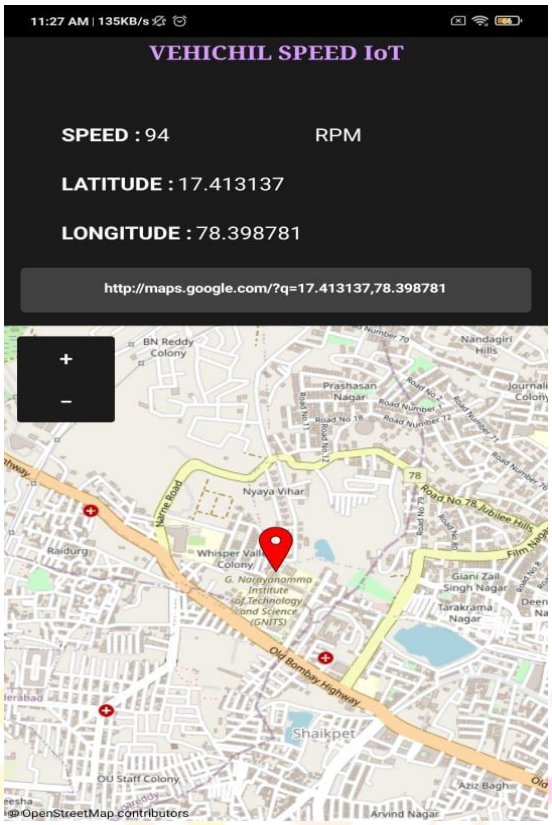


Figure- 5 Vehicle over speed detection app.

The above figure is the view of the vehicle's location in the map, when the GPS location is sent in the message this app opens up when clicked. The vehicle is tracked with the help of this app.

7.CONCLUSION

The vehicle over speed indication system which we have created is a bit different from the traditional system available in the market. This type of system will be used by many businesses, as we can track our vehicle and also be able to detect the speed of the vehicle. Although there are other methods or technology in the market, it's always better to be self-aware of the speed the vehicle is being driven. Especially in the case of teenagers, their parents would get a message and thus the speed can be controlled. The GPS, GSM module and the IR sensor are always updated accordingly the speed of the vehicle and the LCD screen displays the correct speed. We hope that with the making of this system road accidents caused by over speeding is minimized.

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