Real Time Vehicle Tracking and Accident Prevention in School Bus

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Abstract: The proposed project "Real Time Vehicle Tracking & Accident Prevention in School Bus" is a low cost system to track school bus in real time. Now-a-days we are observing a lot of accidents of school buses because of driver's carelessness. This system allows parents to know the exact routing details and the status of driver. Although there are many existing systems for vehicle tracking, drowsiness detection, and alcohol detection etc. separately, this proposed project combines all these features into a single system. Presently, none of the schools assures safety for the kids travelling through the school bus, this system aims at accident prevention providing safety and security to the students. Since the location of the school bus can also be tracked, 'time management' becomes the major advantage of using this system.
Keywords: Real time vehicle tracking, arduino, IR sensors, Eye blink sensor

I.   Introduction

Vehicle tracking system deals with acquiring the exact location. In [2], the system used smart phone application instead of SMS to track and monitor the vehicle location. The vehicle location was automatically placed on google map which made it easier for tracking the vehicle .The proposed system uses GPS for this purpose. Accident rates are increasing day by day mainly due to the carelessness of the driver. This system aims at reducing the accident rates by monitoring the status of the driver- drowsiness and alcohol detection ensuring safety and security to the students travelling via school bus. In addition to this, position of the door (closed or open) is also monitored. In [1], it is mentioned that alcohol sensor can be used to detect alcohol in the breath of the driver and prevent accident due to drunken driving. [6], this system measured and controlled the eye blink using IR sensor. If drowsiness is detected, the output is given to the logic circuit to indicate the alarm.

In the proposed system, information will be conveyed to the parents and school transportation authority via SMS. The routing details will also be updated through SMS and same will also be displayed on a web page which can be accessed using the IP address.

II.   METHODOLOGY

In this project, GPS and Google maps is used for tracking purpose. From security point of view, alcohol sensor, door sensor and eye blink sensor is used. GSM is used for sending SMS. All these components are interfaced to an arduino board. Ethernet shield connects arduino to the internet for accessing the webpage.
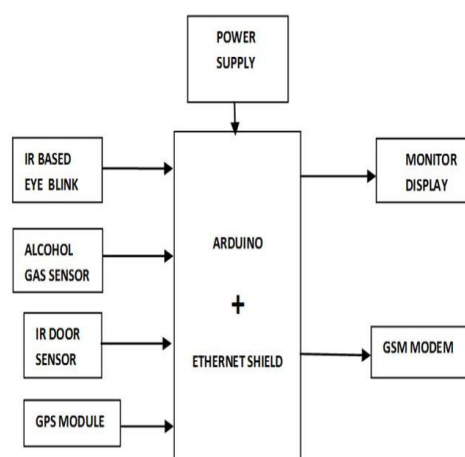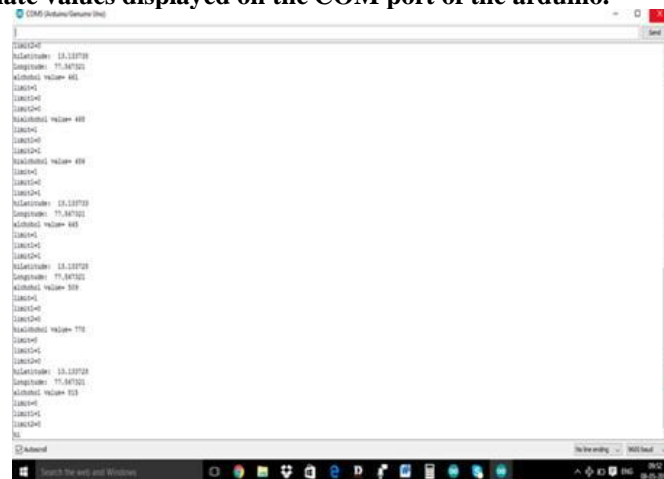
2.1 Block Diagram

Figure.1: Block diagram of proposed system

The sensors, GSM and GPS module are interfaced to the arduino over which the Ethernet shield is mounted.

The sensors are powered up using 5V from the arduino which in turn is powered up using 9V. GPS uses 9V and GSM uses 12V power supply.

Once alcohol is detected by the MQ3 sensor the limit goes low and LED glows. On the other hand if the door is open, the IR receiver does not receive any signal and the limit goes low. Similarly, if the driver is drowsy the IR receiver receives the signal which is reflected by the eyelid and the limit goes high and buzzer beeps. The above conditions will be indicated via SMS.

The coordinates of the location obtained from the GPS will be sent through SMS and displayed on the web page

III. RESULTS

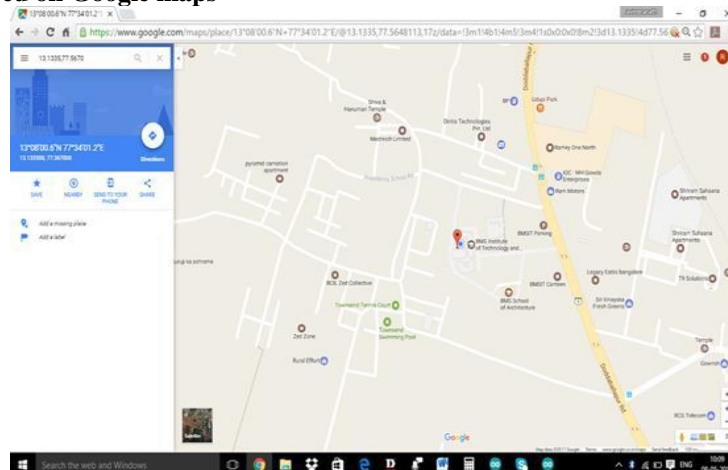**4.1 Limits and coordinate values displayed on the COM port of the arduino.**

4.2 Messages delivered.

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4.3 Outline of the webpage

4.4 Location displayed on Google maps

IV. CONCLUSION

The proposed project "Real time vehicle tracking and accident prevention for school bus" has been implemented successfully. This device can be used on a day-to-day basis as it can be easily implemented in the vehicle. Thus reducing the alcohol and drowsiness related road accidents. It can not only be implemented in school bus but also in ambulances, office cabs etc.

4.1 Advantages
• Cost-effective.
• User friendly.
• Time Management: Students and teachers using the school bus can track the exact location of the vehicle and reach the pick-up point on time without the chances of missing the school bus.
• Provides safety and security to the students.

4.2 Limitations
The webpage is designed for a single user, for multiple users the concept called port forwarding of the router must be incorporated.

4.3 Future scope
The proposed project can be extended by incorporating automatic ignition system where in once the drunken driving or drowsiness of the driver is detected, the ignition system of the vehicle turns off. The next advancement that could be made is the automatic door locking system where in the driver need not manually close the door of the vehicle if its detected to be open.

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