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Project Title: SMART ROAD SAFETY SYSTEM TO MITIGATE THE ACCIDENTS USING IOT

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ABSTRACT

In the developing countries, the vehicle collusion is the main reason for human death. If we observe the top 10 risky roadways in India, we can see that all of them are mountain roads and curved roads. In the hill station the weather condition may get changed during the rainy season and particularly *causes accidents* in *Mist/Fog*. In these kinds of situations the driver of a vehicle cannot able to predict the vehicles coming from opposite side of the curve. Thousands of people lose their lives each year because of these kind of accidents. Since we are talking about mountain roads, here in other side due to the high speed on dangerous roads like accident prone zone such as schools, hospitals many accidents will take place. The solution for this problem is alerting the driver about the vehicle coming from opposite side in the hills station and in the accident zones. This is done by keeping an IoT sensor on the accident zones and keeping a LED light and alarm in the opposite side of the curved road, so that if any vehicle comes from one end of the curve sensor senses and LED light glows at the opposite side. By looking at the LED and the alert buzzer the driver can get alert and also they can slow down the speed of the vehicle. If the vehicle exceeds the speed limit, with an alert notification will be sent to traffic authorities wirelessly about the speed details with vehicle information. This proposed technology can help us to prevent the accidents in the curved roads as well as in the accident prone zones.

LITERATURE SURVEY:

An IoT Architecture for Assessing Road Safety in Smart Cities M. Taha-2018

The Safe System (SS) approach to road safety emphasizes safety-by-design through ensuring safe vehicles, road networks, and road users. If the speed of the vehicle exceeds the speed limit, nearest police station is informed to stop the speeding vehicle. This is an ineffective process as after detecting one has to inform the same and a lot of time is wasted.

Car Over-Speed Detection with Remote Alerting Mrs. Manjiri Pathak -2016

This presents an automated method for detecting the over speed of vehicles and charging them fine at the Toll or by directly call through number plate. If the speed of the vehicle exceeds the speed limit, nearest police station is informed to stop the speeding vehicle. This is an ineffective process as after detecting one has to inform the same and a lot of time is wasted

Road Safety Evaluation System Based on Virtual Simulation J. Lang Wei -2008

The system includes the modeling of virtual road based on Creator, the development of vehicle dynamics model and 3D model, the development of real-time simulation software based on Vega and road safety evaluation model. To be exact, any destruction of any component's normal function of this system may cause a traffic accident.

Smart Highway Systems for Accident Prevention Using IOT Prof. Lakshmipraba Balaji-2017

In this project advanced controller is used that is raspberry pi. It also implements wireless vehicle to vehicle communication. The existing sensor based systems are able to detect only those vehicles that are within the employed sensors measurement ranges when there is bad weather condition, the detection becomes impossible or the accuracy drops significantly Technology Takes Control of Life, Also there is possibility of compatibility and complexity of IoT

An Embedded System in Passenger Car for Road Safety JancyraniMariyal -2016

Automatic collision notification that gives notification to the victim's relative, Red light traffic control makes sure vehicle doesn't break signal, Speed control alters speed in different zones. Simple sensors can be fitted inside vehicles embedded with various features like, automatic collision notification, vehicle security, speed control which can give impetus to an efficient road safety system.

Existing System:

The system can facilitates only the safety-based route planning in smart cities, and or can only detects the interruption on road system.

Proposed System:

The proposed system can controls speed and alert the drivers to avoid accident at accident prone zone. The auto monitoring system can send the notification to the traffic authorities to control traffic and in case of any violation. So that the system can reduce the manpower, by updating each and every vehicle details in cloud to avoid and prevent accidents.

TOOLS REQUIREMENTS

Hardware Requirements:

- Ultrasonic sensor

- Arduino Kit

- LED Diplay Light

- Stepper motor

- Vehicle speed sensor (vss)

- Number Plate Reader IP camera.

- Buzzer

- Gate

- PC with necessary configuration for demonstration.

    Processor: i5

    RAM: 2 GB

    Hard Disk 160GB

Software Requirements:

- Operating system : Windows OS

- Android Application

- Tools:

    o Python

    o Java

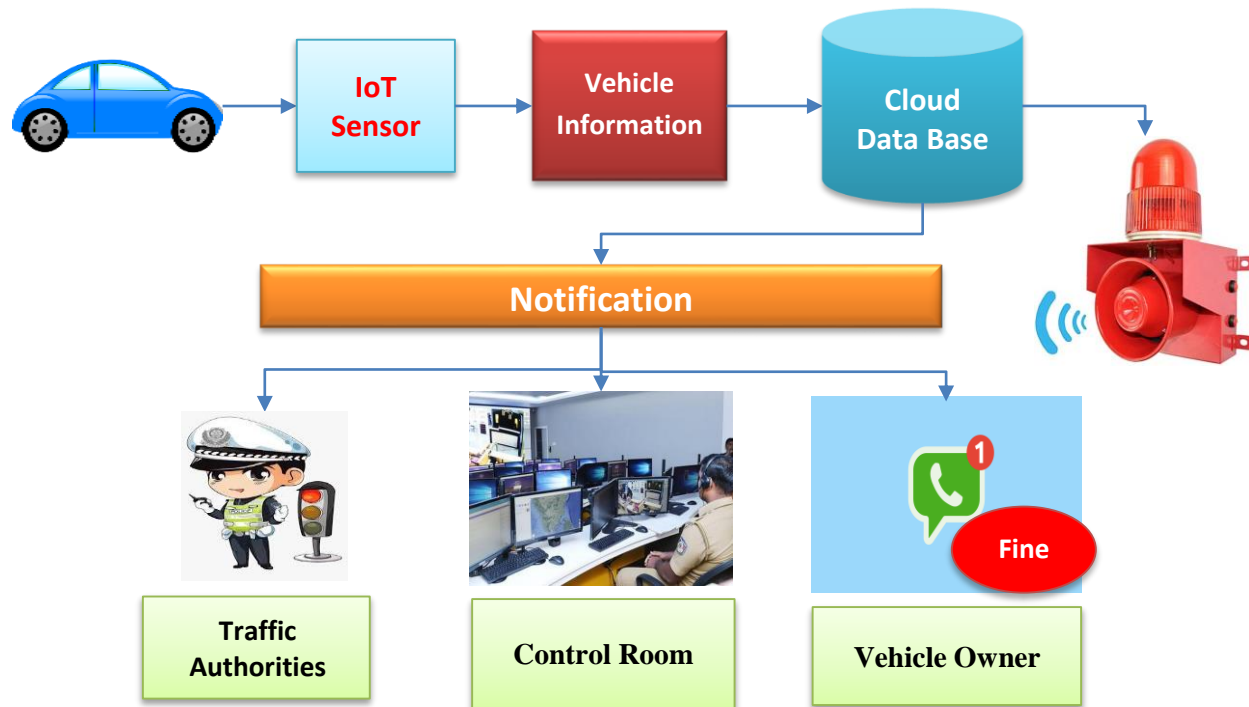   o SQL Server

DESIGN ARCHITECTURE:

**Figure 1: Architecture diagram of the Road Safety System**

METHODOLOGY

1. **Speed Monitoring Method**: Vehicle speed can be monitored through the speed sensor and stored in the cloud database.

2. **Device Initialization Module:** Capture vehicle data such as Number plate and Licences, RC details etc.,

3. **Connecting to Cloud Module:** Collected data will be stored in cloud to match the vehicle status

4. **Security Module:** Provides the alert buzzer and LED display, to avoid accident at critical roads with the help of sensor modules.

5. **Report Generation Module:** This method can generate the vehicle report to control the violation and accident prevention using the smart vehicle monitoring system.

RESULT
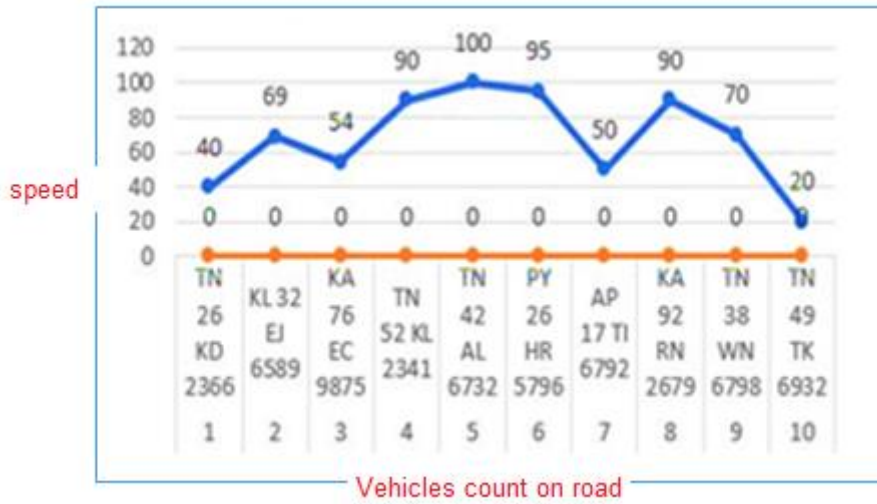
6. Figure 2: Sensed data of vehicle speed on road
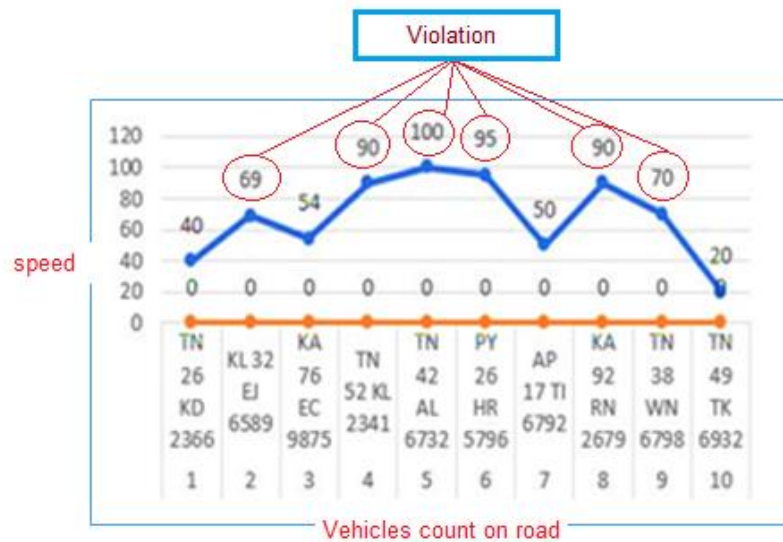
7. Figure 3: Speed Violation report of the vehicle.

Prototype Design:

Figure 4(a): Design module of entire system

Figure 4(b): Design module of the curved road system

Figure 5: Sensor fixed to sense the vehicle and vehicle speed

Figure 6: LED and Buzzer alert to the vehicle on both sides

Figure 7: Gate open/close when vehicle reached at both end point

CONCLUSION

The proposed system will automatically sense the vehicle speed using the sensor and store it in the cloud, the speed alert will be given to the drivers by glowing LED and the buzzer. If the speed of vehicle exceds then the alert information will be given to the traffic controllers by capturing the vehicle number and owner details to detect the exact information about the vehicle. By this way we can prevent and avoid the accidents in tight curved roads and in accident zones. Also the mobile application provides the speed violation information to the vehicle owner about the fine and punishment details. This novel system helps us to avoid the accident as well as the public whose precious time can be saved and it also helps to reduce the manual workloads of the traffic authorities.

REFERENCE PAPER

N. Arbabzadeh and M. Jafari, "A Data-Driven Approach for Driving Safety Risk Prediction Using Driver Behavior and Roadway Information Data," *IEEE Transactions on Intelligent Transportation Systems*, vol. 19, no. 2, pp. 446–460, 2018.