

Vehicle Speed Detection Using IR Sensor

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Abstract— This paper shows the use of IOT based Vehicle Speed Detection. Vehicle Speed Detection is used to detect the speed of the running vehicle with the help of video and image processing techniques. We use camera to capture and analyzed the speed of the vehicle in real time. We detect the vehicle speed with the help of Arduino and IR sensor. Speeding is one of the major factor of all fatal motor vehicle crashes and accident. So, This system is designed to reduce the road accidents in the development of the vehicle speed detector system by using an IR sensor, Camera, 16x2LCD, buzzer, LED and Arduino UNO. In this system we don't need any human work to record the vehicle speed and informs the nearest authorities about the driver and get punished for it. This system aims to record and capture the name plate of the vehicle and send it to the RTO through server, so the person can get punished for over speeding.

Keywords: IR Sensor, IOT, LED and Arduino UNO

I. INTRODUCTION

Vehicle speed detection plays an important role in traffic laws. With the increasing urban life in the cities, the number of people and the number of vehicles are increased drastically. As a result, over speeding became the major reason for accidents. Hence, in traffic management controlling the speed of the vehicle speed has become a important issue in day to day. During last decades, we are using Doppler radar to measure the speed of moving vehicles. It was a hand held device which sent a radio beam to a moving vehicle and then calculated the vehicle speed by measuring the change in reflected wave frequency but it was far more costly. So, instead of using old radar system we are using IR sensor to detect the speed and it was far cheaper than radar system and we can easily afford that. This system focuses on finding speed of vehicles on curved path as well as on linear path and the advantage of using this device is that here the camera detect the speed so the human involvement is less.

II. LITERATURE REVIEW

The paper proposed complete layout of the whole set up will be drawn in form of a block diagram. The IR sensor will detect the speed and give data to the arduino if the driver speed is over fast at first the buzzer beeps then the GSM system will send the vehicle information to the nearest authority and they can track the person with the help of GPS system and at last we use the reset button if our data is full. We can use this device both on highway and the local traffic and the main thing is that this system brings transparency in traffic management system.

III. METHODOLOGY

Working - The Arduino and IR sensor based vehicle speed detector project is very simple. In this project whenever the

vehicle reaches the 1st sensor, Arduino become alert to capture the time and no. of frames of vehicle and it will easily detect the vehicle speed and suppose the speed is high it will send message to the nearest authority with the help of GSM and they can easily trace the vehicle by using GPS.

- 1) The IR sensor is device used as proximity sensor to sense the speed.
- 2) A Buzzer or beeper is an audio signaling device and it beeps when speed is over fast.
- 3) The GPS detect the position of the vehicle.
- 4) The microcontroller is sending the SMS by using GSM MODULE.
- 5) The switch will restart the device (microcontroller) and restart the function begging.
- 6) the Arduino UNO boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards ('shields') or breadboards (for prototyping) and other circuits.
- 7) The LCD Contains GUI interface and display speed unit

IV. GSM – GLOBAL SYSTEM FOR MOBILE COMMUNICATION

GSM (Global System for Mobile Communications, originally Grouped Special Mobile) is an open, it digital technology used for transforming the mobile voice and data. GSM is used to send information and data. Here we have used GSM to send information to the nearest authority whenever the driver brakes the laws.



Fig. 1: GSM module

V. GPS - GLOBAL POSITION SYSTEM

GPS in vehicle is used to track and navigate the vehicle. Here we used GPS system for the help of traffic police to track the driver whenever they brake the speed laws.



Fig. 2: GPS module

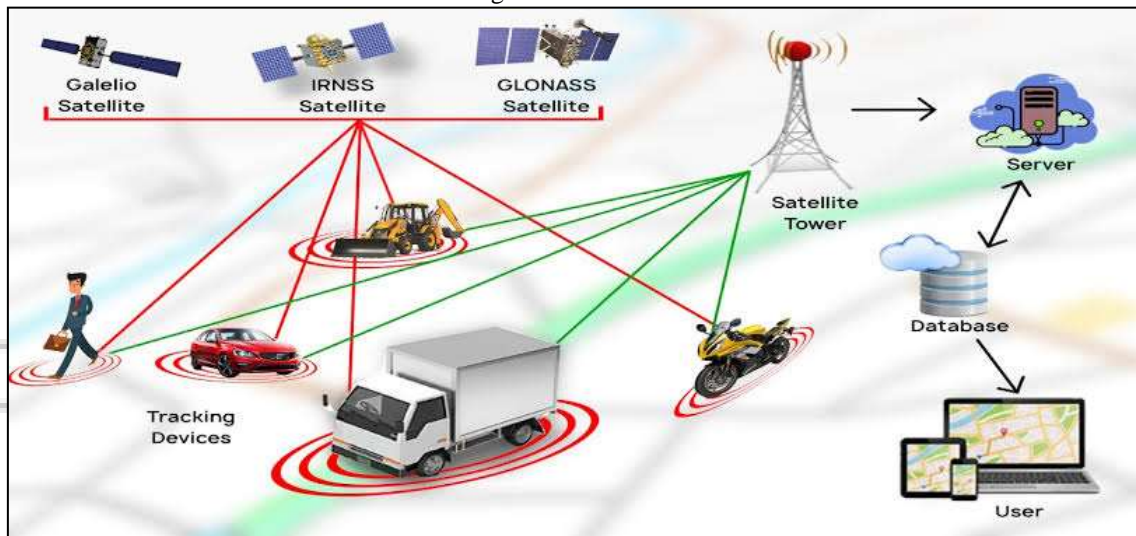


Fig. 3: GPS Tracking System

VI. HARDWARE DESCRIPTION

- 1) Sensor - A sensor is used for speed detection. Whenever speed is over fast the sensors activates and send the message to microcontroller.
- 2) Buzzer - A Buzzer or beeper is an audio signaling device and it beeps when speed is over fast.
- 3) GPS - GPS is use for tracking the longitude and latitude position of the vehicle it is used for both tracking location.

- 4) GSM - It is sending the message with location to pre saved numbers. It is also use to control transformer load anywhere by sending the message.
- 5) LCD - The LCD Contains GUI interface and display speed unit.
- 6) Reset - the reset button is use to resets the data, the reset button use to terminate the sending message, if button is pressed. Then microcontroller is restart and function will restart from beginning.

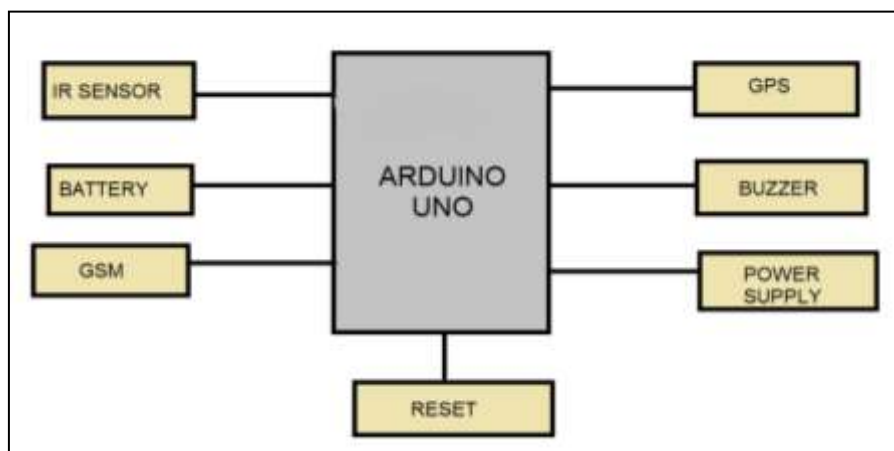


Fig. 4: Block Diagram

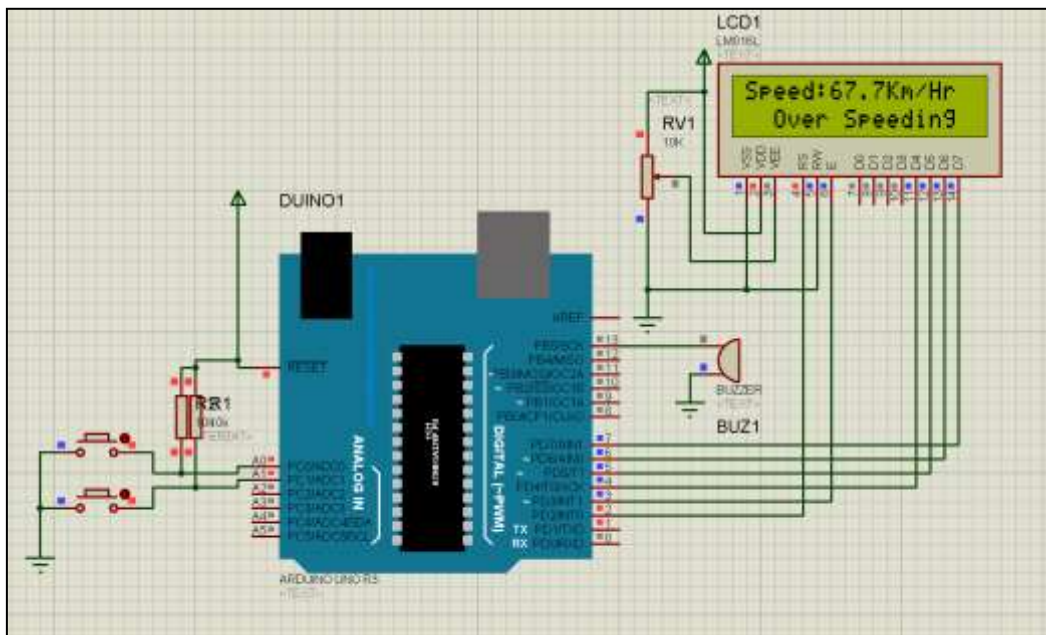


Fig. 5: CIRCUIT DIAGRAM

VII. ADVANTAGE

- 1) Easy to use.
- 2) It has a simple design.
- 3) This system may reduce manpower involvement in traffic management systems.
- 4) System reliable.
- 5) Helps to control accident.

VIII. CONCLUSION

This paper is presented vehicle speed detector system, which is detected using IR sensors in order to detect the speed of the vehicle. So, whenever someone brakes the laws, this device will detect their speed by calculating the time taken to travel between the initial and final point at a fixed distance. The GSM helps the police to perform their duties while sitting in the control room and provide their service with more ease and accuracy. Code had been written in C++ language for controlling the overall system which was uploaded to the microcontroller. Drawback of this system is that we can't use the system without network. So, in area where the network is not proper the system is unable to send the message to the authority.

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