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Vehicle Speed Detection and Over Speed Control System

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ABSTRACT: Vehicle speed control is one of the main concerns for agencies dedicated to road safety. According to the recent surveys, in the past few years, an accident near the school zones, hospital zones and sharp turnings have increased tremendously, because of their hurry to get the targeted place soon. There are several factors that affect the number of accidents and deaths, but over-speed is one of the major factors. So to avoid accidents caused by over-speed, vehicle speed detection and over-speed control system using Arduino and IR sensor is designed. This system detects the speed of the vehicle using a IR sensor and if the limit of the speed is crossed, then the system intimates the person driving the vehicle with a buzzer. The automatic break system is applied whenever there is over speed. This technique helps to reduce the occurrence of the accidents caused due to over-speed.

KEYWORDS*:* Arduino, buzzer, IR sensor, DC motor, Relay

I. INTRODUCTION

Road accidents are the leading cause of death all over the world especially in India. Over-speeding is one of the main reasons for accidents. Approximately, 90% of the accidents can be avoided by controlling the speed limit. To avoid over-speeding here we are designing the speed detection and over-speed control system. Speed detection of the vehicle is done using the IR sensor. IR sensor detects the speed of the vehicle. In this project we place a IR Transmitter and receiver where it sends the distance travelled by the vehicle and the time taken by the vehicle to travel that distance, by using the speed formula the speed of the vehicle is calculated. If the limit of the speed is crossed, then a buzzer is horned. The buzzer is horned to indicate the driver that he/she is crossing the limit of the speed as some people forgot that they are violating the rule of the speed limit, so this sensor helps to remind the over-speeding. Even after the intimation of speed limit, if the person does not reduce the speed of the vehicle then the Over speed controlling technique is implemented. So in order to control the speed, the automatic break system is applied. The automatic break system is applied using relay to control the speed of the vehicle by applying the break automatically, so that the speed of the vehicle is reduced. The IR sensor and over speed control system is developed on the Arduino UNO board. And the IR sensor and over speed control system is connected to the vehicle. This system helps to control the speed of the vehicle and reduce the rate of accidents.

II. LITERATURE SURVEY

[1] Sarmad Majeed Malik, Muhammad Asad Iqbal, Zohaib Hassan, Tauseef Tauqeer, Rehan Hafiz: Here in this project they proposed a system in which the speed of the vehicle is detected on highways using the DIP, Doppler effect and if there is any over-speed is detected then the fine is applied to the specific vehicle and that fine is collected near Toll Plaza.

[2] Mohammed GufranHaseeb, Ankit Kumar, Sujeet Kumar Horo, Ashish Tiwary: In this project the speed of the vehicle is detected using IR sensors and if there is any over speed occurs then the buzzer is horned. The speed limit is controlled by the police and the alert system of buzzer is also limited for police.

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[3] Shubhangi Sanjay Bhargave, Monika Vijay Jadhav, Aditi Sunil Patil: This is all about controlling the speed of the vehicle in restricted areas like school zones, hospital zones and etc. The speed of the vehicle is automatically controlled in restricted areas using AT89S52 microcontroller and IR transmitter and receiver.
[4] S Nagakishore Bhavanam: The project is Automatic Speed Control and Accident Avoidance of vehicle using multi sensors. In this project the sensors detect the obstacle in front of the car and controls the speed of the vehicle and if driver close his/her eyes for certain time then the vehicle speed is controlled.

[5] Lalit Kumar, Mahesh Kamthe, Kunjun Kalbhairav, Rahul More: Vehicle detection system using IR sensors is the project in which the speed of the vehicle is detected and the buzzer is horned to intimate that the person the crossing the speed limit.

[6] Fabian Barreto, Nesline D. Almeida, Premraj Nadar, Ravneet Kaur, Sanjana Khairnar: Here the proposed system is Object Detection and E-challan Generation System for Traffic violation. This system detects the violation of the traffic rules and charges fine using E-Challan.

III. PROPOSED SYSTEM

Here we proposed system where it detects the speed of the vehicle and automatically controls the speed of the vehicles. To detect the speed of the vehicle we are using IR sensors. The system keeps the time taken by the speed of the vehicle in crossing the fixed distance from two sensors. When the vehicle passes through the first IR sensor, this sensor gets activated. From this instant forward, a timer is initiated and will continue to keep time until the vehicle reaches the second IR Sensor. Then the microcontroller starts to count the time and calculate the speed of the vehicle as km/h and this speed is calculated. If the vehicle's speed is greater than the limited speed, the buzzer will be alarmed. It is a warning to Reduced Speed Now. This system is to improve a device that detects over speeding of vehicle, gives warning using alarm. Even though if a person continues over-speeding then an automatic speed control system is implemented. The speed of the vehicle is controlled by using Relay. Relay is the electromechanical device which is used to break the speed.

IV. BLOCK DIAGRAM

The Block Diagram of this System consists of:

- Arduino UNO
- IR Sensor1
- IR Sensor2
- Relay
- Motor

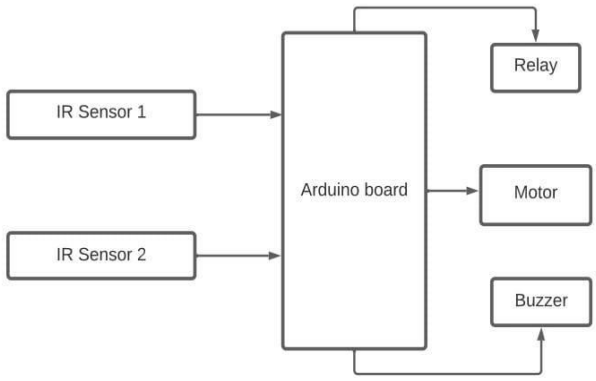

Figure 1: Block diagram of Vehicle Speed Detection and Over Speed Control System

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V. FLOWCHART

This flowchart shows a short idea of how this project works

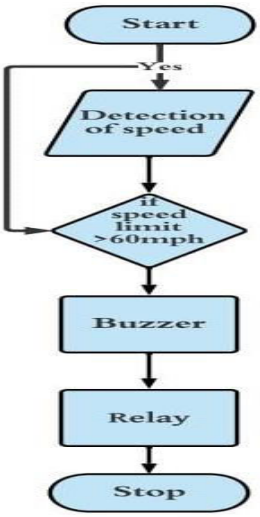

Figure 2: Flowchart of Vehicle Speed Detection and Over Speed Control System

Here the flow chart gives the information how this system work. When a vehicle starts moving the speed of the vehicle is detected using IR sensor. If the speed limit is less than the given speed, then the vehicle moves normally. If the speed of the vehicle is greater than the given speed limit then the buzzer is alarmed. Even though is the speed greater than the given speed limit then the automatic break system is applied to control the speed of the vehicle using Relay.

VI. RESULTS

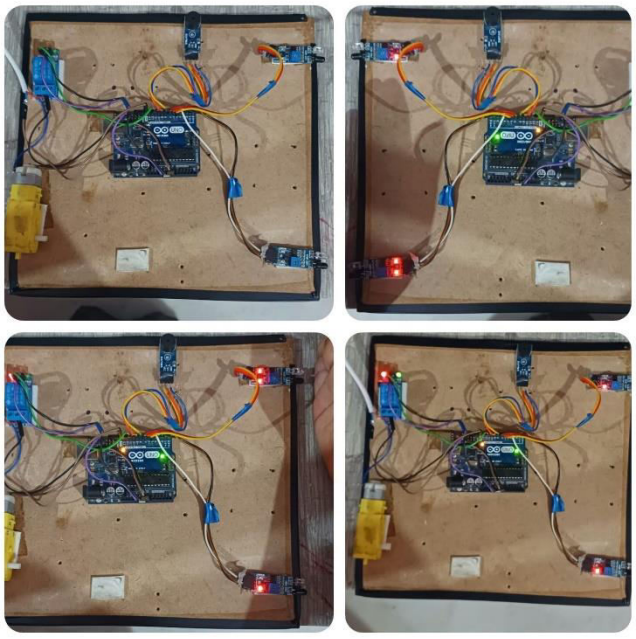

Figure 3: Prototype of the design

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VII. CONCLUSION AND FUTURE SCOPE

Our project is 'Vehicle Speed Detection and Over Speed Control System'. This project helps to reduce the accidents caused due to over speed and protects the life. Our future scope is to include all this Mechanism to cloud and to control of the vehicle automatically. In the further process, the project can be wireless and identify speed according to given speed limit and control the speed automatically. In the upgraded version the modifier can attach camera to the existing system and capture pictures.

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