Wireless Rash Driving Detection System with SMS sending Facility and obstacle detection system

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Abstract: The rate of accidents occurring due to rash driving is increasing abruptly. The present system is able to detect the over speeding but it fails for further execution as it is time-consuming. So, this system will be effective to replace the existing system. As the vehicle, will cross the permitted speed, SMS will be sent to RTO as well as the system will help to avoid the unusual vehicle mishaps.

Keywords: Arduino, Bluetooth Module, GSM, Ultrasonic Sensor, LDR.

I. INTRODUCTION

The most common term for an accident nowadays is over speeding. This project has an aim to avoid or minimize the rash driving. While driving, the driver should not exceed the maximum speed limit permitted for their vehicle. However, accidents keep occurring due to speed violations since the drivers tend to ignore their speedometers. In order to avoid this, a certain threshold will be kept after which a buzzer will start ringing and RTO will be informed about the traffic violation. We are intending to develop a methodology of vehicle speed & direction system for robotics to control and achieve accurate direction speed in the presence of disturbances and parameter variations by using wireless communication technique. This system will help traffic police providing a digital display in accordance with a vehicle's speed but sound an alarm if the vehicle exceeds the permissible speed. The system basically comprises of Hall Effect sensors which are installed on the wheels, with the help of that sensor the speed of the vehicle is monitored. The system will display the speed of the vehicle and with the help of a certain threshold, over speeding of the vehicle is continuously observed. Arduino is the heart of the system, which controls all the function of the circuit. It controls the circuit through a programming flashed inside Arduino ATMEGA328. Hall Effect sensor is used as an eye that keeps watching the speed of the vehicle. As the vehicle exceeds the threshold the GSM module gets activated and sends a message regarding the vehicle and it's over speeding to the RTO.

II. LITERATURE SURVEY

Much of the research and work has been done in the field of over speeding detection system:

Vaibhav Bhoyar, Priyanka Lata, Juilee Katkar, Ankita Patil and Deepali Javale proposed, "Symbian Based Rash Driving Detection System". In this, the entire implementation requires only a mobile phone placed in a vehicle and with the accelerometer. A program installed on a mobile phone computer accelerations based on sensor readings and compares them with typical rash driving patterns extracted from real driving tests. Once any confirmation of rash driving is detected, the mobile phone will automatically alert the driver first and if same driving persists then call 100. They tried to implement the detection system on the Symbian phone and have it tested with different kinds of driving behaviors.

Girish Patwari and Shifali Patel proposed, "Relative Wireless Rash Driving Detection System". In this, the system fulfills that requirement through the wireless mechanism as it consists of two blocks: transmitter and receiver; both use a microcontroller of the 8051 family and a rectified power supply. This project consists of an RF transceiver module operating at 2.4 GHz. Relative Rash driving is detected by the sensor which is interfaced to the microcontroller at the transmitting end and by using the appropriate control signals and equipment's, the traffic authorities are notified.

Amey Sawant, Vinayak Ikke, Jyoti Khandale, Nilam Chavan & Manjiri Pathak proposed, "Car Over-Speed Detection with Remote Alerting". In this, the system will check on rash driving by calculating the speed of a vehicle using the time taken to travel between the two set points at a fixed distance and then transmit the data over 2.4GHz to the central control room. A set point consists of a pair of sensors comprising of an IR transmitter and an IR receiver, each of which is installed on either side of the road. The speed limit set by the device is kept at the very location depending upon the traffic. The time taken by the vehicle to travel from one set point to the other is calculated by a microcontroller program. Based on that time it then calculates the speed and displays that on an LCD and also transmits the same. Moreover, if the vehicle crosses the speed limit, a buzzer sounds alerting the police both at the location and wirelessly at the control room.

III.PROPOSED ARCHITECTURE
The Atmega328 is one of the microcontroller chips that are used with the popular Arduino boards. The Arduino board comes with either 1 of 2 microcontroller chips, the Atmega168 or the Atmega328. Of these 2, the Atmega328 is the upgraded, more advanced chip. Unlike the Atmega168 which has 16K of flash program memory and 512 bytes of internal SRAM, the Atmega328 has 32K of flash program memory and 2K of Internal SRAM.

LCD (Liquid Crystal Display) screen is an electronic display module and finds a wide range of applications. A 16x2 LCD display is a very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi-segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

This fig shows the project block diagram in which all the components are connected to Atmega328. With help of this, we are going to start the Arduino Uno. Before going to start it first find out what we want to connect to Atmega328 and what we need to boot the OS into Atmega328. The components are the power supply, ultrasonic sensor, Bluetooth module, and Hall Effect sensor, GSM, Buzzer, and LCD. LDR and Relay are connected to the LM358 which is a comparator IC, these are not connected to Arduino.

An ultrasonic sensor consists of a transmitter which can send a high-frequency sound wave and reflected signals are received by a receiver. For transmission, long guided waves are used as a transmitting signal. The distance calculating and obstacle detection can be done by using this ultrasonic sensor. The ultrasonic test results are subjective to the inspector's experience and judgment as well as proper handling of device, motor driver which is used to drive the robot. GSM is used to a send a message of over speeding intimation to RTO. The buzzer is on whenever the speed crosses the threshold. Working start from powered up and it is controlled by an android application connected using Bluetooth module. The robot starts running whenever the speed will be exceeded over the threshold it will immediately send the over speeding details to the RTO through GSM. One more facility is added that uses LDR along with relay if it finds higher intensity light it switches from upper to dipper.
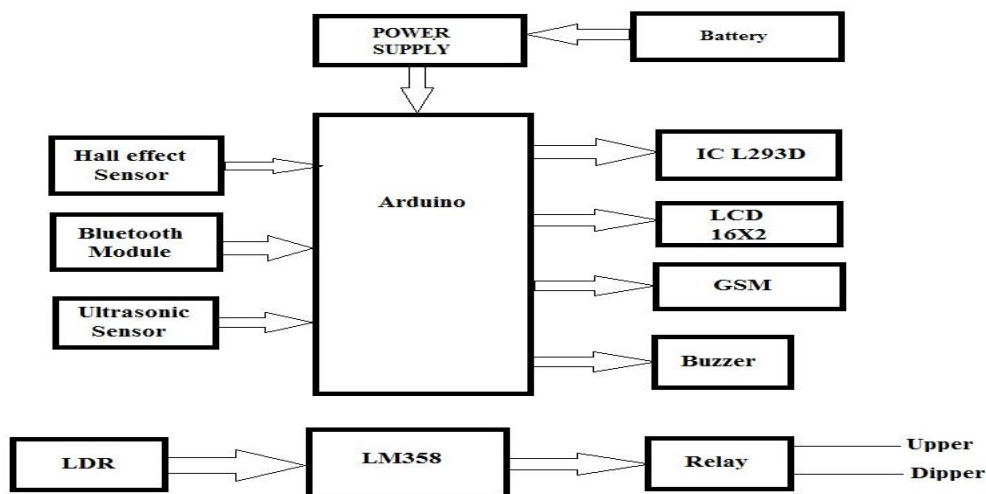

Fig. Proposed Architecture

IV. DESIGN COMPONENTS OF THE SYSTEM

The proposed architecture gives design view of Health Monitoring System which includes the following components:
1) Arduino
2) Hall Effect Sensor
3) GSM Module.
4) Ultrasonic Sensor.
5) LDR.
6) LM358

V. ADVANTAGES OF THE SYSTEM

1. Monitors the over speeding and informs about rash driving.
2. The cost & effort are less in this system.
3. Fast, efficient and user-friendly.
4. They reduce the risk of accidents.
5. It is easy to implement.
6. Improves traffic management system.

CONCLUSIONS

The present wireless rash driving detection system is inefficient and on which we cannot rely. The proposed design would help us to solve the problem faced by the current system. Bringing this application into use would completely transform and improve the current rash driving detection system.

ACKNOWLEDGMENT

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