

Automatic Speed Controlling System Using IoT

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Abstract:- Road accidents are the most common phenomenon that occurs quite often. Most of the lethal accidents that take place are due to over speeding. An increase in speed may multiply the risk of accident and danger of injury during an accident. So, to reduce this hitch our group has come up with a project that aims to control the speed of vehicles automatically in the restricted area. In the recent studies, on the IoT-based topic, it has been observed that accidents near the zones like hospitals and schools have increased enormously, because of their lack of impatience to reach their desired place soon. Therefore controlling the speed of the vehicle has been a key issue to be considered. We through this IoT-based project, we are aiming to provide an uncomplicated design that can control vehicle speed, which can be installed in zones like school/college, hospital, sharp turnings to reduce the number of accidents from happening. This Automatic Speed Controlling System is built using the Microcontroller-based platform of the Arduino Uno R3 board. Here, the microcontroller is programmed in such a way that, the imposed speed limit is integrated with the transmitter unit which transmits the signals using an antenna, and is received by the receiver incorporated inside the vehicle. Alongside the Microcontroller, RF (Radio Frequency) module is also used for sending and receiving the signals. There are two types of RF module, RF transmitter and RF receiver. RF transmitter is placed near the restricted zones and RF receiver is placed inside the vehicle. The speed of the vehicle is then compared and controlled by the Microcontroller.

Keywords: *Arduino Uno R3, RF Transmitter, RF Receiver, Motor.*

I. INTRODUCTION

Research has shown that there are IoT of systems at present that can partially or entirely control the vehicle speed. And there are some that are still in progress as they are not viable to implement. A lot of rules are imposed by the government such as seat belt and helmet compulsion, but there is no efficient speed controlling system that can help prevent road accidents. That's why there is a need for such system that can control the speed of the vehicle. This system will not prevent accidents from occurring but can get reduced to some extent. This project is built using an Arduino Uno R3 microcontroller. Along with microcontroller Radio Frequency (RF) module is used. It is basically a small electronic device that is used to transmit and/or receive radio signals between two devices. In an embedded system, it is often wise to communicate with another device wirelessly. RF (Radio frequency) Module

will be used in our project. So, likewise these two signals are used in our project. The RF transmitter is placed at the restricted zones and on the other hand, the RF receiver is placed inside the vehicle. The signal from the transmitter antenna will be transferred to the controller. It will then compare the vehicle speed with the restricted speed. The current speed is sensed by the proximity sensor using a DC motor that also sends attached information to the controller. The speed of the vehicle can be incremented/decremented manually with the help of push buttons which is embedded in the circuit. If the speed of a vehicle is greater than the speed limit of the area then a message is given to the driver through LCD Display to reduce the speed. In this growing countries, people find difficulty with the accidents occurring on road, rushing of vehicles because of the drivers who dislike obeying the laws at the restricted zone, where the speed has to be finite as authorized in that zone.

II. LITERATURE REVIEW

Recent studies have shown us that the higher rate of major accidents on road is occurred due to high ungovernable speed rather than speed restricted in the zone and also due to ignorant obstacles. The priority for the driver while driving should be conscious of the particular area so they are aware of the obstacle in front of the road. As everyone is aware that road transport is a prime class of transport system used in India. About 1.3 million people die on the world's roads and 20 - 50 million gets wounded every year. A major cause of death is mostly due to road accidents among all age groups and the leading cause of death aged 5 to 29 years. In most instances, the driver is at fault. This becomes more dangerous in densely populated areas like hospitals or schools. In some of the areas, speed bumps are made to create hindrance to the speed of vehicles, but the drivers do not lower their speeds. Several times due to the driver's fault speed is not controlled. The whole system is being controlled by an Arduino Uno R3 as a microcontroller. The main cause for choosing this as a controller is for their benefit of having higher processing speed and their ability to handle multiple I/O at the same time without compromising the fidelity of the outputs.

III. METHODOLOGY

The main objective of the study is to control the vehicle speed automatically at restricted zones such as Hospitals, Schools as well as in accident-prone areas, etc. RF transmitter is attached to the vehicle and the RF receiver will be placed on the particular zones. At every time the vehicle enters into a particular zone, the signal from the transmitter is received by the receiver and the vehicle speed

is controlled with the assist of the microcontroller present inside the vehicle.

3.1. RF MODULE

RF module has a short range antenna attached on the transmitter end. It needs battery or a power source in order to be operated, and for long duration it can be used. It is often desired to communicate with other device wirelessly. The range of the antenna attached on the transmitter is short. It can just release signal from the RF transmitter. Whenever RF receiver come across the transmitter devices, signal is sent to receiver which is placed in the vehicle.

3.1.1. RF TRANSMITTER

It is a small assembly, it can be able to transmit the radio waves with the help of an antenna. This system works along with microcontroller. This is used to give data to the receiver.

3.1.2. RF RECEIVER

It receives the modulated signal and its job is to demodulate it. Two types of RF receiver modules are present: super heterodyne receivers and super-regenerative receivers. Super regenerative modules are usually low cost and low power designs using a series of amplifiers to extract modulated data from a carrier wave. Whereas on the other hand, Super-regenerative modules generally imprecise as their frequency of operation varies considerably with temperature and power supply voltage.

3.2. MICROCONTROLLER

Arduino UNO R3 board is used which is an open-source electronic platform, usually a USB microcontroller and it is a tool for controlling electronic devices by reading inputs and turning into output.

3.3. LCD DISPLAY

(16*2) size LCD display is used, connected with the Microcontroller, for showing the speed of vehicle and if the speed of vehicle is greater, then the LCD will display the message of over-speeding and the speed will get decreased automatically.

IV. WORKING

Initially, the RF Transmitter will be attached to the speed signboard of the Precaution area and the transmitter will continuously emit the signal. Once the vehicle enters an area the RF Receiver will receive the signal from the Transmitter and send it to Arduino Uno (Micro-controller). Thereafter, the vehicle speed is compared by the microcontroller with the specific speed assigned to the transmitter. If the speed is above the limit, then the vehicle is cramped to the particular desired speed limit. This system restricts the vehicle to increase speed beyond the limit. Therefore, using this topology various speed limits for various zones can be set.

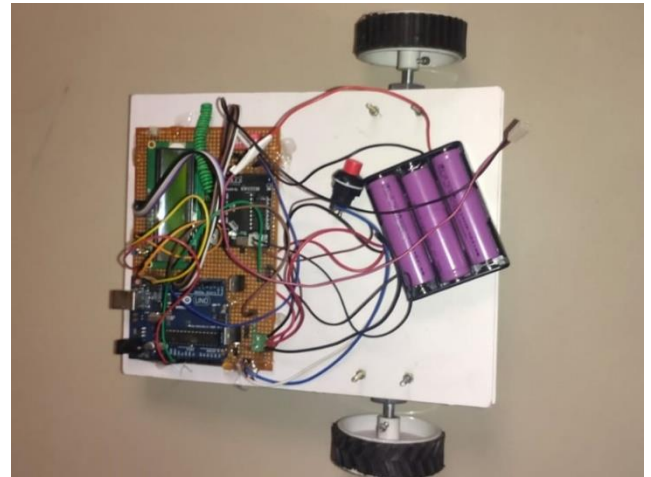


Fig. 1: Hardware of Automatic Speed Controlling System

V. CONCLUSION

This study plays a key role in reducing the speed of the vehicle automatically and it plays major contributions towards the safety of road users. In recent studies, it has been found that the use of the vehicle speed control system can contribute a lot in minimizing the rate of accidents that occurs due to the negligence of the driver to disobeying roadside signboards in restricted zones. India is one of the top countries in terms of road accidents and has also proven that most of the accidents occur because of over speed at particular zones. This paper is proposed an advanced smart zone speed control of vehicles thereby achieving in avoiding accidents. The IoT- based vehicle control system has produced hardware thereby simulating the results on particular days. The hardware is given high performance than existing methods. Hence, this paper is presented a cost-effective and reliable system for avoiding accidents.

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