Automatic Speed Control and Challan System
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Abstract:
Around the world main cause of the motor vehicle accident are over speeding. Despite of many traffic rules like speed zone, stopping at traffic light etc. people simply avoid them. Despite of national road safety strategy and law on speed limit 3 out of 10 accidents cause due to over speeding. Hence we are proposing an Automatic speed control method to reduce the speed of the vehicle in given zone. The speed of the vehicle will not increase above given limit. in this method we are using RF module and IR sensor to detect over speeding and thus it will reduce the speed to a given limit. A led display will be provided to show the speed zone so that driver can control the speed itself. We are also proposing an Automatic challan system with the help of GSM module. If driver will over speed after warning, a massage will be sent to drivers registered number and nearest police station that vehicle has crossed the speed limit and automatic challan will be generated. The model was tested on a brushless dc motor to check whether the speed of the motor is varying with speed zone. After starting the system we observed that speed of motor is varying speed zone.

Keywords: Automatic speed control, Automatic Challan System, GSM Module, IR Sensor, RF Module

1. INTRODUCTION

THE increase in number of automobiles on the road it is not possible the monitor all area and speed zones. Most of the accidents are supposed to occur in these areas. Because the traffic police cannot go everywhere means it is difficult to control people to over speed. They do not bother about human lives [1] so the project provide a technique to control the speed of the vehicle to a certain limit in restricted area. There are many techniques available to avoid accidents like blink preventing, cruise control (cc) [6] or Adaptive cruise control (ACC) [3]. So to prevent accident due to rash driving we are proposing this project. Here IR communication method is used to detect and control over speeding. To implement this system transmitter will be attach in side of the road and receiver will be attached to vehicle which is to be controlled in the restricted speed zones. When a vehicle passes through this zone a signal will be sent by transmitter and the signal will be received by receiver which will be installed in vehicle. We are performing this project on a motor so that the motor is connected to a circuit bridge which is connected to microcontroller. The programming in the microcontroller will control the speed of the motor according to the speed zone. The aim of the research is to control the speed of the vehicle to avoid rash driving and to avoid any kind of collision between vehicles. The automatic speed control and automatic challan system is represented by electrical circuit and component while an electrical D.C. motor is indicating the speed of the vehicle. We have chosen to construct an electrical circuit model instead of mechanical system for the purpose of simplicity and portability.

2. WORKING

The module uses in the project are: IR sensor or Tran’s receiver, receiver modules and RF transmitter. [2] These modules are used to control speed and establish the wireless communication. The whole system is being controlled by a unit called microcontroller to which a DC motor is connected by an H-bridge through which the speed of the motor is controlled. A GSM module also connected to the circuit which is also controlled by microcontroller. In the project we divided the speed zone into 3 zones low speed zone, medium speed zone & high speed zone. When any vehicle enters in this zone then according to the zone divided the speed of the motor varies a signal is sent to the microcontroller by IR sensor which further execute the command and send it to H-bridge and the speed of the motor can be controlled. In the project we also propose an automatic challan system using GSM module, in the GSM module there will be a sim slot in which we have to insert a sim card and also we have to register a mobile number in the sim so that message can be sent to the other mobile number in the form of challan. When sensor detect the over speed means high speed it sends signal to the GSM module and it will be also shown on LCD after that a massage will be sent to the registered number that you crossed the limit. And an automatic challan will be generated. Whenever the vehicle is within the transmitter zone, the vehicle speed is controlled by receiving the signal, i.e. every time the vehicle speed is decreased by some cutoff and kept constant until the vehicle moves out of the transmitter zone, and then the vehicle can get accelerated by itself. The IR sensor detects if any other vehicle is increasing its speed and the distance between the vehicles is to be maintained and controlled. Until the vehicle moves out of the transmitter zone, and then the vehicle can get accelerated by itself. The IR sensor detects if any other vehicle is increasing its speed and the distance between the vehicles is to be maintained and controlled.

3. MODES OF OPERATION:
In our project we are proposing an automatic speed controlling method despite of this we are also providing a manual mode of
operation so that if there is any emergency the speed will be not controlled.[5]

1. Automatic mode

2. Manual mode

We have divided three zones of three different speed limits. The three zones having speed limit 30, 50, 70 km/hrs. Respectively. Three sensors are placed in these zones which detect any vehicles crossing at different speed and if the speed is over the specified speed limit the circuit enacts and lower the speed of motor to the given speed limit which is represented in our project but in actual practice engine rpm and speed of wheels are controlled. We have also added a challan system for vehicles in which automatic speed controller kit can be installed in the case vehicle owner number would be registered in RTO and a self-generated SMS would be sent

4. MICROCONTROLLER 8051

It includes most of the necessary chip on-board. The Intel MCS-51 [4]use in embedded systems. [This family of microcontroller is digital in nature means these controllers understand only two logic level that is either 1(+5V) or 0 (0V). It can take only digital input and generate digital output. 8051 is a series of microcontroller in which architecture design is same with the different series controllers having certain advance features and different memory mappings for different memory elements. The 8051 is the basic controller of this series. It consists of C-series (as ATC51 and many more), S-series (AT89S8253 and more) [7] and many more controllers. For interfacing Analog you have to externally interface ADC’s in these microcontrollers. The execution speed is however is in micro-seconds but with reference to other microcontroller family.

5. ARDUINO 168 G

The Atmel ATmega48/88/168 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega48/88/168 achieves throughputs approaching 1 MIPS per MHz allowing the system designed to optimize power consumption versus processing speed [8].

An Arduino board consist of an Atmel AVR microcontroller and complementary components to facilitate programming and incorporation into other circuits. Each board includes at least 5-volt linear regulator and a 16MHz crystal oscillator. The microcontroller is pre-programmed with boot loader so that an external programmer is not necessary.

6. ATMEGA 168

In the project ATMEGA 168 controller is used. It is digital as well as analog controller. It has 23 general I/O lines, a 6 channel 10-bit ADC (analog input) 6 output PWM channels (analog output) a serial programmable USART these allows very fast startup with very low power consumption [9]
9. FEATURES

i) **Real time system:** -
The whole system works in real time with fast sensing and executing the command very quickly and in real time.

ii) **High Speed:**-
The execution speed is in microsecond despite of the other microcontroller family.

iii) **Low operate power, easy to implement:**-
ATMEGA 168 is require to low power and easy to implement so system is very simple.

10. APPLICATIONS:

i) **Automobiles:**
In automobiles there are many scopes. In upcoming years we can see the increase in use of E-vehicles. Where this technology will be very useful. In gearless vehicles it is very useful.

ii) **Industrial Purpose:**
In industry with certain change in programming in the microcontroller we can control the speed of the machine or stop it to avoid any accidents.

11. RESULT

The speed of the motor is controlled in the three given zone low speed, medium speed and high speed. High speed detected and automatic challan generated on the basis of zone speed and also the “over speed detected” will be shown on LCD.

12. CONCLUSION

The propose project is not only limited to controlling the speed of the vehicle but it can also be used in other ways. To avoid rash driving and accident it is necessary to implement some technology. This can be done by controlling the speed of the vehicles. So we proposed this model to control the speed of the vehicle in the different zone and also generating the automatic challan on the basis of speed. This method will work effectively in high speed electrical vehicles in upcoming days.

13. REFERENCES


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