

# AUTOMATIC SPEED CONTROL OF VEHICLES IN SPEED LIMIT ZONES USING RF AND GSM

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**Abstract:** - *This paper aims to control the speed of any vehicles automatically in cities and also in restricted areas such schools, parks, hospitals and in speed limited areas etc. Nowadays in a fast moving world people do not have self-control. Which leads to accidents. So it is difficult for the police to monitor all the accidents. This paper provides a way to control the speed without harming others. Driver does not control anything during such places; controls are taken automatically by the use of electronic system. In this project we RF for indicating the speed limit areas it is placed at the starting and end points of the restricted zones. RF receiver is placed inside the vehicle. Speed is acquired by the help of speedometer in the vehicle. The controller compares the speed. If it exceeds the limited speed the controller alerts the driver and control is taken automatically. If they does not respond that message an information along with the vehicle number is transmitted to the nearest police station by the use of GSM and penalty amount is collected in the nearest toll gate.*

**Keywords-**RF transmitter and receiver,  
Controller unit, GSM module.

## I.INTRODUCTION

At present accidents are mostly occurs due to rash driving and over speed in road. People do not bother about human lives. The accidents rates are increasing year by year. The government has taken to many steps to prevent this kind of Things but it not enough. Most of the manufactures has developed a laser based control system but its cost is too high. But it is again a difficulty when human crosses the road it cannot detect properly so we tried to develop a system to control these things in a simple manner. At first we have an idea to use laser diodes but it was costly so we go for IR module again there is a draw back in using this it works under line of sight so finally decided to use RF.RF transmitter is in the road zone areas and receiver is placed in the vehicle. Then it transfers the information to the controller. The current speed will be monitored by the separate module or by the use of ultrasonic sensor that also sends information to controller. The controller compares both speed and the driver does not decreases the speed the control transfers automatically but the driver again operate it manually and exceeds the limited speed means the information transferred to the nearest police station. The information contains the current speed and registration number of the vehicle. The controller transmits the information with the help of GSM module.

Then the penalty amount is paid by the owner.

## II.LITERATURE SURVEY

**Qingfeng lin et al Proposed Vehicle-to-Infrastructure Communication based Eco-Driving Operation at Multiple Signalized Intersections.** In this paper the Author states **LPS (Legendre pseudo-spectral) method.** It is based on the significant fuel benefit for road transportation. An optimal control problem(OCP) is formulated to minimize fuel consumption. It is found that optimal driving operation falls into either two-stage or three-stage mode. In this method the fuel consumption is only reduced but the speed of the vehicle doesn't vary.

**Rafael Basso et al Published Traffic aware electric vehicle routing.** In this paper the author proposed a Route optimization model for Electric commercial vehicle. This method impacts Distance minimization, acceleration and weather conditions. This model based on several important factors such as road inclination, weight and speed. In this way it will be possible to test larger instances of the problem, including real world cases and improve the significance of the results.

**Maria Spichkova et al Proposed Formal models for intelligent speed validation and adaptation.** In this paper the author describes an algorithm **ISA (Intelligent Speed Adaptation).** It is fully autonomous driving where the vehicle itself is the intelligent subject on the road. It approaches on formal modelling of the corresponding smart vehicle units, to increase the road safety as well as to allow formal analysis of smart vehicle behaviour. It suggest a model for speed check,

limitation units, which reflect differences in the speed limit in several countries.

**Magnus HJALMDAHL et al Published Speed Regulation by In-Car Active Accelerator Pedal.** In this the author describes about an algorithm **AAP (Active Accelerator pedal).** This algorithm is mainly due to the decrease in speed of the fastest vehicle but there was also an effect from an increase in speed of the slowest vehicles. The effects were largest on arterial roads where the vast majority of injury accidents occur. With the help of AAP the accidents were controlled.

## III.PROPOSED METHODOLOGY

This paper aims at automatically controlling the speed of vehicles at speed restricted areas such as schools, hospital zones etc. The RFID reader is attached along with the vehicle and the RFID reader Tag with these zones. These tags are programmed to send a coded signal when the reader comes in proximity. Whenever the vehicle enter into these zones their receiver will receive this code and the speed of the vehicle is controlled automatically with the help of the micro controller unit present inside the vehicle.

## IV.RF MODULE

RF transmitter and receiver needs power source or battery power for operating and it can be usable for a long period over more than decades. It has an inbuilt short range antenna or we can use handheld antenna. The antenna type used in the RF module has a scanning antenna. The scanning antenna just release the signal and it is in short range. Whenever an RF receiver come across the transmitter devices the information transmitted by the transmitter is passed to the receiver

module placed in the vehicle will get the signal.

**A. Transmitter Modules**

An RF transmitter module is a small assembly it can able to transmit the radio waves. This is working along with microcontroller. This is used to give data to module which can be transmitted. Transmitter power output can be decreased by the physical environmental changes such as harmonics, noise and so other parameters. so we can take a necessary steps to overcome this to make transmitter to increase or maintain the quality.

**B. Receiver Modules**

An RF Receiver module receives the modulated RF signal, and demodulates it. There are two types of RF receiver modules: 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. Super-regenerative modules are generally imprecise as their frequency of operation varies considerably with temperature and power supply voltage. Super heterodyne receivers have a performance advantage over super-regenerative they offer increased accuracy and stability over a large voltage and temperature range. This stability comes from a fixed crystal design which in turn leads to a comparatively more expensive product.

**V. CONTROLLER UNIT**

**A. Transmitter**

The diagram shown below (see Fig. 1). Is the transmitter which is placed in both edges of the speed limiting areas. This unit simply contains the information of how much the vehicle speed in that region that can be decided based upon the needs. The controller is used to transmit the

information through RF transmitter to a multiple receiver.



Fig. 1. Transmitter block diagram.

**B. Receiver**

The receiver block diagram is shown below (see Fig. 2). The receiver is used to acquire an information from the transmitter based on the information it received it controls the speed of the vehicle. The receiver modules consists of RF receiver, LCD display, and GSM modem, motor. LCD is used to shows the information to the driver who drives the vehicle. Here the GSM plays an important role. When the driver does not reduce the speed manually it wait for few seconds after that the control goes automatically and the information is transmitted to the nearest police station.

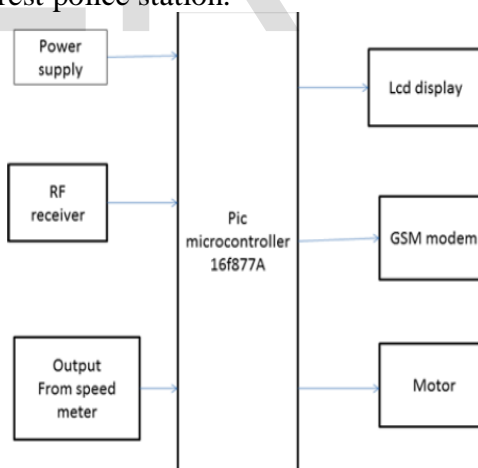


Fig. 2. Receiver block diagram.

**VI. WORKING**

When the vehicle enters in the normal area it speeds does not decrease and it goes normally no action is performed. When the vehicle enters into the restricted areas that means it enters into

the speed limiting. Whenever it enters the transmitter module just send information that contains how much speed a vehicle can go inside the speed limited region. Then the signal or information is received by the receiver and the signal acquired from the speed meter is also given to the controller. The signal is basically analogy in nature that will be converted into digital so only the micro controller able to process the signal. The signal from the transmitter and the speed meter is compared by the controller. In this there are two cases: first, the current speed is less than the transmitted speed the vehicle goes normally no action is required. Second, the information from the speed meter is greater than the transmitted speed by the transmitter module the controller waits for few seconds whether the driver reduces the speed to the below value. If the driver does not reduce the speed means it automatically takes the control and reduces the speed according to it. At the same time the information is transmitted to the nearest police station. The information contains the vehicle number and the time. The time denotes that at which time the vehicle crosses that area. Then the fine or penalty amount is collected by the nearest tollgate or the check post. After that at the end of the speed limit area there is another transmitter that contains a stop information means the control releases by the controller to driver.

The flow diagram figure 3 shows the system working during initial stage the system acquires the speed limit on the road lane then it compares with the speed of the vehicle. If it is less than the lane speed no action is performed. On the other hand if the speed is greater than the lane speed a warning signal is given to reduce the speed. If there is no decrease in speed the information is recorded to the police station.

Flow Diagram`

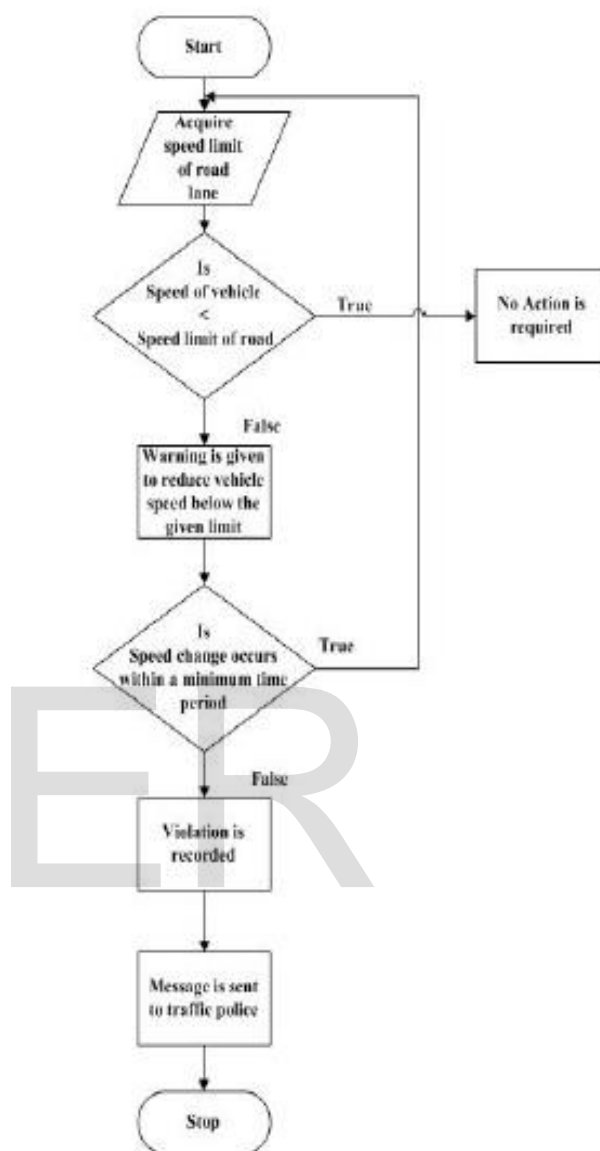


Fig. 3. Flow Diagram

### VII.CONCLUSIONS

In this paper we developed a new design to control the speed of the automobiles. In normal driving mode, we can expect other vehicles interfering nearby and possibly blocking or attenuating RF signals. In this aspect, we are going to use GPS location for restricted areas.

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