# AUTOMATIC SPEED CONTROL OF VEHICLES IN SPECIALIZED ZONE USING BEACON

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***Abstract—*** *The road transportation is the major transportation in India. Since many people use road way there are many tough roads. According to the MVACT 1998, section 112, the vehicles that should follow only the regulated speed when there is a speed limit board in any specific region. Our traffic system has very minor control over vehicles, hence it is significant to control the speed of the vehicle in many areas such as school regions, hospitals and so on but still they need a change in the controlling system in the areas like high ways and fast lane in metro cities. To make all the possible gradual decrease of speed control is essential to monitor. In order to reduce this, we have proposed a steady speed limiting system by using beacons to connect the controlling system and the vehicle that are done automatically. So, that the vehicle control is done at higher rate. System fixed over both the sides will enhance the proper and regulated controlling.*

***Keywords— Beacon; Speed Control; Range; Road Side Device; Alcoholic Sensor; Limiter; Sensing***

## 1. INTRODUCTION

The primary view is to design an intelligent speed limit indicator at danger zones. A speed controller is installed in the vehicle and is guided by a beacon fixed in the speed limit indicator. Accidents due to drink and drive can be prevented by using alcoholic sensor to find drunken driver and stop his vehicle. The device is set up as the receiver in the vehicle and there is transmitters where there can be multiple devices are paired to control the speed of the vehicle when they enter into the monitored region. Thus, the limited speed is set as Predefined value so, the vehicles that exceed those fixed speeds will be controlled automatically. Hence this system provides the overall control of the covered region. People who drive should not consume alcohol and then it is also important to detect the alcohol consumption by using the sensors.

## 2. PROBLEM STATEMENT

The speed limiters are used in specific area but there are done only one by one. That may cause the skipping of some vehicles over the area region also, the vehicle's speed that are reduced suddenly will lead to some mal function in the fast-moving vehicles. The control region also differs but the speed control is made constant is also the major problem where the alcohol detection is another important factor to avoid accidents.

## 3. CURRENT ISSUE

The existing methods use the RF transmitter antenna to send information of speed limit. The Receiver setup in vehicle sense the radio signal if it enters the specific zone. Then the speed of vehicle is limited by motor drive IC. The main drawback of this system is the transmitter can connect with only one device at a time. For the detection of alcohol by alcohol sensor is implemented.

## 4. LITERATURE SURVEY

From the literature survey, we have selected the base paper entitled as "Automatic Vehicle Speed Control with Wireless In-Vehicle Road Sign Delivery System Using ARM 7"*(*International Journal of Technology Enhancements and Emerging Engineering Research, Vol 2, Issue 8 ,2014*)*. It is the method of RF signal transmitted through the antenna signal and received by the vehicle entering the region but they are allowed to pair to only one device. The paper titled as "Risky Driver Recognition Based on Vehicle Speed Time Series *(IEEE 2017 Transactions on Human-Machine Systems (Volume: PP, Issue: 99)).* Where this paper describes that speed of the vehicle is monitored and is controlled from over speed. The paper entitled as "Vehicle Speed Control System Using GSM/GPRS" *(International Journal of Computer Science and Information Technologies, Vol. 4 (6), 2013).* It is the project that enable two kind of provisions Uses the vehicle tracking system to track the current location and speed of the vehicle and in accident prone zones, speed of vehicle is limited remotely.

## 5. EXISTING METHOD BLOCK DIAGRAM

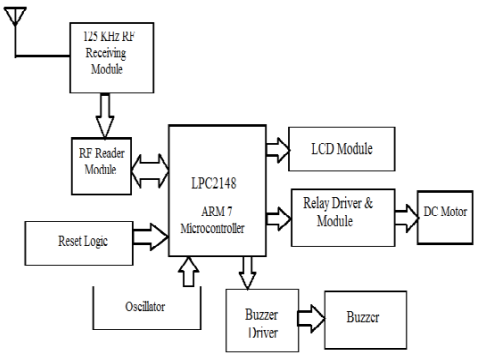


Fig.1 RF block setup

The receiving section has road sign ID chip and RF transmitter antenna which are fixed on the road side will pair with the vehicle with high speed a hence they are transmitted by antenna will suffer from definite losses and they cannot change with the mobile nodes suddenly from one device to another. The receiving block has the function that can be done with the RF reader. which reads the information from the tag over devices that are controlled by the microcontroller along with the additional necessary components. The time synchronization is necessary in this approach. The pairing is most important where it is not predictable. But once it is paired it needs the termination control. Every time when it request for the termination it causes the mismatch in the connection system.

## 6. PROPOSED SYSTEM

Fig. Device in road side

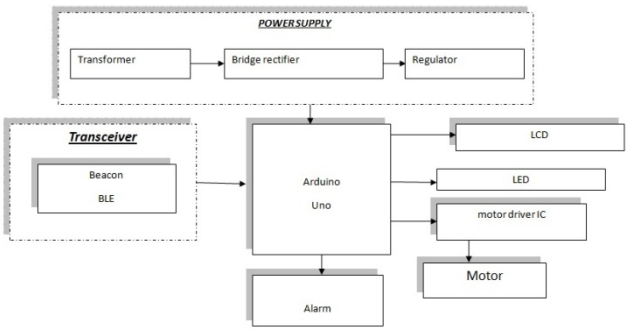


Fig.2 Device in vehicle

The beacon setup repeatedly transmits a single signal that other devices can see. Instead of emitting visible light, though, it broadcasts a radio signal that is made up of a combination of letters and numbers transmitted on a regular interval of approximately 1/10th of a second. A Bluetooth-equipped device like a smart phone can get the alert range beacon once it's in range. When the vehicle enters the
range of the signals from transmitter device over the lane it connects via the proper authentication of the registered information by matching the devices between the receivers to transmitter. Once the transmitter found the proper authentication and then it pairs with the device from the range that before it enters the limit. Established connection will control the rate of speed on the vehicle. The receiver circuit is enabled with the beacon Bluetooth device which is connected by the interface of an android application through a mobile device. Which automatically turns on the notification which controls the motor enabled with switches and maintains it till the connection terminates.

## 7. WORK AND PROTYPE

The beacon setup is provided in the starting of the lane so that the control for the vehicles starts to decrease from the point of entry. Since the control of speed experiencing sudden decrease would cause mal function in engine so the gradual decrease in important so the area that limits speed should be installed with initial device which would range before it comes under the limit. Then the authentication process starts to pair with the device. The last four digits for the security purpose is enabled as the information key for pairing.

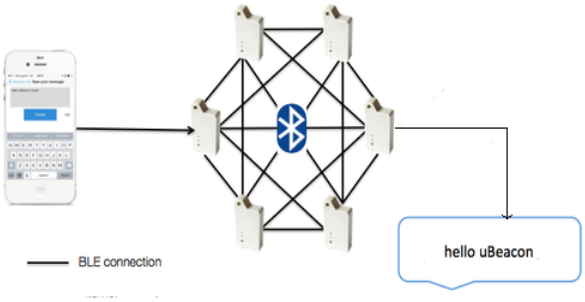


Fig.3 Paring of beacon with mobile device

This involves in the connection of analysing and controlling devices is one to many, beacon enables connection of master and slave. It also chooses the mesh type network. The live notification and pairing details are shown in the mobile application. It can be stored for the further using and automatic detection for the next time usage. The android application consists of detection and pairing where the authentication is the major role of that process and to work as the mesh network. This will have the efficiency to connect in any high speed. This node will act as the slave node until it travels between the range of the master (transmitter).

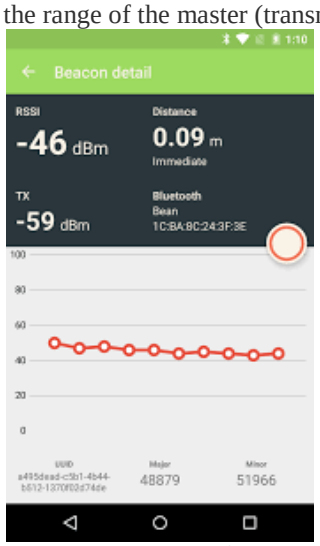


Fig. 5 Mobile app notification

DC motor speed control is one of the most useful features of the motor. The speed control mechanism is applicable in many cases like controlling the movement of vehicles. Once the limit range is high then they automatically indicate to the DC motor and it will reduce the speed in steady state. The alcohol sensor detection is important. When the alcohol sensor senses the detection and the range for alert is identified it automatically confronts the motor to speed zero. The vehicle is stop immediately. The sensing range values

are programmed and when that goes high the logic 1 is given as output to the motor that will reduce the speed to zero. So, the person will not be able to start the vehicle. This is one of the necessary feature for safe travel. Working Principle of alcohol sensor is that the MQ-135 alcohol sensor consists of a tin dioxide (SnO2), a perspective layer inside aluminium oxide micro tubes (measuring electrodes) and a heating element inside a tubular casing. With the ethyl alcohol cascade on the tin dioxide sensing layer, the resistance decreases. So that the value goes high and control over the motor is done. These sensor output is directly connected to the motor that controls the speed of vehicle. It automatically slows down and reaches zero speed. The detection is always on, whenever the driver gets in it again checks whether there is the sense of alcohol detection.

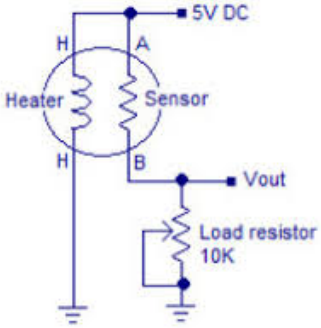


Fig .8 Alcoholic Sensor

## 8. PROGRAM FLOW


```
void loop() {
  long duration, distance;

  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);

  distance = duration /74 /2;

  Serial.print(distance);
  Serial.println(" inch");

   if(distance <= 12)
  {
  digitalWrite(buzzer, HIGH);
  digitalWrite(led, HIGH);
  }else
  {
    digitalWrite(buzzer, LOW);
    digitalWrite(led, LOW);
  }
```

Fig. Program-alarm for range indication

Once the vehicle enters the range of the transmitting signal they will enable the initialized loop from the declaration. The analysed details and pairing control is enabled when the main loop executes after the detection of connection establishment between the road side device and the vehicle is enhanced as the priority one control. Alcoholic sensors has been in global declaration which first runs only if the test case passes with the loop as zero, then the main program loop runs for further process of the program.

## 9. OUTPUT AND DISCUSSION


The motor runs through the ARDUINO IDE, the range of the speed from the road side device is enabled then it automatically signal is passed to the motors control. Both the program make an interface between them. When the sensor for alcohol loop is passed after the values only then it automatically reduces the speed. The main control loop in the program is interfaced only along the motor output. Results are obtained over the motor control and then indication for the danger lights are enabled through the motor but only as the third priority of the loop

## 10. CONCLUSION

Implementation of speed controller and the alcoholic sensors will enable the efficient way of controlling and sustaining all zones automatically. The connection ranges from every 30 m wide is fixed and thus the variable range will give supplementary increase in fixing the device over which will enable the long-distance coverage. The GPS enabled control further will help the people to know earlier can be added as the future implementation along with system. Even the beacon can be provided with information such as hotels nearby, hospitals and also indicating the type of zone the vehicle enters that is the school zone, hospital zone and so on. The toll gate system and information to the toll station can also be given earlier by the connection of the entire system with internet with proper encryption will provide many advanced control and for multiple purpose utility. Thus this system along with the implementation of further development will give will defined and controlling system.

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