SMART ZONE BASED VEHICLE SPEED CONTROL AND OBSTACLE DETECTION

Pradip S. Bhendwade¹, M Sankar², Abhijeet D. Gund³, Arvind A. Patil⁴, Prashant P. Patil⁵, Sumit A. Desai⁶

Dept. of Electronics and Telecommunication Engineering, Ashokrao Mane Group Of Institutions, Vathar Affiliated to Shivaji University, Hatkanangale, Kolhapur.

[1] ABSTRACT:

This paper presents smart zone based vehicle speed control using RF and Obstacle Detection and Accident Prevention system. Whenever the vehicle is within the zone, the vehicle speed is controlled by receiving the signal, i.e. every time the vehicle speed is decreased to some cutoff and kept constant until the vehicle moves out of the zone, and then the vehicle can get accelerated by itself. Detects Obstacles and prevents Accidents by Stopping Vehicle.

Keywords: Smartzone based vehicle

[2] 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 rate are increasing year to year by more vehicles on the road. Vehicle Speed Limit Controller Project is a great solution to this problem as it not only provides speed limitations, it also implements it through a controlling mechanism. The project works with RF communication between the speed sign post and the vehicle controller system. A motor is used here to depict as a vehicle. Whenever a vehicle comes in range of the RF speed sign post, the sign post transmits the speed limit for that particular road to the vehicle system. The vehicle controller system receives this signal through RF receiver and further perceived by the microcontroller. The speed of the vehicle can be incremented decremented manually with the help of push buttons. If the system was at lower speed than the limit received from the sign post than there will be no changes made to the speed of the system. However, if the speed of the vehicle was manually incremented to a higher value, then the controller will impose the speed restriction and bring back
SMART ZONE BASED VEHICLE SPEED CONTROL AND OBSTACLE DETECTION


the speed value to the value specified by the limit. Now if the user tries to increase the speed, the system does not allow it to do so till it is in range of the RF speed sign post. The speed of the vehicle and the limits are displayed on an LCD.

[3] LITERATURE REVIEW:

Chomtip Pornpanomchai, Kaweepap Kongkittisan: According to their project this project intends to develop the vehicle speed detection system using image processing technique. Overall works are the software development of a system that requires a video scene, which consists of the following components: moving vehicle, starting reference point and ending reference point. The system is designed to detect the position of the moving vehicle in the scene and the position of the reference points and calculate the speed of each static image frame from the detected positions[1].

Rajesh Kannan Megalingam, Vineeth Mohan, A smart traffic controller is designed using wireless sensor network that not only performs efficient traffic routing but also track over speeding vehicles. MicaZ motes (MPR2400, a 2.4 GHz IEEE 802.15.4, Tiny Wireless Measurement System (TWMS)) from Crossbow are utilized for this purpose. A gateway hardware and Data Acquisition Card (DAC) is employed to acquire, transmit and receive data. Over speed detection unit comprises of a microcontroller for interrupt generation and speedometer simulation. MatLab is used to process the acquired data. TinyOS v1.11 and cygwin is used for configuring the motes. Xsniffer from Crossbow is extensively used for packet sniffing. The paper analyzes and describes the entire software and hardware setup, the algorithms used, and the merits and constraints of the system. It also covers the demonstration model prepared to strengthen the theoretical model[2].

Wang Hongjian, Tang Yeulin: RFID is non-contact automatic identification technology which could be applied to various industries extensively. Accessing the vehicle speed in freeway, we could use RFID technology to manage vehicles. Then we determine whether the vehicle are over speed. Therefore the use of RFID technology can effectively reduce speeding violations and enhance traffic safety. It’s toll is paid by credit card automatically through computer network. Therefore, realize non-stop automatic toll collection. Contrarily, punish the illegal vehicle by monitor network [6]

[4] PROPOSED BLOCK DIAGRAM:

A. RF Transmitter:

B. RF Receiver

[5] BLOCK DIAGRAM DESCRIPTION:

The project works with RF communication between the speed sign post and the vehicle controller system. A motor is used here like as a vehicle. Whenever a vehicle comes in range of the RF speed sign post, the sign post transmits the speed limit for that particular road to the vehicle system. The vehicle controller system receives this signal through RF receiver and further perceived by the microcontroller. If the system was at lower speed than the limit received from the sign post than there will be no changes made to the speed of the system. However, if the
speed of the vehicle was manually incremented to a higher value, then the controller will impose the speed restriction and bring back the speed value to the value specified by the limit. Now if the user tries to increase the speed, the system does not allow it to do so till it is in range of the RF speed sign post. The speed of the vehicle and the limits are displayed on an LCD. The IR sensor detects if any obstacles occur and send to the controller.

The modules in the project are: RF transmitter and receiver modules for establishing wireless communication, DC motors for the movement controller, IR sensor for Obstacle detection. The controlling device of the whole system is a Microcontroller to which RF receiver module; DC motors are interfaced through a motor driver. The Microcontroller checks the data with the program embedded in it and performs appropriate actions on the electric DC motors. The Microcontroller is programmed using Embedded C language. 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 obstacles occur and send information to Micro controller. Micro controller interacts with motors through driver IC to take appropriate directions to prevent accidents.

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.

[7.2] 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.

[8] CONCLUSION:

In this project we present heavy traffic zone accident preventions technique in the real world. It has been mainly designed in order to avoid accidents and to alert the drivers about the speed limits for safe travelling. It can be utilized in special areas with sudden sharp & high curve and thus accident are prevented in old bridges and Ghats section. It is used to control the speed of the vehicle in hospital, school, and work zones. Accidents can be prevented which are caused by the negligent driving or speeding of the user. Heavy traffic zone are schools, hospitals, Highways, U-turn etc. There the Vehicle speed can controlled automatically without the help of the driver. At the same time it detects obstacle and stops the vehicle, so that accident will be prevented.

[9] REFERENCES:


[3]. TurgayCelik and HuseyinKusetogullari, “Solar-Powered Automated Road Surveillance System for Speed Violation
SMART ZONE BASED VEHICLE SPEED CONTROL AND OBSTACLE DETECTION


