Zone Based Automatic Speed Controller

Prof. Komalakumari, Theerthesh G K, Lincy W S K, Akayla Dhananjay, Ravi Kumar N

[a] *Professor, Vidya Vikas Institute of Engineering and Technology,Dept. of ECE,Mysore,India 570011,*
[b]*Student,Vidya Vikas Institute of Engineering and Technology,Dept. of ECE,Mysore,India 570011,* [c]*Student, Vidya Vikas Institute of Engineering and Technology,,Dept. of ECE,Mysore,India 570011,* [d]*Student, Vidya Vikas Institute of Engineering and Technology,,Dept. of ECE,Mysore,India 570011,* [e]*Student, Vidya Vikas Institute of Engineering and Technology,,Dept. of ECE,Mysore,India 570011.*

Abstract: Road accidents generally occur owing to drivers' excessive speeds which often lead to loss of property or even casualties. Given this, everyone who drives must practice road safety, especially in high-risk areas where there is a greater chance of losing possessions or even life. Recent polls show that over the past few years, accidents near hospitals, schools, and abrupt turns have significantly increased due to people's hasty attempts to reach their destinations. Controlling vehicle speed has therefore been an important factor to take into account. Despite all the assistance provided to drivers, such as the implementation of traffic laws, and efforts like the use of speed limiters for speed regulation in critical zones, there is still a need for improvement. The project aim is to solve the problem by having a speed-limiting control system that would act upon driver's carelessness especially in critical zones. The proposed system will make use of the global Positioning System (GPS) technology to determine the location of critical zones and automatically adjust the speed of the vehicle once it reaches the speed limit.

I. Introduction

The current speed of the vehicle is sensed by the dc motor and the output of it was given to the microcontroller where it compares the speed with the prescribed limit and the speed is controlled automatically. The technology used in this system to communicate between transmitter and receiver is Zigbee technology, which covers up to 10-100m within its range. This is comparatively cheaper than others. But there we have to apply the supply power frequently to reduce that here we are going to present a new model such that by using its location we are going to control the speed of the vehicles. By implementing this system, the accidents are reduced in this fast-moving world. In the developed and developing countries, people finds inconvenience with the road accidents, jamming of vehicles because of the drivers who dislike to obey the laws at the restricted zone, where the speed has to be limited as prescribed in that zone by using an automated speed control system to limit the speed automatically using GPS technology Rash driving makes city roads unsafe. In present days, rash driving and over speed are the major moving traffic violation. This research aims to implement an effective solution to the given problem by automating the control of speed in vehicles when they reach critical zones through the use of GPS and GSM. The speed of the vehicle at the critical zone will be compared with the maximum allowable speed and will be adjusted accordingly by the system which will depend on the sent coordinates by the GPS & GSM modules.

II. Literature Survey

The purpose of this literature survey is to study the Zone Based Automatic Speed Controller. To know more about the alternative solutions that are implemented instead of our proposed model related literature review and to get the knowledge about the different technologies that are implemented to design a system.

[1] Zone Based Vehicle Speed Controller; Venkatesh Prasad K M1, Dinesh S2, Vijayaragavan S3; June 2017 To control the speed of the vehicle in speed limit zones, the drivers are alerted that they are in a speed limit zone by sign boards nearby roads. In case of not controlling the speed manually the speed will be controlled automatically by the zone-based vehicle speed controller and also the ahead of speed limit zones will be indicated before 5 meters in the vehicles display.

---

[2] Automatic speed control of vehicle in speed zones using RF and; S. Saranya M. E. Issued on 7, July-2017. 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, RF used for indicating the speed limit areas it is placed at the starting and end points of the restricted zones. The car is equipped with an RF receiver. The speedometer in the car is used to measure speed. The speed is compared by the controller. If the speed is exceeded, the controller warns the driver and takes over control immediately. If they don't answer to that message, information about them and their vehicle is sent over GSM to the closest police station, and the fine is paid at that gate's toll booth.

[3] Assistant Professor Ankita Gandhi, Dhrumil Nanavati, Tushar Mandloi, Gaurav Sagar, and Dhruv Sevak; Automatic Speed Controlling System Using IoT; March 2021 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 speed restriction is set using a microcontroller, which is combined with the transmitter unit that sends the signals using an antenna and is picked up by the receiver built into the car. The improved smart zone speed management of cars is suggested in this study with the goal of preventing accidents. High performance hardware is provided compared to current techniques. Consequently, a technique for preventing accidents that is both dependable and affordable is provided in this work.

[4] K.N.V. Satyanarayana; August 2018; IOT Based Vehicle Speed Control Automatically in Restricted Areas using RFID. In this study, we use an RFID module to control the speed of the vehicle. The RFID receiver should be installed inside the vehicle, and the RF transmitter will be placed at the first and last of the restricted regions. The speedometer of the car was used to determine the speed. Automatic speed reduction occurs if the vehicle's speed exceeds the limit. A switch will be present in the car in case of an emergency. The speed is not automatically controlled when the switch is ON. The car number that is now switched on was saved in the cloud. Our upcoming installation aims to incorporate all of these cloud and without the use of physical components, we will automatically monitor the entire operation. Additionally, we are attempting to integrate a SQL database so that we can store zone-specific data.

[5] Automatic Sign Board Speed Limit Detection and Vehicle Retarding System by Naveen Babu in April 2016. The speed restriction will be detected by a sign board detecting software system in the automobile, which will alert the driver to reduce speed. This article discusses accidents and how to avoid this problem.

Summary of the Literature survey
The outcome for the literature survey are as follows:
1. Use of available technology in a good combination can build a cost efficient and best performing electronic system for our use.
2. Different types of methods presented for controlling the vehicles speed like RFID based, image processing based and GPS based.
3. High frequency RFID's are very expensive and maintenance is bit thought.
4. And RFID transmitter requires frequent charge so. The charge is wasted when there is no requirement of it.
5. Since maintenance of RF transmitter in each zone in the both starting and ending of the zone is difficult in the public place since it is expensive.
6. GPS system is an available resource which can be used in tracking location of the vehicles and can be easily used in this project.
7. So, by the survey of different methods to control the speed of the vehicle GPS based zone detection and speed monitoring system is the best way.
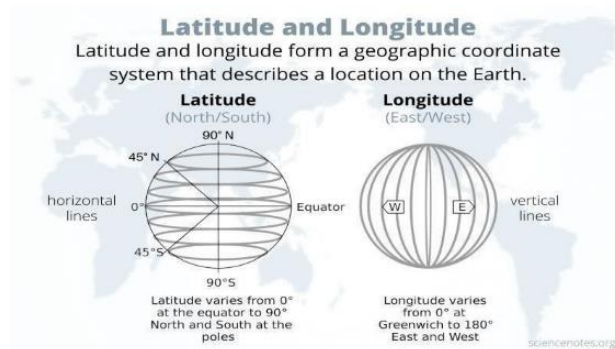
III. Methodology

Figure 1. Latitude and Longitude of geographic coordinates

The proposed prototype model is GPS based vehicle speed controller. As discussed earlier it is one of the best methods for controlling the speed of the vehicle. As it does not need any receiving signals at the restricted zones. Here we are considering the longitude and latitude of zones at the starting point and the ending point of the restricted zones by using the GSM module here we are using Ublox M8N GPS for the detection of restricted zones.
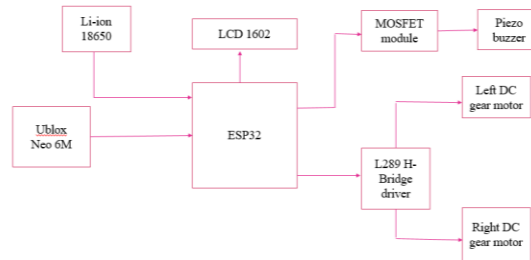

Figure 2. Block diagram of Speed Controller

And we are giving one push button for medical emergency case and we are connecting potentiometer for acceleration of speed of the vehicle and we are using dc geared motor and horns. Here our main aim is to reduce the speed of the vehicle in the restricted area by using GPS location of the vehicle. If vehicle location is in restricted area, then its speed has to be switched automatically and if it is in non-horn zones vehicle horn is disabled but keeping the requirement of horns if it required in that zone then sound of the horn is reduced by connecting the different voltages for the horns.

Steps Involved in the Working are:
Step 1: Start
Step 2: Define the longitude and latitude of the location
Step 3: Track the current location
Step 4: If current location is equal to the longitude and latitude of the zone
Step 5: If the speed of the vehicle is less than the maximum speed of the zone
Step 6: Then there is no changes in the speed of the vehicle
Step 7: If the speed of the vehicle is greater than the maximum speed of the zone
Step 8: Then automatically the speed of vehicle is controlled
Step 9: If the vehicle is in the restricted zone Step 10: Then horn is enabled
Step 11: Stop

IV. Results and Discussions

The data gathered in a zone-based speed controller project that makes use of GPS typically consists of the vehicle's position, speed, and the zone-specific speed limit. The control system calculates the zone based on the vehicle's position and matches it with the appropriate speed restriction for that zone using location data collected by the GPS receiver in the car. The control system uses the GPS data in real-time and constantly checks the vehicle's location and speed to make sure the posted speed restriction is appropriate for the area it is in. The technology may alter the speed limit in real-time to best suit changing traffic situations thanks to the usage of GPS data for traffic flow and minimize congestion.
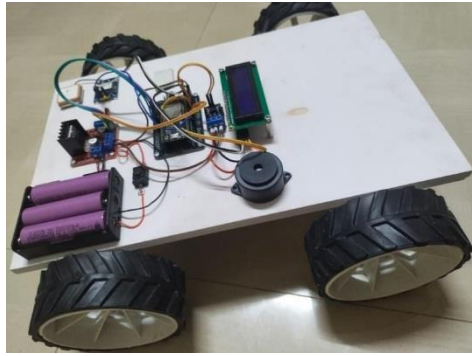
Fig 2. Proposed Model of "Zone Based Automatic Speed Controller"

Result Analysis

School, College Zone Latitude & Longitude Values		Inside zone or not	Speed		Horn Sound
Latitude	Longitude		Present	Switched	
12.304300	76.710400	Yes	60	30	Low
12.303100	76.709700	No	50	No change	High
12.304300	76.711100	Yes	30	30	Low
12.303100	76.710200	Yes	50	30	Low
12.277400	76.629900	No	65	No change	High
12.304000	76.709900	Yes	60	30	Low

V.   Conclusion

In conclusion, creating a zone-based speed controller with GPS technology could be a viable way to lessen overspeeding-related traffic incidents. The GPS coordinates of the vehicle are used by the system to establish its position and the applicable speed restriction. The speed of the vehicle is then automatically adjusted using this information. A intriguing concept that has the potential to significantly improve traffic safety is the zone-based speed controller employing GPS. This device could eventually become a regular feature in cars with more research and development, making transportation safer and less prone to accidents.

References

[1]. Telaprolu, m.k, sarma, V.V.; ratankanth, E.K.; Rao, S.N.; Banda, v., vehicular Electronics and safety (ICVES), IEEE international conference pune (2009)
[2]. Gangadhar, S.; R N shetty Inst. Of Techno, intelligent road traffic Control system, IEEE conference Publication, kahargpur (2010)
[3]. Kassem, N. Microsoft Corp., Redmond, WA, USA Kosba, A.E.; Yousuf, M.; VRF-Based Vehicle Detection and Speed Estimation Vehicular Technology Conference (VTC Spring), IEEE(2012)
[4]. Ankita Mishra, Jyoti Solanki, Harshala Bakshi, Priyanka Saxena, Pranav Paranjpe: DesignofRF based speed control system for Vehicles International Journal of Advanced Research in Computer and Communication Engineering Vol. 1, Issue 8, October 2012
[5]. Sunil Kewate, S.V. Karmare, Nehal Sayankar, Siddharth Gavhale, "Automatic Speed Control System by the Color Sensor for Automobiles", International Journal of Advanced Mechanical Engineering. Volume 4, Number 2 (2014), pp. 223-230, ISSN 2250-3234
[6]. Sunitha R., Chander, Anitha R., Prabha, "Automatic Vehicle Accident Detection and Messaging System using GSM and GPS modem", International Journal of Advanced Researchin Electrical, Electronics and Instrumentation Engineering, Vol. 3 |July 2014
[7]. "Automatic Speed Control of vehicle in Restricted Areas using RF and GSM", InternationalResearch Journal of Engineering and Technology (IRJET), Volume: 02 Issue: 09| December 2015