Smart Navigation Tool for Vehicles

Manjunath.KM[1], Dinesh.K[2], Ganne Manoj Kumar[3], Harish R[4]

Assistant Professor [1], *UG Students* [2, 3, 4]

Department of E&CE, Rao Bahadur Y Mahabaleshwarappa Engineering College, Ballari, Karnataka, India

Abstract: **Smart navigation tool is a better alternative that one can develop a system which will automatically sense such traffic signs automatically and accordingly inform the drives and also assist him in controlling the vehicle voluntarily or forcibly. All in all resulting in a very effective and fail proof system to provide traffic regulation, safety and convenience of the people. The data is transmitted through an RF. The basic purpose of this system is to provide a means to control vehicle and guide the vehicle by sending alert messages to the vehicle continuously when vehicle enters school zones or hospital zone. Nowadays, it is hard enough to identify traffic zones where they are and what speed to maintain. This become easy by smart navigation tool and it continuously monitor surrounding environment by RF sensors and it guide, control the vehicle as per the limits of the zone. For anticollision, we make use of IR sensors to indicate the obstacle and stop the vehicle based on distance of the obstacle.**

Keywords- **Anticollision, RF sensor, IR sensor.**

I. INTRODUCTION

The project presented here is a novel approach towards vehicle navigation & safety implementation. As the title suggests, the project is aimed at automatically sensing the areas / zones like "School Zone", "Hospital zone" or "Accident Zone".

Even though these are meant for the safety of the vehicles travelling and also for the general public, it is hardly practices by the vehicle drivers. As a result, making the whole concept of displaying warning sign and messages on the roadside boards is meaningless.

To provide a better alternative, one can develop a system which will automatically sense such traffic signs automatically and accordingly inform the drives and also assist him in controlling the vehicle voluntarily or forcibly. All in all resulting in a very effective and fail proof system to provide traffic regulation, safety and convenience of the people.

As the whole project not just limited for these few functions, this project can be made mandatory. That way one can provide a more reliable security device and streamline traffic flow. Few additional features which can be integrated with this system are, "Auto-Breaking with Obstacle detection" "auto Speed limit Sensor" etc.

II. LITERATURE SURVEY

Recent studies show that one third of the number of fatal or serious accidents are associated with excessive or in appropriate speed, as well as changes in the roadway (like the presence of road-work or unexpected obstacles). Reduction in the number of accidents and mitigation of their consequences are a big concern for traffic authorities, the automotive industry and transport research groups. One important line of action consists in the use of advanced driver assistance systems, which are acoustic, hectic or visual signals produced by the vehicle itself to communicate to the driver the possibility of a collision. These systems are somewhat available in commercial vehicles today, and future trends indicate that higher safety will be achieved by automatic driving controls.

Road transport is important mode of transport in India. India has large network of road throughout the country. India faces the highest number of accidents and accidental fatalities in the world. Ministry of Road Transport & Highways report reveals that India witnesses one road accident every minute in a year which claims one life in 3 minutes. Contrary to the popular belief, only 1.5% of the accidents are caused by defective roads. In majority of the cases (77%), driver is at fault. This becomes more dangerous in populated regions like schools or hospitals. In school areas speed breakers are provided to reduce the speed of vehicles, but the drivers do this manually. Many times due to driver's fault speed is not controlled. This process can be automated by means of RF communication i.e. speed is controlled automatically.
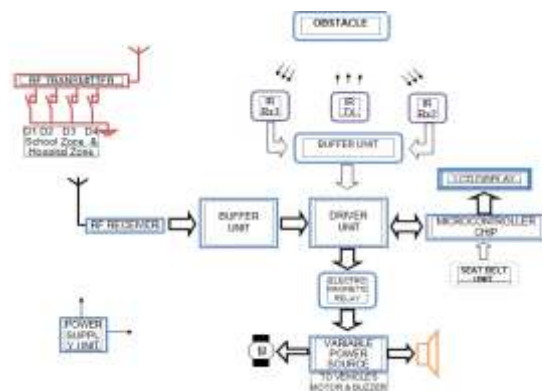
III. COMPONENTS USED

Figure 1: Block Diagram

A. Microcontroller Chip: This is heart of this system. This takes Zone Code signal as input and generates TWO command signals for output purpose. The inherited software manipulates the inputted data and generates two command signals. Depends upon the Zone Code, it generates set of two command signals. If Zone Code is from Curve Zone Transmitter then the display message is generated and Speed Limit Command is outputted.

B. Lcd Display: The Liquid Crystal Display shows the display messages generated by the Microcontroller chip, which is depending upon the Zone Code received.

C. Variable Power Source: When Speed Limit Command is generated after certain delay by the Microcontroller chip, it is sent to this stage for reducing the speed. This stage actually lowers the supply voltage to the vehicle's motor.

D. Power Supply Unit: As this stage has driver & relay stages, requires dual regulated power supply for working purpose. Specially designed +12 & +5 Volts regulated power supply is used to give proper working voltage to the whole section.

E. Buffer, Driver & Switching Module:

When the user programs the schedule for the automation using GUI [Graphical User Interface] software, it actually sends 5-bit control signals to the circuit. The present circuit provides interfacing with the Microcontroller and the controlling circuitry. This circuit takes the 5-bit control signal, isolates the MICROCONTROLLER from this circuitry, boosts control signals for required level and finally fed to the driver section to actuate relay. These five relays in turn sends RC5 coded commands with respect to their relay position.

First the components used in this Module are discussed and then the actual circuit is described in detail.

IV. WORKING PRINCIPLE

The working principle of our project has software module inherited in its memory and which scans continuously its input port pins for HIGH signal. When RF Receiver sends any HIGH signal that is fed to Buffer & Driver and energizes one relay. This relay's N/O [Normally Open] pins come into action and in turn supplies exact +5 Volts to input port pin of chip. This is necessary because chip accepts TTL compatible signals [i.e., LOW = 0 V and HIGH = exact +5 V] at its input port. After receiving any HIGH signal at its input port, software module identifies the zone by HIGH input pin number and accordingly generates alert message and control signal to output port. The alert message is sent to output port where LCD Module is connected for display purpose. The control signal is fed to Buffer& Driver and Switching Stage for execution of control signal.

V. IMPLEMENTATION

The project ables to detect the school zones, hospital zones, any obstacles and also detects the wearing of seat belt, and according to the input obtained to the microcontroller from these sensors actions are performed. When vehicle enters the school zone vehicle's speed will decrease as the signal received by the RF sensors and similarly the horn sound will be decreased or cancelled when vehicle enters the hospital zone. Also this smart tool helps in detecting the obstacle with the help of IR sensors and reduces the speed of vehicle or stops the vehicle based on the distance of the obstacle.
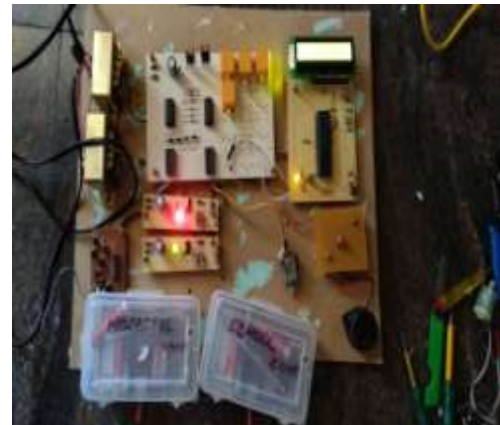

Figure 3: Working Model of our Project

VI. APPLICATIONS

- The project is used to secure and avoid the road accidents.
- It can be used as part for automation of s or Public Transportation.
- This system is used to trace the culprit vehicles by police persons.
- This project can also be used by Cargo Companies to intimate their on-road vehicles about the next delivery spot or assignment.
- This system can be used to 'time keeping' purpose in public transportation, such as departure & arrival timings, number of rotations each vehicle turned etc.

VII. ADVANTAGES

- This application is very useful on any kind of vehicle.
- This application is easy to install and easy to operate.
- Manpower can be saved by implementing auto detecting circuits.
- More reliable than manual Operation.

VIII. DISADVANTAGES

- If any problem arises in RF anteena it causes in damage of whole system.
- RF sign zone with same frequency boards can effect the system

IX. CONCLUSION

In this system it shows that the automatic reduction of vehicles speed, if the vehicles speed is not being reduced in the safe zones. Here, as we are towards the safe zones our vehicles speed will be automatically checked with the speed that is being stored in the RF tag that is being placed near the safe zones and if the vehicles speed is greater than the speed that is set in the tag then the driver will be indicated to reduce the speed with the help of the buzzer being produced. Even after the indication of the buzzer, if the driver is found that he is not reducing the speed then the information about the vehicle will be sent to the particular authority with the help of the GSM. After sending the information to the authorities the vehicle as it is nearing to the safe zone, the vehicles speed will be automatically be reduced with the help of Arduino and gradually the vehicle will be stopped. In our project as the vehicle will be stopped automatically when it exceeds the speed limit or when the driver is in a drowsy state. Due to this the vehicle will be stopped immediately and the upcoming vehicles will not know about it and hence a collision may occur. So in our future we will indicate the upcoming vehicles about the stopping of our vehicle.

REFERENCES

[1]. Jyothi Kameswari, Satwik , "A Design Model for Automatic Vehicle Speed Controller," International Journal of Computer Applications, Vol.35, No.9, 2011

[2]. Vinod Rao, Saketh Kuma, "Smart Zone Based Vehicle Speed Control Using RF and Obstacle Detection and Accident Prevention," International Journal of Emerging Technology and Advanced Engineering, Vol.4, No.3, 2014

[3]. https://www.engineersgarage.com/contribution/Basic-Model-of-RF-Transmitter-Receiver/ this link contains working of RF Transmitter and Receiver

[4]. G.V. Sairam, B. Suresh, CH. Sai Hemanth, K. Krishna sai "Intelligent mechatronic braking system" International Journal of Emerging Technology and Advanced Engineering Volume 3, Issue 4, April 2013.

[5]. Milind S. Deotale, Hrishikesh Shivankar, Rohit More "Review on Intelligent Braking System", International Journal on Recent and Innovation Trends in Computing and communication, Volume 4, Issue 4.