

Smart Technology for Vehicle Safety

Shraddha Biradar¹, Pooja Dhakne², Devaki Vale³, Seema Deoghare⁴

^{1,2,3}Students, Dept. of Electronics and Telecommunication Engineering, Pimpri Chinchwad College of Engineering, Pune, Maharashtra, India

⁴Assistant Professor, Dept. of Electronics and Telecommunication Engineering, Pimpri Chinchwad College of Engineering, Pune, Maharashtra, India

Abstract - Now-a-days number of accidents have increased in hilly and ghat regions due to narrow roads, sharp turns. Accidents may occur due to over speeding, overtaking, climatic conditions like foggy atmosphere, landslides etc and careless driving of a driver. In our idea we have focused on parameters like speed detection, foggy nature and landslide. Mainly we are focusing on units like roadside and vehicle where roadside is monitoring the environmental parameters mentioned above like fog and landslide while vehicle unit will detect speed and obstacle and send data to road side unit. Here communication is between roadside and vehicle which is nothing but V2R. Communication is wireless, here range is not problem as roads are narrow enough and we are not using concept of line of sight.

Key Words: Wireless Communication, V2R.

1. INTRODUCTION

Vehicular networks, a major component of the intelligent transport systems (ITS), aim to contribute towards safer and efficient road traffic. The primary objectives of such networks are to provide road safety and to save invaluable lives. Vehicular networks are expected to reduce car crashes by providing various road safety applications such as assisted driver systems and lane changing warnings. In addition, avoiding traffic congestion, provision of effective traffic management and infotainment applications are other key areas of concern for vehicular networks. In vehicular networks, generally, two different modes of communication exist: vehicle-to-vehicle (V2V) and vehicle-to- roadside (V2R). ITS enables elements within the transport system such as commuters, vehicles, roads, traffic lights, message signs to become intelligent, embedding them with microchips and sensors, empowering them to communicate with each other. Wireless data communication between vehicles is one the technologies which has improved the deployment of the ITS applications. This communication is divided generally into: Vehicle to Roadside (V2R): Vehicles communicates directly with

neighbor infrastructure. Vehicle-to-Roadside communication (V2R communication) is the wireless transmission of data between motor vehicles. The goal of V2R communication is to prevent accidents by allowing vehicles in transit to send position, speed data and panic information to one another over Wireless network. Depending upon how the technology is implemented, the vehicle's driver may simply receive a warning should there be a risk of an accident or the vehicle itself may take pre-emptive actions such as braking to slow down.

1.1 Objective

- To study V2R (vehicle to roadside) communication and hazardous conditions responsible for road accidents.
- To design a system to avoid the risk of car accidents such as cooperative collision warning, pre-crash sensing, lane change, traffic violation warning.

1.2 Problem Statement

To design a smart system for vehicle safety with the help of RF to avoid road accidents in hilly regions ,foggy atmosphere and extreme climatic conditions by providing information of that area to vehicle before entering that area using V2R communication technology

2. LITERATURE SURVEY

Intelligent traffic signal control system for V2V/V2I communication using vehicular ad hoc network:

In this paper, they propose to use vehicular ad hoc networks (VANETs) to collect and aggregate real-time speed and position information on individual vehicles to optimize signal control at traffic intersections. They first formulate the vehicular traffic signal control problem as a job scheduling problem on processors, with jobs corresponding to platoons of vehicles. We are

using V2I communication in our system with the help of this research paper. Vehicle-to-Infrastructure communication (V2I communication) is the wireless transmission of data between motor vehicles. It is also used as the wireless exchange of critical safety and operational data between vehicles and highway infrastructure.

Toward V2I communication technology based solution for reducing road traffic congestion in smart cities:

The goal in this paper is to reduce traffic congestion while avoiding, whenever and wherever possible, stoppings. This is possible through an improved coordinated and controlled acceleration/deceleration of vehicles and an increased awareness of their surroundings. The main goal of our system is that we are trying to reduce road accidents in hilly regions. So that we are using sensors like fog sensors, landslide sensors, etc. so with the help of these sensors we can reduce the road accidents. Thus ,it can be achieved with the help of vehicle-to-infrastructure (V2I) communication.

3. PROPOSED METHOD

3.1 Flow Chart

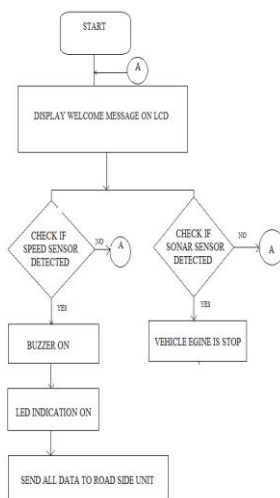


Fig.1: Algorithm for Vehicle Unit

1. Start
2. Initialize the LCD and display welcome message on the LCD.
3. Check the status of both the sensors i.e. speed sensor and sonar sensor.
4. If the vehicle goes beyond particular speed then

speed sensor is detected. If not then LCD displays the message welcome only.

5. After detection all data is send to the roadside unit.

6. Then buzzer will be on.

7. And LCD will display the message that reduce the speed of vehicle.

8. If sonar sensor is detected then engine of vehicle will stop. If not detected then LCD will display the message welcome only.

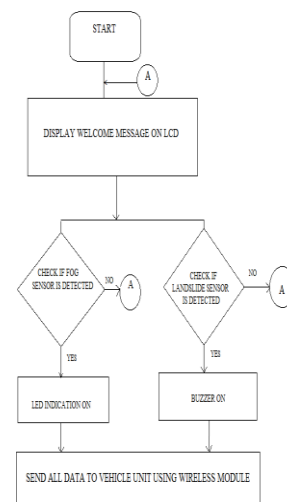


Fig.2: Algorithm for Roadside Unit

1. Start
- 2.. Initialize the LCD and display welcome message on the LCD
3. Check the status of both the sensor i.e. fog sensor and landslide sensor
4. If there is foggy atmosphere after some distance then fog sensor is detected by displaying the message that there is a foggy atmosphere
5. If it is not detected then LCD displays the message welcome only
6. If there is landslide after some distance then landslide sensor is detected by displaying message there is landslide.

4. CONCLUSION

The system smart technology for vehicle safety is the wireless exchange of critical safety and operational data between vehicles and roadway infrastructure, intended primarily to avoid motor vehicle crashes. We know that the life of people is very much important so that main purpose of our system is to reduce road accidents in hilly region to save the people from accident.

REFERENCES

1. B. K. Konstantinos Domdouzis and C. Anuba., "An experimental study of the effects of different medium on the performance of RFID system," vol. 21. Advanced Engineering Informatics, 2011.
2. K. Finkenzer, Fundamentals and Applications in Contactless Smart Cards and Identification. John Wiley and Sons Ltd, 2003.
3. M. Mazidi, 8051 Microcontroller and Embedded Systems. Pear-son Education India, 2007.
4. K. M. R. Sudeep Dogra, "Radio frequency identification (RFID) applications: A brief introduction, advanced engineering informatics." The IUP journal of Electrical and Electronics Engineering, 2011, p.