IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, February 2024

Vehicle to Vehicle Communication for Crash Avoidance System

Prof. Pathak. J. G[1], Kadlag Payal Santosh[2], Gaikwad Dipali Kiran[3], Satpute Harshad Sopan[4], Landge Vaishnavi Bhausaheb[5]
Lecturer, Department of Electronic and Telecommunication[1]
Students, Department of Electronic and Telecommunication[2,3,4,5]
Amrutvahini Polytechnic, Sangamner, Maharashtra, India
jayesh2756@gmail.com, payalkadlag826@gmail.com, dipaligaikwadpatil7@gmail.com
harshusatpute2@gmail.com, landgevaishnavi2004@gmaill.com

Abstract: *The Dramatic increase in the traffic flow raises demand on innovative technologies that can improve safety and efficiency of transportation systems. Road safety can be substantially enhanced by the deployment of wireless communication technologies for vehicular networks, which enable new services such as collision detection traffic management, and further communication facilities between moving vehicles. Aiming at providing reliable wireless communications for vehicular networks the RF communication will serve as an underlying protocol for future inter-vehicular applications worldwide. This paper presents an implementation of a complete vehicle to vehicle communication, designed according to the specification. In addition to this a blind spot detection system for protection against misshapen like vehicle collisions that causes loss of human lives is being implemented. The blind spot detection system will be useful while changing the lane. Ultrasonic sensors, Raspberry pi, RF module and GPS modules are used to implement the complete design The main aim of V2V communication is to prevent accidents by allowing vehicles in transit to send position and speed data to one another. The vehicle's driver may simply receive a warning should there be a risk of an accident or the vehicle itself may take preemptive actions as braking to slow down.*

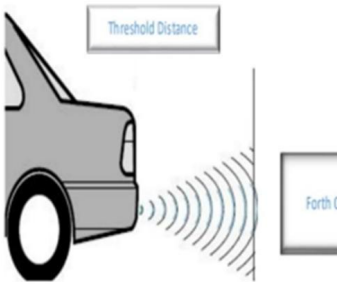
Keywords: For V2V Communication, Crash Avoidance System, Intelligent, Transportation System (ITS), Vehicle Safety, Collision Warnig, Cooperarive Adaptive Cruise Control (CACC), Wireless Commnication, Dedicated Short-Range, Communication (DSRC), Vehicle-to-Everything (V2X), Sensor Fusion, Connected Vehicles, Traffic Safety, Real-time Data Exchange, Automated Emergency Braking (AEB), Machine Learning for Collision Prediction

I. INTRODUCTION

The main objective of the project is to alert the drive when he closes to the front vehicle. The idea is that, if collision, avoidance systems can work between vehicles, then every car on the road will be safer by avoiding accidents before they can ever happen. The importance of autonomous or semi- autonomous vehicles for intelligent transport system (ITS) is increasing. This work aims to investigate the existing technologies used for the system to predict and prevent motor vehicle collisions. Airbags and air brakes are installed in most luxury cars to ensure the safety of passengers during the crash. The vision-based traffic alert system to assist the driver is also being considered in the early days, and the main intention was to warn the driver that he is predicting the possibility of a damaging traffic situation.

DOI: 10.48175/IJARSCT-15450

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, February 2024



II. LITERATURE SURVEY

Development of Autonomous Emergency Braking control system based on road friction

In general, the AEB system employs a Time- To-Collision to measure the potential danger of impact into obstacles. Time-To-Collision is the smaller threshold to activate the braking system.

Control system design for an Automatic Emergency Braking system in a sedan vehicle Control system design for an Automatic Emergency Braking system in a sedan vehicle.

Garcia-Bedoya discussed the Automatic Emergency Braking (AEB) system in vehicles is one of the technologies suggested by NHTSA to be included in vehicles by default. This article presents the dynamic model of the suggested by NHTSA to be included in vehicles by default.

III. NEED OF PROJECT

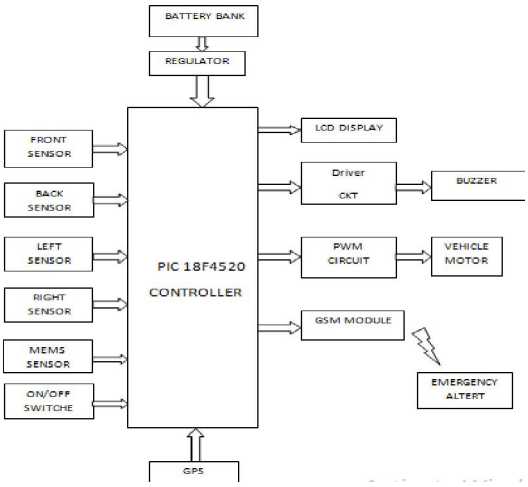
Every year, approximately 1.35 million people die as a result of road accidents. Because of these accidents, more than 20 to 50 million people suffer from non-fatal injuries. And many become disabled from these injuries. Road crashes cost USD $518 billion globally, costing individual countries from 1- 2% of their annual GDP [1]. The challenge is to reduce the number of accidents. For which, it's better text heads-the template will do that for to take action before an accident occurs. But sometimes it's not in our hands. And so, many injured lose their lives for not getting informed beforehand. An automated intelligent system would be the best solution considering the circumstances. There exists no system that controls vehicle speed to prevent accidents whit automatic alert.

IV. AIM & OBJECTIVES OF PROJECT

- The major objective of this is to the development of the accident avoidance system for automobiles.
- To build an excessive speed Control system to prevent accident
- Reduce road accidents
- Provides Wireless Vehicle Battery Charging
- System Development

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, February 2024

V. SYSTEM DEVELOPMENT



VI. WORKING

In this system the ultrasonic sensor is mounted on the front, backside, left and right of the car for measuring the distance between the two cars and if the distance is less then to avoid accident warning signal will be given to the driver on the LCD.. The speed sensor will monitor the speed of the car and if found high then warning will be given to the driver using an alram. Master is responsible for each and every action performed in the system. Master has the higher priority over slave. Master tells slave what has to be done, and take action over slave performance. Slave takes all commands from master and monitors the sensor value continuously. Finally master monitors all the operation of the system.

VII. APPLICATION

Vehicle safety

In most of the industrialized countries, the highest priority is vehicle safety. The reason is the increasing number of traffic accidents due to the growing number of vehicles.

Comfort for the driver and passengers

The comfort of the driver can be increased by turning on the cooling system when the interior car temperature exceeds the threshold value

Advantages

Improves traffic management

The traffic light schedule may vary depending on the traffic congestion. Law enforcement officials can use this technology to provide drivers with real-time instructions.

Assistance to the driver

Vehicular communications can help with parking by providing information about the other vehicles nearby.

Avoid collisions

The driver is notified in time of a possible car accident.

VIII. CONCLUSION

In this system the ultrasonic sensor is mounted on the front, backside, left and right of the car for measuring the distance between the two cars and if the distance is less then to avoid accident warning signal will be given to the driver on the LCD.. The speed sensor will monitor the speed of the car and if found high then warning will be given to the driver using an alarm. Master is responsible for each and every action performed in the system. Master has the higher

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, February 2024

priority over slave. Master tells slave what has to be done, and take action over slave performance. Slave takes all commands from master and monitors the sensor value continuously. Finally master monitors all the operation of the system. The overall action will be continuously displayed on the display system. Ultrasonic sensor is customized to live a spot with relevance the previous car. For this subsystem, the currently available ultrasonic sensors are adopted to make sure that the distance is maintained well and based on the readout of the sensor appropriate warning signals are provided. If accident occurs then MEMS sensor detects accident and immediately sends SMS to the concerned person about location of accident.

REFERENCES

[1]. Kanarachos, Stratis (2009). "A new method for computing optimal obstacle avoidance steering manoeuvres of vehicles". International Journal of Vehicle Autonomous Systems 7 (1): 73–95. doi:10.1504/IJVAS.2009.027968. Retrieved 29 July 2015.

[2]. P. S. Kedareswar and V. Krishnamoorthy, "A CAN protocol based embedded system to avoid rear- end collision of vehicles," 2015IEEE International Conference on Signal Processing, Informatics, Communication and Energy Systems (SPICES), Kozhikode, 2015, pp. 1-5.

[3]. M. Hashimoto, T. Konda, Bai. Zhitao and K. Takahashi, "Laser-based tracking of randomly moving people in crowded environments," IEEE Int. Conf. Automation and Logistics, 2010.

[4]. T. Kasuga and S. Yakubo, "Design of a dependable model vehicle for rearend collision avoidance and its evaluation," in Instrumentation and Measurement Technology Conference (I2MTC), 2010 IEEE, 2010, pp. 641-646.

[5]. Liang Li, "A Rear-end Collision Avoidance System of Connected Vehicles"2014 IEEE 17th International Conference on Intelligent Transportation Systems (ITSC) October 8-11, 2014. Qingdao, China