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Smart Highway Systems for Accident Prevention Using IOT

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Abstract: ***The number of accidents in India arehighest in the world. The actual number of accident number may be higher than documented. One person dies in every 4 min. In India nowadays safety on roads has become a serious issue as well as all over in the world. At some places accidents occur like crossings, diversions on highways. The accidents on highways can be prevented by understanding the psychological state of driver.A smart system for accident prevention is an ideal concept for smart roads. It is a project with innovative ideas for safety on roads and highways.An Internet of Things (IOT) with sensors is used to transmit the entire data collected by sensors to take actions under emergency conditions and to communicate through wireless protocol. In this paper we are presenting an electronic system which is based on embedded and Internet of Things (IoT).***

I. INTRODUCTION

The presence of devices in an automobile that connect the device to other device within the vehicle or devices networks and services outside the car including other car, home, office or infrastructure.Connected vehicles safety applications are designed to increase situation awareness for accidents though vehicle to vehicle (V2V) and Vehicle to Infrastructure (V2I) communications. The vehicle to vehicle and vehicle to infrastructure communication is done by using two Raspberry-pi.In this project advanced controller is used that is raspberry pi. It also implements wireless vehicle to vehicle communication. Here one vehicle transmits message to another vehicle wirelessly and it reduces noise pollution also because horn is not needed for indication. Ultrasonic sensor measures distance between two vehicles. Here we are also using alcohol detection sensor. When alcohol is detected in vehicles the supply will be off automatically by using relay. In this Project all this communication is done with IOT(Internet of things). we are also using GPS tracker which calculates the langitude and lattitude of vehicles and we will get exact position vehicle.Road traffic safety application have stringent requirements for both bounded delay and high reliability. Examples of road traffic safety applications are warning emergency vehicle approaching , stationary vehicles, drowsiness detection , alchohol detection, anti breaking system.

II. METHODOLOGY

This project has idea of prevention of acccidents and detection. The detection is done by using sensors. Raspberry-pi is used for wireless V2V communication to exchange safety messages and display messages on server. Ultrasonic sensor is used for distance mesurment between vehicles. An another sensor is used for alcohol detection. If there is alcohol in vehicles the supply will be off automatically by using relay. The GPS tracker calculates the langitude and lattitude of vehicles and we get exact position vehicle. Here we have also done with vehicle to Infrastructure communication. An external power supply is provided for operating. If a vehicle arrives near to another vehicle the ultrasonic sensor calculates distance between them if the distance is less than required distance then a safety message is send to LCD display through server on another vehicles LCD this will prevent vehicle from accident. . Here one vehicle transmits message to another vehicle wirelessly and it reduces noise pollution.

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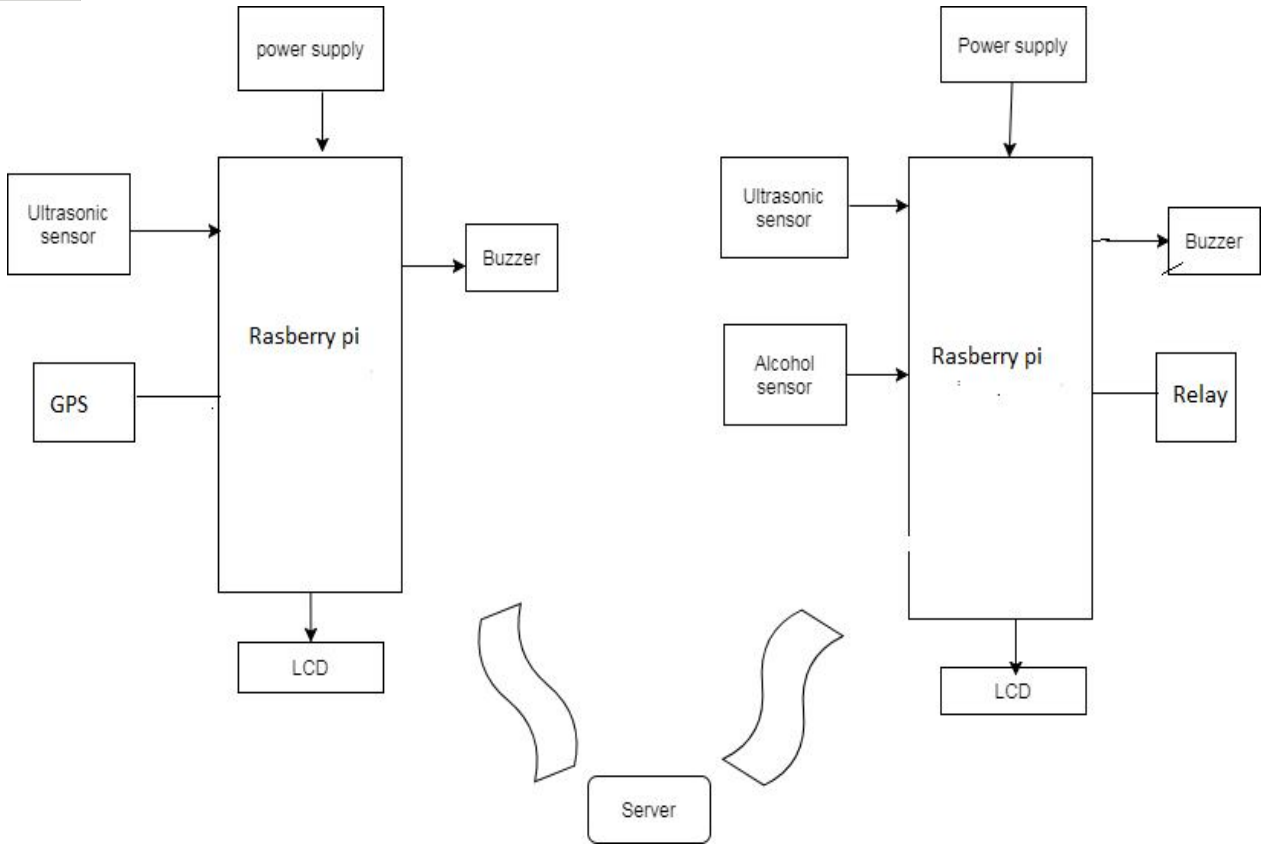
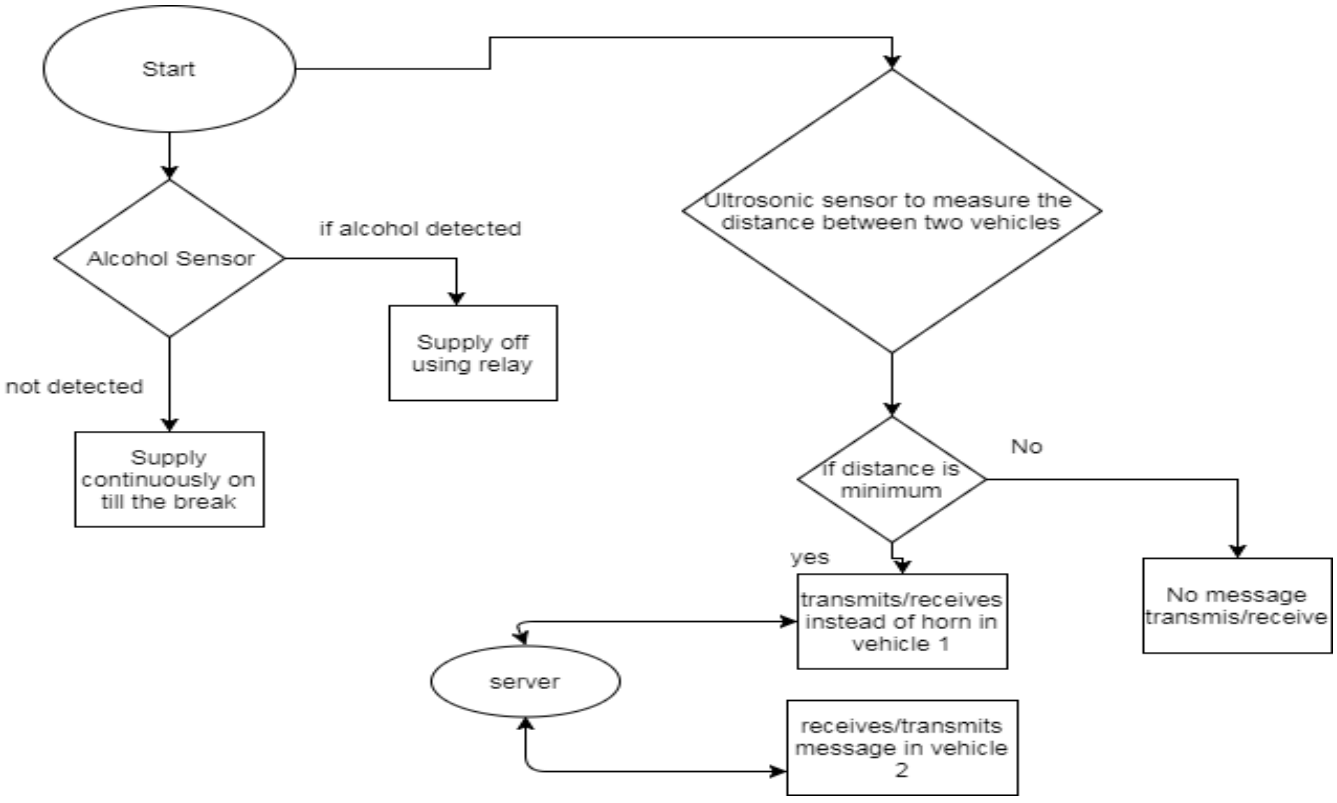


Fig.1.Block Diagram Smart Highway Systems For Accident Prevention Using Iot

A. Flowchart



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B. Proposed Work

The main objectives of this project are we have to analyze different methods to avoid accidents on road, Design, simulate and analyze the new technologies on wireless connectivity for safety on highways. Also we have to do communication with internal and external environments supporting the interactions betweenvehicle and sensor, vehicle and vehicle, vehicle and Infrastructure .

C. Advantages

1) *Reduces loss of life & property:*It is very difficult and also dangerous to communicate through mobile phones while driving. With this project it will be easy and safe to communicate from one vehicle to another without accessing any cellular device hence this will reduce loss of life & property.
2) *Get road condition prior :* It is impossible to know how the road conditions of the route will turn out on which we are travelling so we can get updates of road conditions prior to the journey.
3) *Easy to Communicate:* Due to use of Raspberry-pi as communication device we can communicate easily for V2V and V2I commmunication.
4) *Efficient and Saves Time,Money:*The parameters to be sensed across this network infrastructure, provides new technological opportunities for more accuracy and efficiency of the real world into computer-based systems, this will reduce human intervention and saves time and money this will give better life.

D. Disadvatages

The existing sensor based systems are able to detect only those vehicles that are within the employed sensors measurement ranges
When there is bad weather condition, the detection becomes impossible or the accuracy drops significantly
Technology Takes Control of Life, Also there is possibilty of compatabilty and complexity of IoT

E. Applications

This system is used for V2V Communication as well as for V2I communication, to exchange messages wirelessly and display safety messages on sever or LCD, by using sensors distance is measured between vehicles and for automatic braking system.

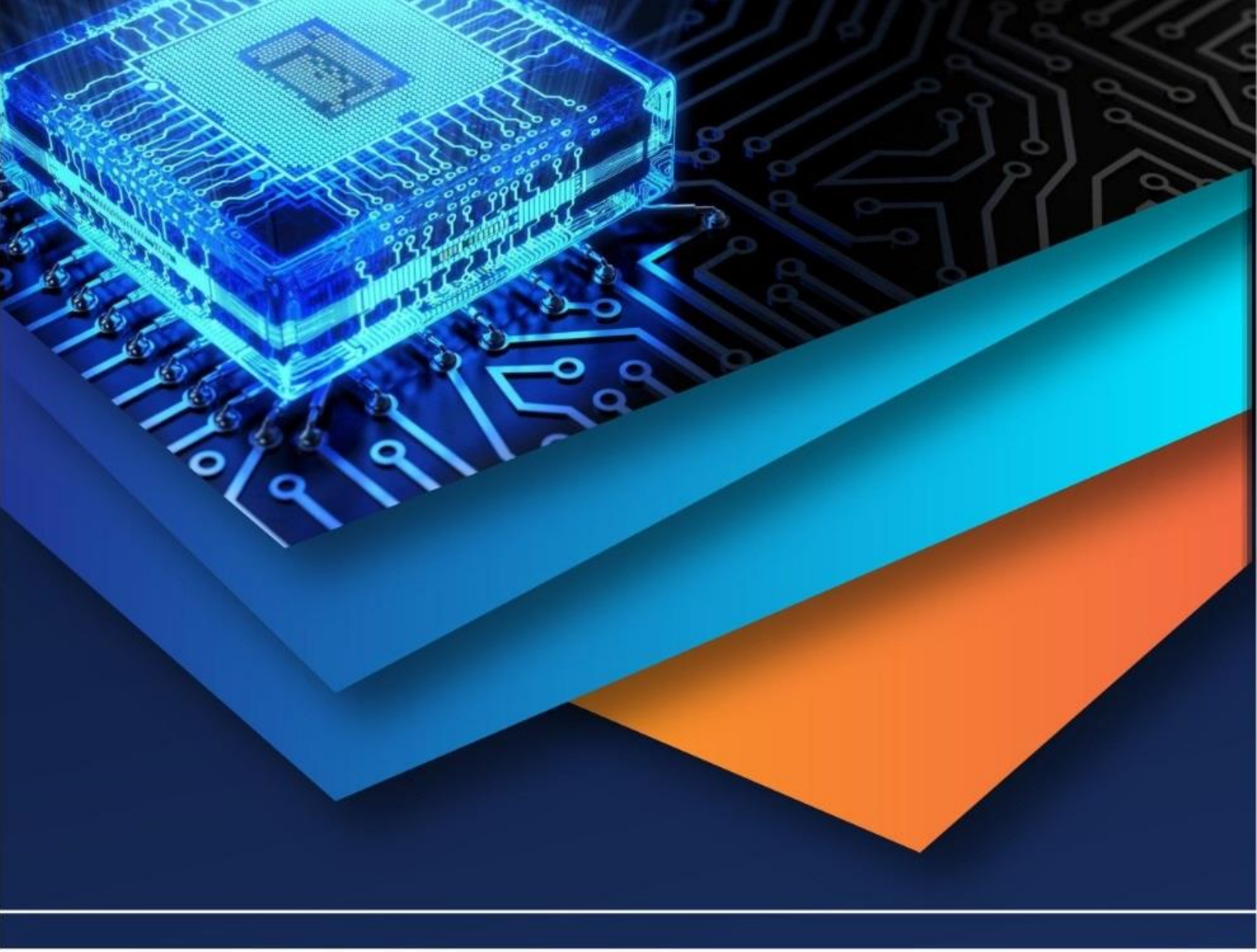
III. CONCLUSION

In this project smart system has been implemented for the highway system which uses concept of IOT. This project includes use of various sensors like ultrasonic sensor that detects various type of accidents, to avoid it, a novel idea is proposed for monitoring the accident over the highways. Using wireless communication message will be sent to another vehicle, Infrastructure (Home, hospital, police station or quick response team) and also displayed on server display. Thus here by we conclude that the proposed system remove all the drawbacks of existing system and enhanced with the IoT system for V2V and V2I system. So it makes the highway system very smart thus we named it as “Smart highway system for accident prevention using IoT”

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