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# Multi Object Detection in Vehicle for Accident Prevention and Safety Assistance using Embedded System - Implementation Paper

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***Abstract*— The aim of this project is to develop a road safety options in cars to avoid collision with a vehicle or AN obstacle on the method. Timely detection of alternative objects within the neck of the woods is of utmost importance to stop accidents and potential loss of human life, traffic jams particularly in craggy areas with hair pins bends and reduced visibility condition in dense foggy areas. The Embedded system within the automotive would be capable of detective work varied objects round the automotive which can facilitate the motive force to drive safely in poor weather. system carries with it completely different good sensors akin to frequency, unbearable sensors which can determine the nearer objects .The show system with within the automotive can show the near automotive inside region of frequency whenever any obstacle can enter to nominative car safe zone then device can alert the motive force to require action over it. If the obstacle is within the front then the microcontroller can communicate inside system and alert driver if any factor enters to safe zone and conjointly fog affects visibility, the sensors would acknowledge another automotive and alert the motive force of any dangers that lie ahead, giving the motive force enough time to weigh down, permitting him to flee from what may are a nasty accident.**

***Index Terms*— Radio Frequency (RF), Ultrasonic Sensors, show device .Internet Of Things (IoT).***

## I. INTRODUCTION

Vehicles are associate important method of transportation everywhere the globe. There are several cases of road accidents a day within the world. Such mischances build automobile overloads on street from hours to days, thus taking place loss of prof-table time. Frequency of street mischances is high that causes a good deal of hurt to human life and vital a part of properties. The number of mishaps is high in sloping and fog influenced territories. Typically various street mischances are caused by impact between vehicles due to the failure of the drivers to live the sting of their vehicles and different reason is mental object of close-by vehicles. The high rate of on street mischances because of impact impels our worry on crash shirking framework for the most part for sloping and thick fog influenced regions. Continuous following of moving objects is profoundly popular and vital to numerous applications, for example, vehicle following, front line observation, creature natural surroundings checking, and quiet following in clinics. GPS is an innovation surely understood for its precision. In any case, GPS just works in open air conditions without satellite signs being blocked. This innovation is typically expensive, including foundation, organization, and upkeep, and may have a few limitations put on the situations in which it is connected. Radio frequency (RF) is another promising innovation, which uses stage distinction idea to track moving objects if both moving objects and some reference objects are utilizing RF signs to convey. In principle, the got flag is an element of the separation between the transmitter and the collector as demonstrated in numerous spread models.

## II. RELATED WORK

We first summarize the work of Existing System in collaboration with technology

A. Collision Detection System for Vehicles in cragged and Dense Fog Affected space to get Collision Alerts PCB, it will transmit a signal and when object will detect on road the the receiver will receive the signal and signal will be send to PCB there is a display screen connected to it and it will notify the user, the range of ultrasonic sensor is 10 meter. the next is Ra-dio frequency which will generate a region in 360 which will detect object within 500 meter and notify on the display screen..

In this paper, author Anil Kumar Gupta mentioned that the Collision Detection System for Vehicles in cragged and Dense Fog Affected space to get Collision Alerts transport col-lision detection system is developed to avoid accidents, supported GPS technology. Our collision detection system

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captures the geographic location of vehicles and a watch within the sky server processes this knowledge and generates alert for collision warning.

1. Vehicle transmits current details to server :

A GPS device mounted on vehicle captures the geographic lo-cation points (latitude & longitude), AZ from true north and speed of auto. of these details area unit clubbed along and transmitted to the server.

2. Eye within the sky server :

Server receives knowledge from all the devices and maintains a data-base for chase. This server processes received knowledge from ve-hicle associated returns an inventory of all near vehicles and generates an alert if any vehicle is moving/entering into shut proximity of this vehicle.

3. Collision Detection :

Server is accountable for process the vehicle location data-base and generating alerts for vehicles if they're in shut prox- imity. Server keeps on chase the security regions of vehicles and generates alerts for all vehicles with overlapping safety zones as before long because it finds any intersection in safety zones of in-dividual vehicles.

## III. PLANNED SYSTEM

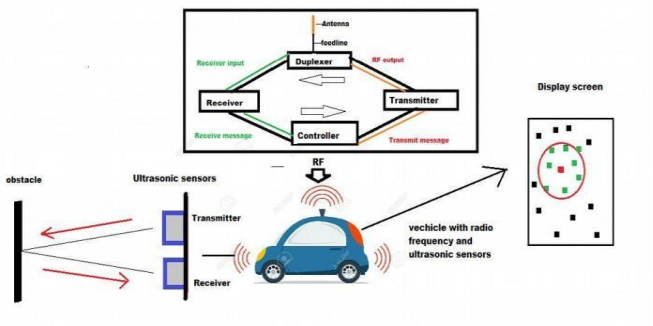


Fig 1. The construction of Future System.

In todays situation ,there are road acci-dent every day in the world. We will de-velop a independent system which includes radio frequency, display screen PCB and Ultrasonic sensor. is placed on front and back of the car which will be connected to

## SYSTEM MODULES

- Application
- Ultrasonic sensor
- PCB
- Radio Frequency

### *A. Application:*

User will login in throw application and get connected with integrated system the objects around the user's car will be shown on application if any vehicle or object comes under safe zone then instant alarm will be given to user so he can take proper action over it.

### *B. Ultrasonic sensor*

Ultrasonic sensing element is employed for anti-collision system. it'll sense the space of near vehicle and different objects, if this distance decreases on the far side specific limit it, can inform the con-troller and controller can take fast action and can warn by ringing buzzer and manual action are going to be taken by driver at intervals specific time.

### *C. PCB*

We are developing our own customise computer circuit board (PCB) the most advantage is that the interconnection between the parts is formed through copper tracks rather than employing a range of current carrying wires. It makes the interconnections less large. the traditional technique of circuit connections takes a lot of time to attach the parts. Whereas the computer circuit board takes less time in aggregation a circuit as compared to traditional technique.

A computer circuit board offers less physics noise. If it's not ordered out properly, then the noise may considerably degrade the performance of the circuit. All the higher than factors bring dependableness within the performance of the circuit.

### *D. Radio Frequency:*

An RF module (radio frequency module) could be a little electronic device accustomed transmit and/or receive radio signals between 2 devices. In Associate in nursing embedded system it's typically Desir-able to speak with another device wireless. In our sys-tem we have a tendency to be victimisation 433 RF

Module. The RF module is use to speak with near vehicles. In our system we have a tendency to ar victimisation 433 MHz ra-frequency vary. RF transmitter receives serial knowledge Associate in Nursingd transmits to the receiver through an antenna that is connec-ted to the fourth pin of the transmitter. once logic zero applied to transmitter then there's no power provide in transmitter. once logic one is applied to transmitter then transmitter is o

## SCIENTIFIC PROTOTYPICAL AND EXAMINATION

$Q = \{A, B, C, D\}$ $\Sigma = \{Yes, No\}$
$q_0 = \{A\}$
$F = \{D\}$

| Transaction State | Input | |
|---|---|---|
| | Yes | No |
| A | B | D |
| B | C | D |
| C | A | D |
| D | - | - |

Fig.2 Transection

Table $Q = \{A, B, C, D\}$
$\Sigma = \{Yes, No\}$ $q_0 = \{A\}$
$F = \{D\}$

$\delta$ (A, Yes) = B $\delta$(A, No) = D $\delta$(B, Yes) = C $\delta$(B, No) = D
$\delta$(C, Yes) = A $\delta$(C, No) = D

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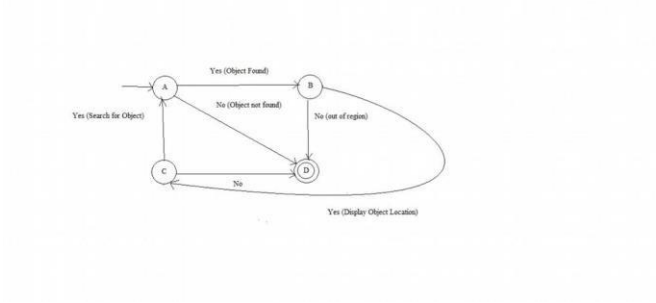



Fig.3 Mathematical Module

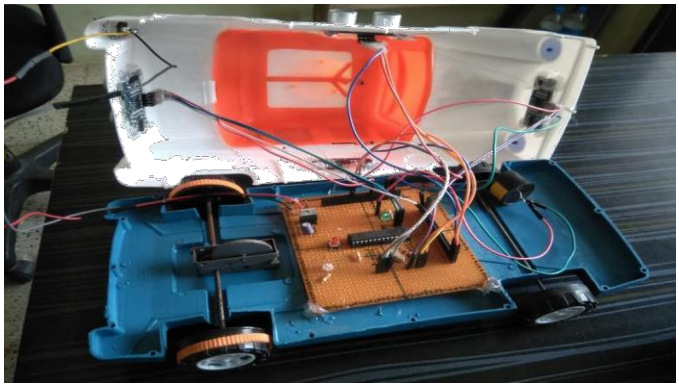
A = Searching
B = measured Distance between Object C = Send Alert
D = Stop alert / Final state

## VI. RESULTS

We have Implemented our system inside the car which consist of ultrasonic sensors and embedded PCB design for collision detection object with in 10meter by calculating distance and giving alert to the user.

We are using ATmega328is an eight bit Microcontroller. Its exceptional features are cost efficiency, low power dissipation,real timer counter . It is used in Embedded Systems applications.


This is how PCB Designed inside car which will detect object around the car through ultrasonic sensor and it will give alert by buzzer.



## CONCLUSION

Hence we conclude that there are various technologies that can be used to improve road safety, but they tend to be self-contained and do not inter-act much with other technologies. In Our system we allow these technologies to collaborate and share in- formation with each other it helps in detecting multiple object and prevent accident on the road.These system have been fully implemented and tested, and based on the positive and encouraging results obtained from running them,we envisage such collaboration to have beneficial impact towards improving road safety and efficiency.

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