



Moving Object Detection and Intersection Collision Avoidance for Real Time Environment

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Abstract:

In our country maximum death occur due to road accidents than any other factors. It is one of the major losses to India caused by a human error. This contributes to major family suffering and income for dependents and pain for life time or temporary or partial. Government and NGO's have taken many activities, awareness program, and distribution of pamphlets, posters, short movies and etc to come the accident rate and by using it as an awareness the vehicle accident is not Every year more than 1.5% increase in road accident and it is approximately more than 6 lakh road accidents in India, for every one minute one road accident and for every 4 minutes one death due to road accident. India is losing very huge youth as the maximum death age group are from 16 to 30 years European countries, American and Middle East countries have very less road accident by adopting multi approach road safety and traffic management. In many countries driving license will be issued only for 2 years and must get renewed driving license after attending training program with driving tests .Many improvements have taken and taking place in the design and quality of road construction. Many safe transport system, safe vehicles, law are in place. Present quick accident response as been done by using toll free numbers like 108 and Supreme Court as passed order all hospital must treat road accident victims immediately and police must not ask or torches the people who help accident victim to bring them for hospital .Road safety is involved by many agencies like Health, Police, Pollution Control Boards, Transport dept and NGO's. Road accidents study gives the information to make suitable changes that is required to save human life.

Key words: Road Safety, Accident Prevention, Pedestrian Safety.

1. INTRODUCTION

Many safe transport system, safe vehicles, law are in place. Present quick accident response as been done by using toll free numbers like 108 and Supreme Court as passed order all hospital must treat road accident victims immediately and police must not ask or torches the people who help accident victim to bring them for hospital .Road safety is involved by many agencies like Police. Pollution Control Boards, Transport dept and NGO's Road accidents study gives the information to make suitable changes that is required to save life. The main causes for road accidents is due to usage of mobile phones while driving, sending messages, handling of mobiles or not concentration while driving or alcoholic or lack of sleep etc., are some of the causes that may lead to human tragedy in road accidents. It involves very high cost which cannot be filled by money or any other, as cost may be permanent suffering for person injured loss of earning for the family members and even death. Government and NGO's have made many efforts and taken many programs and awareness. The main motive behind this paper is to reduce these reckless accidents for which we propose a system that controls the speed of the vehicle without any inconvenience to the driver. There are circumstances where the speed of the automobile is beyond the expected speed limit or the driver does not obey traffic signals. Therefore we are using RF technology.

2. PROPOSED SYSTEM

The proposed system detects the motion of vehicles in Roadways especially in intersection and it is used to avoid Collision Of vehicles by indicating the presence of vehicle

from other direction when seeing from a particular side and also by controlling the speed of the vehicle. PIR sensor is used to detect the motion of the vehicle. Ultrasonic sensor is used to find the distance of the vehicle from barricade. The output from the sensor is used to alert when the distance between the Vehicle and the barricade lower than the safety limit. These Values are given to the Arduino which controls & monitors the roadways. A rf transmitter is used to transmit the data from the Central controller to another controller which is present inside the vehicle. This secondary controller after receiving a control signal from the central controller will control the speed of the vehicle if it is greater than a particular limit otherwise normal speed is maintained.

3. BLOCK DIAGRAM

i) Transmitter

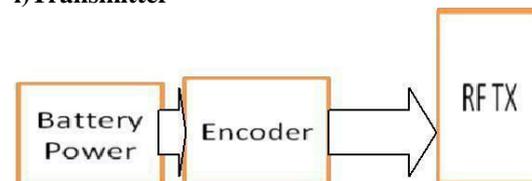


Figure.1. U-turn zone 20 km signboard

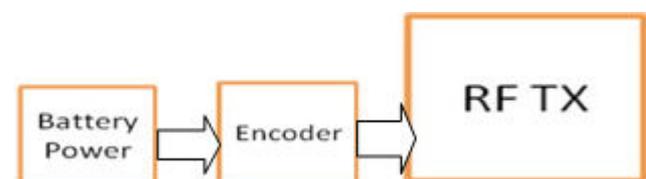


Figure.2. Transmitter design

Transmitter module is placed in the specific zone. Transmitter and receiver both operate at a frequency of 430 MHz. Transmitter receives data serially and sends the data to the receiver continuously. Fig. 1 is the transmitter design.

Receiver Design

Fig. 2 shows the receiver design prototype. The Radio Frequency (RF) module consists of RF transmitter and RF receiver. The RF module has an encoder in transmitter and decoder in the receiver. The encoder is used for encoding the parallel data for transmission while the reception is decoded by decoder in the receiver. The RF receiver is connected with ATmega328P microcontroller. The RF receiver will be always in listening state, if it receives any signal of same frequency as of receiver, it will automatically indicate the micro controller which in turn reduces or limits the speed of the vehicle until the vehicle leaves that particular zone. Passive tags would not be feasible as it has a relatively less range thus we are using active RF module TWS434 and RWS 434 for the proposed system. This module has a range of 500 metres and this range is enough for the real time speed control in roads.

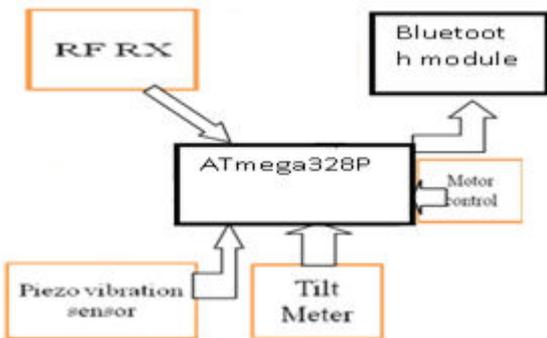
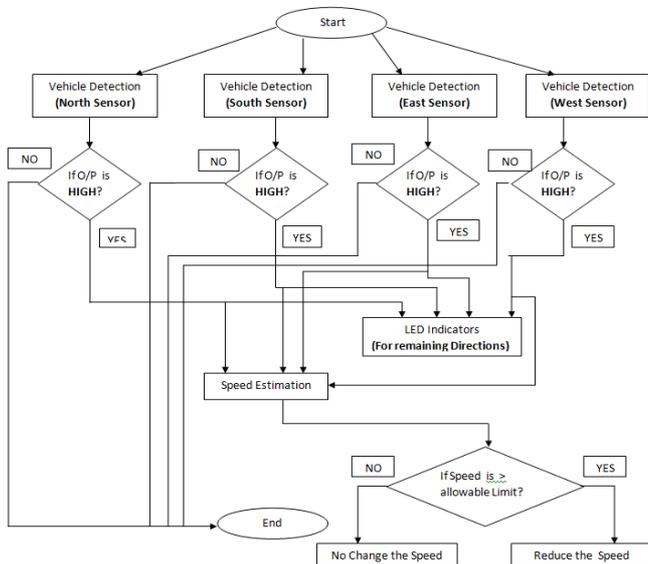


Figure.3. Receiver Design

From this, the accident in school and college zone will get reduced. The three main steps are identifying the accident, locating the position and transmitting the information for help. There are certain parameters that change during accidents which can be detected using sensors that measure these changing parameters. The position of the accident is located using Bluetooth module and android mobile phone data as it is freely available with the help of satellites, and this information about the location of the vehicle is sent through the network to the android phones. mit app inventor software can be used for data sending to phone.

4. FLOW CHART



The sensor (PIR) is placed on the four direction of the road in four ways. if the vehicle detected by the Passive infrared sensor the direction of the vehicle detected will be displayed on the other direction of the roads. And the speed at which the vehicle passes the sensor is measured. if the speed is higher than the set speed, the speed of the motor will be reduced. So that the collision between vehicle from other direction will be avoided.

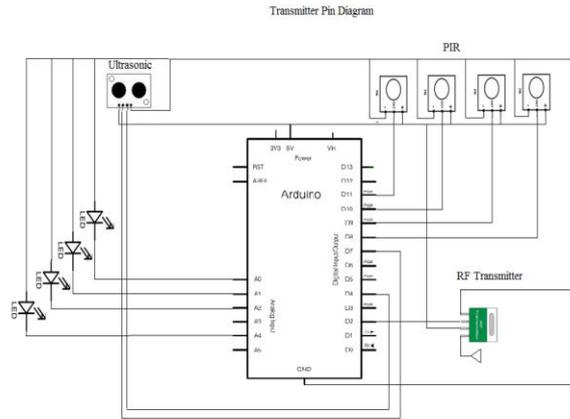


Figure.4. transmitter pin diagram

When the vehicle passes the PIR sensor in a direction the output from the PIR is passed to the LED through the Atmega328p. The RF transmitter is connected to the board so that the detected sensor from the PIR is transmitted wirelessly, And the receiver which is connected to the motor receives the signal and the speed of the motor is controlled. The ultrasonic sensor is used so that it can alert the driver through Buzzer, once the vehicle comes near the Barricade on the road.

5. SOFTWARES USED

Mainly I used three software for the implementation of my project.

- A. Arduino IDE
- B. OrCAD
- C. mit app inventor

A. Arduino IDE

The software consists of a standard programming language consists of a boot loader that executes on the microcontroller ATmega328P. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino Uno board. The Arduino software (Arduino IDE) includes a Wire library to simplify use of the I2C bus. For Serial Peripheral Interface (SPI) communication, use the SPI bus.

B. OrCAD

OrCAD is a software tool used for electronic design automation (EDA). It is used to create electronic schematics and electronic prints for manufacturing printed circuit boards. OrCAD PCB designer consists of various automation features for PCB design, board-level analysis and design rule checks

C. mit app inventor

App Inventor for Android was originally provided by Google and now it is maintained by the Massachusetts Institute of Technology. It is an open source web application. It allows us to computer programming to create software applications for

the android operating system (OS). It allows users to drag-and-drop visual objects to create an application that run on android devices

6. DESIGN PROCESS

The RF transmitter is used for the transmission of data at the rate of 1 to 10 kbps. It will operate at a frequency range of 430 MHZ. RF transmitter is placed in specific zone and RF receiver is placed in the vehicle. The RF receiver also works with same frequency. The transmitted data which is sent by RF transmitter is received by the receiver and is validated. Piezoelectric sensor (vibration sensor) is connected to the port A, which will provide analog value to the ADC port of controller

7. IMPLEMENTATION

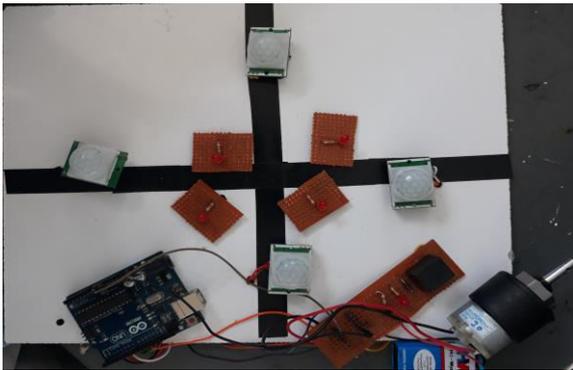


Figure.5. hardware

8. CONCLUSION

This project has been mainly designed in order to avoid accidents. It can be utilized in special areas with sudden sharp & high curved roads. Accidents are prevented in bridges and Ghats sections. Thus speed of the vehicle in school, work zones is reduced. Accidents due to over speed, drowsy and drunken conditions of the driver are prevented. In heavy traffic zone, speed is controlled automatically without the interference of the driver. Thus we can reduce alcohol and drowsy related road accidents. Thus we can bring down the alarming rate of road accidents. Because of the flexibility of the embedded system, this system is compatible to any type of vehicle and is affordable to common man

9. ACKNOWLEDGMENTS

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