A survey on IoT based Signal Monitoring and Car Accident Prevention

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ABSTRACT

Today's 21st century, Road accidents is one of the most vital problem in our developing country. We have to seen number of vehicles increasing day by day, therefore accidents also increasing rapidly. The accident can due to fastest driving, signal jumping, driver can not focus on driving. So, how to give quick action to avoid the accident that all information studied in this project. This project basically on the accident. In this system firstly measure the distance between driving car and front object. When driver does not slow down the speed then system automatically apply the break. And other time car move normal way.

Keywords: Internet of Things (IoT), Ultrasonic Sensor, Colour Sensor, Arduino ATmega328P Micro-controller, Motor Driver, Safety Distance.

ARTICLE INFO

I. INTRODUCTION

Now day's increasing the road traffic is biggest problem of human life. People's are every day travel in heavy traffic. So, there are occured more accident chances. This problem is most serious in our country where close to 6,00,000 road accident causes 1/4th of death and most are insured. For avoid that we have to studied on this problem statement. We have to proposed our "Signal Monitoring and Car Accident Prevention based on IoT" consisting of sensors, motor driver, micro-controller as a hardware. In which car wheels work as output of whole project.

The technique of using Internet of Thing (IoT) can be very helpful for developing such a smart system. IoT has been efficient in technically smart concepts for connected to the real life as a smart home, smart agriculture, smart city and smart security, etc.

Mainly this paper present in depth description of research problem related to traffic monitoring and car accident avoidance[1]. It also present proposed system, literature as well as future innovation.

The proposed system IoT based is help of a processing to process ultrasonic sensor and colour sensor sense the distance and signal colour respectively as a input. Micro-controller is control the all system. Motor driver is work as a interfacing between wheels and controller.

A. Motivation:-

The proposed system motivate to decsrease the death ratio problem in daily life. Hence this growing world of technology, the idea to use smart technological systems with wide future scope can be much more effective[2].

II. METHODOLOGY

The proposed system method of collision detection and avoidance system is mainly composed of distance measurement of front object, calculate the safety distance and respond to driver actions[1].

a) Distance Measurement using Ultrasonic Senser:-

Ultrasonic sensor is calculating distance between car and object. When distance is lowest then system immediate   apply automatically break. And distance is normal as well as medium then car move that ways.

The distance between the sensor and front object is calculated by,

S = C* T/2;

Where,

S = Distance,

C = Velocity of sound, T = Time.

b) Safety distance calculation:-

(1) Psuedo code:-

Step 1: // the setup function runs once when you press reset or power the board void setup()

{

// initialize digital pin LED_BUILTIN as an output.

}

Step 2: // the loop function runs over and over again forever void loop()

{

if (distance1 <= 9 & distance1 >= 6)

{

// Medium Safety

}

else if (distance1 >= 10)

{

// More Safety Distance

}

else if (distance1 <= 5)

{

// Minimum Safety Distance
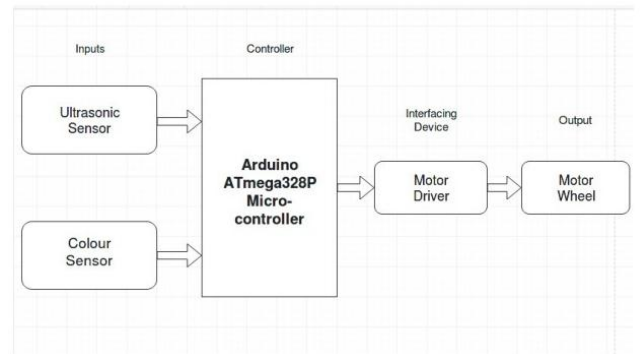
}

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c) Main System Architecture:-

Fig 1. Flow of System

d) Color Sensor:-It is helpful in signal monitoring. Colour sensor sense the red colour for there own frequency and avoid the signal jumping problem.

e) Motor Driver:-Motor driver is used for interfacing between micro-controller and motor.

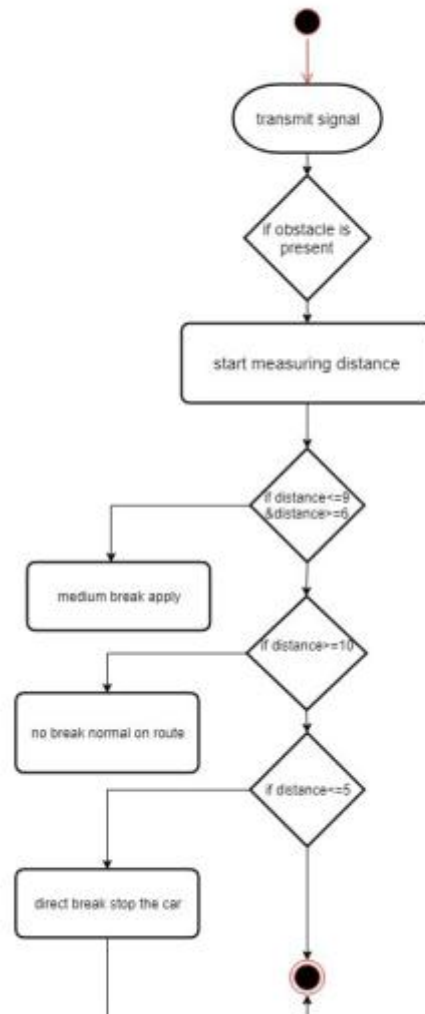f) System Architecture of Distance Measurement:-
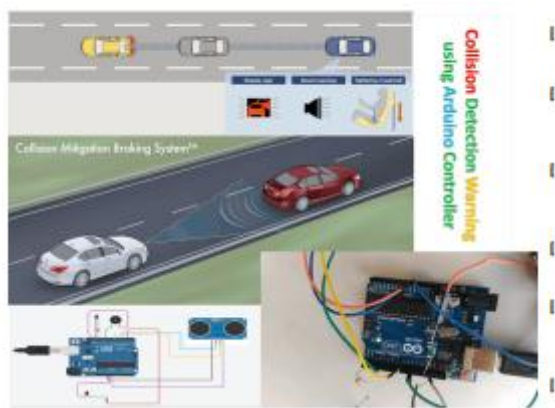

Fig 2. Flow Diagram of Distance Measurement

Fig 3. Accident Avoidance using Arduino ATmega328P Micro-controller

g) Response to Driver Actions:-

If driver slow down the the vehicle as well as increase the distance between front object and driving vehicle then it's okay[1].Refer Psuedo code (1) here.
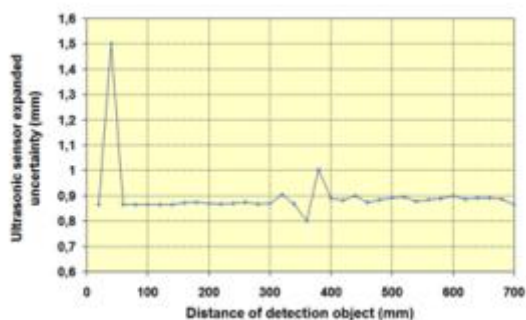
III. CONCLUSION

Fig 3. Graph Of Ultrasonic Collision Avoidance System

With our system, for a safe journy is possible which would be decreases the human injuries during accidents and also reduce the accident rate due to drunken driving. This vehicle accident detection, prevention system provide emergency response at a earliest possible time.

In a future, also add along with this ambulance detection system is also embedded in this project that will be clear the ambulance way by getting indication in our vehicle.

And also this project implement in our actual car also, there all basic concepts are remain same.

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