



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 4, April 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

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# Safety in Hilly Roads Using Modern Techniques

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**ABSTRACT:**In the developing countries accident is the major cause of death. If we gaze at the top 10 dangerous roads in the world, we can see that all of them are mountain roads and curve roads. In the mountain roads there will be tight curves and the roads will be narrow. In these kinds of situations, the driver of a vehicle cannot see vehicles coming from opposite side. Thousands of people lose their lives each year because of this problem. Since we are talking about mountain roads here other side might be led to a cliff. The solution for this problem is alerting the driver about the vehicle coming from opposite side. This is done by keeping an ultrasonic sensor in one side of the road before the curve and keeping a LED light after the curve, so that if vehicle comes from one end of the curve sensor senses and LED light glows at the opposite side. By looking at the LED light on/off criteria driver can become alert and can slow down the speed of the vehicle. This is done by alerting the driver by means of LED light which glows when vehicle comes from the other side of the curve. The vehicle is detected by the help of Ultrasonic sensor which is interfaced to the microcontroller Adriano UNO. By this we can save thousands of lives in the curve roads.

**KEYWORDS:**Ultrasonic Sensor, GSM, PIC Microcontroller, Curve roads, Accident Prevention, Mountain Road, Alerting the Driver.

## I. INTRODUCTION

There are many dangerous roads in the world like mountain roads, narrow curve roads, T roads. In these some mountain roads will be very narrow and they contain so many curves. For example, Kinnear Road in Himachal Pradesh, Zojila Pass in the Himalayas, the Road of Death Bolivia, Fairy Meadows Road (Pakistan)

The problem in these curve roads is drivers can't able to see the vehicle or obstacles coming from another end of the curve. If the vehicle is in very speed, then it is difficult to control and there are chances of falling to cliff. The solution for this problem is alerting the driver about the obstacle or vehicle. Usually, horn is used for this purpose. But in the rainy seasons horn will not be heard. Some people will not use horn itself. So horn is not a good solution to solve this problem. These are the major reasons for accidents. To avoid these problems in curve roads or T roads we are introducing sensor-based accident prevention system. That is, we are keeping ultrasonic sensor in one side of the road before the curve and keeping a LED light after the curve. Ultrasonic sensor which is also called as obstacle sensor sends signal as pulse from trigger. If vehicle is present signal will hit the vehicle and it is received by the sensor at that time light will glow at the other side of the curve. In the absence of the vehicle the signal will not be received by the sensor and the light will not glow. As soon as the light glows driver can slow down his vehicle and he could even stop it if it's necessary. This sensor based light system can be applicable when the driver cannot see the vehicle coming from another end of the road. Using this idea, we can make all the mountain roads and curve roads safer from accidents and can save thousands of lives.

## II. METHODOLOGY

The design of this system mainly consists of two parts; they are hardware design and software design. Hardware design consists of sensors like ultrasonic sensor, a receiving function of ultrasonic sensor is almost same as that of bat. In the presence of vehicle, the sensor senses the vehicle; the light will glow at the other end of the curve. In the absence of the vehicle the sensor will not sense and the light will not glow. This process repeats continuously.



STEP 1: Coding for micro controller Arduino UNO which consists of set of commands to process the data from sensor and to operate the LED as shown in figure below.

```
File Edit Sketch Tools Help
micro
1 const int trig=9;
2 const int echo=6;
3 const int LED=12;
4 const int maxDis=15;
5 const int minDis=5;
6 int dis,Min,Maxdelay=0,Totaldelay=27;
7 void setup()
8 {
9   pinMode(trig,OUTPUT);
10  pinMode(echo,INPUT);
11  pinMode(LED,OUTPUT);
12  Serial.begin(9600);
13 }
14
15 void loop()
16 {
17   digitalWrite(trig,LOW);
18   delayMicroseconds(2);
19   digitalWrite(trig,HIGH);
20   delayMicroseconds(10);
21   digitalWrite(trig,LOW);
22   Min=Time/29/2;
23   dis=Time*100/74;
24   Serial.println(dis);
25   Serial.print("\n");
26   if (dis>maxDis && dis<minDis)
27   {
28     Maxdelay=Totaldelay;
29   }
}
```

Fig.1 Coding for micro controller

STEP 2: Circuit connection having sensor and microcontroller Arduino UNO where the sensor senses the obstacle and the microcontroller arduous UNO processes and operates LED a per the commands as shown in figure below.

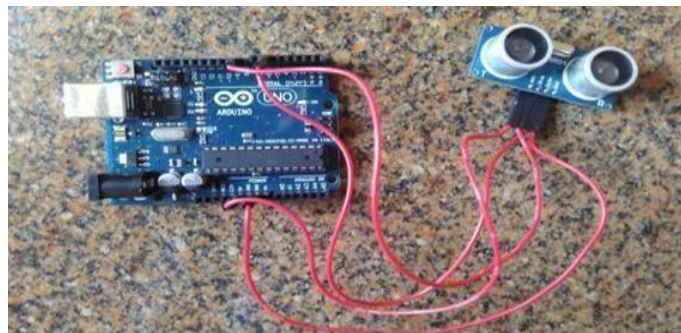


Fig.2 Circuit connection having sensor and microcontroller

STEP 3: Analysing, debugging and running the program. The program is uploaded to microcontroller Arduino UNO. Sensor sends the signal and senses the object and gives the signal information to microcontroller Arduino UNO. Microcontroller Arduino UNO is powered by using laptop. It possesses and the output is shown in the serial monitor.

STEP 4: Fixing the circuit to the model i.e., fixing microcontroller Arduino UNO, ultrasonic sensor and LED light to the model of curve road as shown in figure below.



Fig.3 Fixing the circuit to the model



### **III. CONCLUSION**

The purpose of this paper is to decrease the number of accidents in curve roads. This is done by alerting the driver by means of LED light which glows when vehicle comes from the other side of the curve. The vehicle is detected by the help of Ultrasonic sensor which is interfaced to the microcontroller Arduino UNO. By this we can save thousands of lives in the curve roads

### **REFERENCES**

1. Jessen Joseph Leo., R. Monisha., et.al.: Vehicle movement control and accident avoidance in hilly track, IEEE Int. Conf. on Electronics and Communication Systems (ICECS). pp. 1-5(2014).
2. Ki-Hyeon Kim., Dong-Hoon Yum., et.al.: Improving driver's visual field using estimation of curvature, IEEE Int. Conf. on Control Automation and Systems (ICCAS). pp. 728-731(2010).
3. Dui Tran. Weihua Sheng., et.al.: A Hidden Markov Model based driver intention prediction system, IEEE Int. Conf. on Cyber Technology in Automation, Control, and Intelligent Systems (CYBER). pp. 115-120(2015).
4. Jiang Yuying., Wu Yazhen., et.al.: A surveillance method for driver's fatigue and distraction based on machine vision, IEEE Int. Conf. on Transportation, Mechanical, and Electrical Engineering (TMEE). pp. 727 – 730(2011).
5. Ashutha K., Ankitha K., "Smart Shopping cart using embedded system and wireless module", Recent Patents on Computer Science (CSENG), UAE, Vol. 8, pp. 1-6, January 2016.
6. Ashutha K., Shetty Arpitha., et.al "Novel wireless data communication for fisherman", International journal of computer science and mobile computing (IJCSMC), Vol. 5, Issue 4, pp. 511- 517, April 2016.
7. Ashutha K., Ankitha K., "Error Minimization in BCH Codes", International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering (IJIREEICE), Vol. 4, Issue 5, pp. 402-405, May 2017



**INNO SPACE**  
SJIF Scientific Journal Impact Factor  
**Impact Factor: 8.423**



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STANDARD  
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