COPY RIGHT

IJIEMR Transactions, online available on 9th June 2020. Link

:http://www.ijiemr.org/downloads.php?vol=Volume-09&issue=ISSUE-06

Title: SMART ROAD SAFETY AND VEHICLE ACCIDENT PREVENTION SYSTEM FOR MOUNTAIN ROADS

Volume 09, Issue 06, Pages: 7-11

Paper Authors

G.GOVINDA RAJU, S.T.S.S.LAKSHMI, S.VENKATA NARESH, SK.KAREEM, V.SATYA ANUSHA

USE THIS BARCODE TO ACCESS YOUR ONLINE PAPER

To Secure Your Paper As Per UGC Guidelines We Are Providing A Electronic Bar Code

SMART ROAD SAFETY AND VEHICLE ACCIDENT PREVENTION SYSTEM FOR MOUNTAIN ROADS

[1]G.GOVINDA RAJU,[2]S.T.S.S.LAKSHMI, [3]S.VENKATA NARESH, [4]SK.KAREEM, [5]V.SATYA ANUSHA

[1]Assistant Professor, [2]UG Scholar, [3]UG Scholar, [4]UGScholar, [5]UG Scholar

Electronics and Communication Engineering, V.S.M College of Engineering, Ramachandrapuram, Andhra Pradesh, India.

[1]govindgaraga@gmail.com, [2]thanujasunkara468@gmail.com, [3]snaresh123venkata@gmail.com, [4]kareemshaik811@gmail.com, [5]rajanushav@gmail.com.

Abstract

Growth in population has led to growth in technology. People use the car on a large number and the number of accidents taking place is increasing day-by-day. Road accidents are undoubtedly the most frequent happening cases and overall, the cause of the most damage. There are many dangerous roads in the world like mountain roads, narrow curve roads, T roads. Some mountain roads are very narrow and they have many curves. The problems in these curve roads are that the drivers are not able to see the vehicle or obstacles coming from another end of the curve. If the vehicle is in great speed then it is difficult to control and there are chances of falling off a cliff. Hence there is a need for many road safety systems. To avoid these problems in curve roads of mountain areas, the projects have proposed this vehicle accident prevention system. This accident prevention system using sensors is powered by Arduino board, it consists of IR sensors, LED lights, and buzzer. When two cars pass from the opposite side of a mountain curve the IR sensor senses the car and LED colour changes to red and raises the buzzer giving the signal of danger and then it changes one LED colour into the green to allow the one car to pass and then the other LED colour turns green. In this way, we can prevent the accidents of the curved road.

Keywords: Accident Prevention, Mountain Safety, Road safety

CHAPTER I
INTRODUCTION

Facing a lot of problems, the major problem is accidents. Accidents are quite common on Indian Roads. According to figures by the Road Safety Cell of the Union Ministry of Road Transport and Highways, there were 1.51lakh accidents in 2018 which showed that road accidents last year increased by 0.46% as compared to 2017. According to a survey, crashes on curved segments accounted for 10% of the total number of traffic crashes. Correspondingly, the number of deaths accounted for 13% of the total number of deaths. In Narrow roads, Hilly areas, Ghatssections, negotiating hairpin bends and curves is not an easy task. The driver has to be alert all the time while driving in such situations. Accidents mainly occur due

to over speeding of the vehicle while driving through a sudden curve. In Ghats and hairpin bends, the first preference should be given to vehicles moving uphill. But, rules are not strictly followed and hence resulting in roads blocks and accidents. Safety studies have found that a majority of accidents occur either due to the driver's error or due to the negligence of the safety norms. The statistics show that more number of road accidents take place at blind road corners where we are not able to visualize the incoming vehicle. Vehicles taking a turn assuming no other vehicle is at the opposite end cause major road accidents and results in maximum deaths.

CHAPTER II
EXISTING AND PROPOSED SYSTEM

2.1 Existing System:

1) **Vehicle horn:**

This is one of the traditionalmethod .the drivers on both sides judge the distance of one another based on the intensity of sound this method causes a lot of confusion between drivers

2) **Convex mirror:**

This is the most widely used method is nowadays to a glimpse of any vehicle approaching the bend from the opposite end. The mirror should always clean but in hill areas, it is always cold and misty thereby reducing its visibility.

2.2 Proposed System:

To overcome some of the drawbacks in the existing system we are proposing a system using sensors,

buzzers and Arduino board. When two cars passing from the opposite side of the curve the sensors sense the car and alert the driver to prevent from the accident.
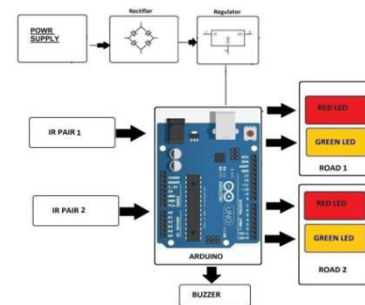

Fig 1:- Block Diagram

2.2.1 Arduino

An AtMega 328P MicroController along with an opensource board which is called as an Arduino Uno acts as a controller to control the defined instructions. The instructions are fed by using an opensource Integrated Development Environment. It has a 14pins among which 8acts as a Digital pin and 6 act as PWM pins. This AtMega 328P MC performs 16MHz cycles in a One second. It also has a push-button to perform reset operation in the case of inappropriate response from the controller board. This device can be operated with power from a USB port which can also be used to dump the code into the controller or we can also switch on the board to operate by using 9V AC-DC Adapter. Each pin gives an output in the range of 5V. The data is transmitted and received to this board using these pins. The status of Transferring data and also receiving data can be predicted by using the onboard Tx and Rx LEDs. This board also have an onboard fixed LED to know the function of the board to use. The platform using code is very user friendly and can be easily processed by any beginner to implement

some amazing results with this type of controllers. This Device also allows different protocols to communicate among devices.

2.2.2 IR Sensor

This IR Proximity Sensor is a multipurpose infrared sensor which can be used for obstacle sensing, colour detection, fire detection, line sensing, etc and also as an encoder sensor. The sensor provides a digital output. The sensor outputs a logic one(+5V) at the digital output when an object is placed in front of the sensor and a logic zero(0V) when there is no object infront of the sensor. An onboard LED is used to indicate the presence of an object. This digital output can be directly connected to an Arduino, Raspberry Pi, AVR, PIC, 8051 or any other microcontroller to read the sensor output. IR sensors are highly susceptible to ambient light and the IR sensor on this sensor is suitably covered to reduce the effect of ambient light on the sensor. The sensor has a maximum range of around 40-50 cm indoors and around 15-20 cm outdoors.
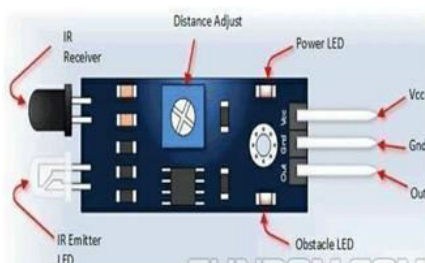

Fig 2: IR Sensor

2.2.3 Voltage Regulator 7805

Allvoltage sources cannot able to give fixed output due to fluctuations in the circuit. For getting constant and steady output, thevoltage regulators are implemented. Theintegrated circuits which are used for the regulation ofvoltage are termed as voltage regulator Ics. Here, we can discuss IC 7805. The voltage regulator IC 7805 is actually a member of the 78xx series of the voltage regulatorIC's. It is a fixed linear voltage regulator. The xx present in 78xx represents the value of the fixed output voltage that the particular ic provides. For 7805 Ic, it is +5v dc regulated power supply. This regulator IC also add a provision for the heat sink. The input voltage to this voltage regulator can be up to 35v and this ic can give a constant 5v for any value of input less than or equal to 35v which is the threshold limit. The function of this pin is to give the input voltage. It should be in the range of 7v to 35v. The unregulated voltage is given to this pin for regulation. For 7.2v input, maximum efficiency can be achieved. In IC 7805 voltage regulator, lots of energy is exhausted in the form of heat. The difference in the value of input voltage and output voltage comes as heat. So if the difference is higher, there will be more heat generation. Without a heat sink, this too much heat will cause malfunction.
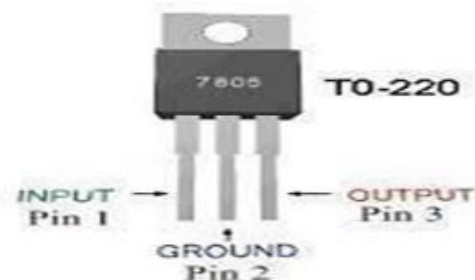

Fig 3:- Voltage Regulator 7805

2.2.4 LED

These diodes convert electrical energy into light energy. The first production

International Journal for Innovative Engineering and Management Research
A Peer Reviewed Open Access International Journal
www.ijiemr.org

started in 1968. It undergoes electroluminescence process in which holes and electrons are recombined to produce energy in the form of light in forwarding bias condition. Earlier they used in inductor lamps but now in recent applications, they are using in environmental and task handling. Mostly used in applications like aviation lighting, traffic signals, camera flashes. A light-emitting diode (LED) is a two-lead semiconductor light source. It is ap–n junctiondiode, which emits light when activated.[4] When a suitable voltage is applied to the leads,electrons are able to recombine withelectron holes within the device, releasing energy in the form ofphotons. This effect is calledelectroluminescence, and the colour of the light (corresponding to the energy of the photon) is determined by the energybandgap of the semiconductor. An LED is often small in area (less than 1 mm2) and integrated optical components may be used to shape its pattern. Appearing as practical electronic components in 1962, the earliest LEDs emitted low-intensity infrared light. Infrared LEDs are still frequently used as transmitting elements in remote-control circuits, such as those in remote controls for a wide variety of consumer electronics.

2.2.5 BC 547

The BC547 transistor is an NPN Epitaxial Silicon Transistor. The BC547 transistor is a general-purpose transistor in small plastic packages. It is used in general-purpose switching and amplification BC847/BC547

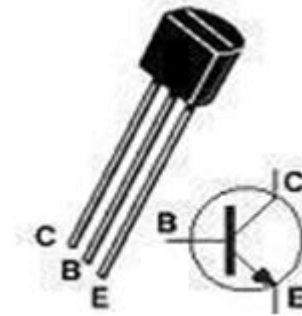series 45 V, 100 mA NPN general-purpose transistors.

Fig 4:- BC 547

It is basically an NPN bipolar junction transistor (BJT). The word transistor is a combination of two words, transfer and resistor. So, the basic purpose of a transistor is the transfer of resistance. A transistor is normally used for amplification of current.

CHAPTER III
RESULTS

The Project Smart Road Safety and vehicle accident prevention system for mountain roads has been successfully completed and tested. This project is mainly helpful for drivers while driving in mountain roads.
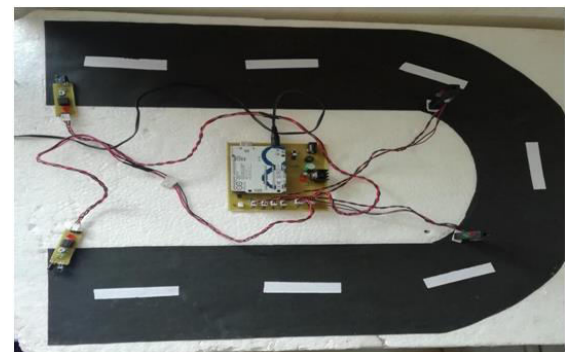

Fig 5:- Result

CHAPTER IV
CONCLUSION

The purpose of this project is to decrease the number of accidents occurring on hilly and curved roads. 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 the vehicle comes from one end of the curved sensor senses and LED light glows at the opposite side. By this, we can save thousands of lives including animals.

FUTURE SCOPE

This system can also use for counting the number of vehicles and the usage of solar energy can be a great extension for this system. Decrease the size of the unit so that it occupies a small place and easily kept in narrow 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.International Journal of Advanced Research and Publications ISSN: 2456-9992 Volume 1 Issue 5, November 2017www.ijarp.org 436 Diminishing Road Accidents On Sharp Curves Using Arduino RANGA SREEDHAR GALLA GokarajuRangaraju Institute of Engineering and Technology, Department of Electrical and Electronics Engineering.

3.Pawan Deshpande, International Journal of Advanced Engineering Technology, ROAD SAFETY AND ACCIDENT PREVENTION IN INDIA: A REVIEW

4.Aravinda B, Chaithralakshmi C, Deeksha, Ashutha K "Sensor-Based Accident Prevention System" International Journal of Innovative Research in Electrical, Electronics, Instrumentation And Control Engineering Vol. 4, Issue 6, June

5.Kartik Venkata Mutya, Sandeep Rudra "Road Safety Mechanism to Prevent Overtaking Accidents" International Journal of Engineering Trends and Technology (IJETT) – Volume 28 Number 5 - October 2015.

6.D. Haripriya, Puthanial. M, Dr. P. C. Kishore Raja "Accident Prevention Systemand Security for Vehicles" International Journal of Computer Trends and Technology (IJCTT) – volume 12 number 5 – June 2014.

7.Stephen Eduku, Mohammed Okoe Alhassan, Joseph Sekyi "Design of Vehicle Accident Prevention System Using Wireless Technology" International Journal of Scientific and Research Publications, Volume7