International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 04 | April -2020 ISSN: 2582-3930

REVIEW ON CLASH AVOIDANCE AT HAIRPIN BENDS USING IR SENSOR

MO.Sudharsana[1], Mr.N. Kumar[2],

[1]PG Student, Department of Computer Science, Dr.N.G.P. Arts and Science College, Coimbatore, Tamil Nadu, India.
[2]Assistant Professor, Department of Computer Science, Dr.N.G.P. Arts and Science College, Coimbatore, Tamil Nadu,

---

Abstract -The main aim of this project is to provide a safe and comfort hill travel by avoiding the accident mainly at hairpin and U curves. As roads are the most commonly used way to Highlands and is fully filled with hectic and endless blind spot curves leads to accident. By this project we will alert the vehicle drivers approaching Hair Pin or U curves through LED Signals that intern reduce accidents. This make journey to High Lands much safer. This is Ghats Vehicle Alerting System Project, in this IOT project; we are using 2 IR sensors, Arduino board and the status indications LEDs Red & Green. In a Ghats road when the vehicle is coming from one direction, these 2 IR sensor senses that there is a vehicle is coming and the alert signal is sent.

Key Words:IR Transmitter, Receiver, Arduino UNO, Arduino IDE, Led lights.

1.INTRODUCTION

In this paper, The Ghats vehicle alerting system used for safer journey in the hill station, Ghats sections, Hairpin bends and U curves [1]. While driving in the Ghats section there is many accidents that lead to serious injuries or even death. Mainly this accident happens because of Hairpin bend and U curves while turning in this Ghat area. It becomes difficult to see vehicle coming from opposite side. If two vehicles come at a same time while turning it creates a chance of accidents and it becomes difficult to handle. In the night, because of no streetlights it becomes a difficult task of driving on Ghats and especially while turning. It becomes more difficult at night to make a turn as vehicle coming from another side of road is not visible due to darkness [2]. Driver has to be alert all the time while driving in such situations. Accidents mainly occur due to over speeding of vehicle while driving through a sudden curve. In Ghats and hairpin bends, first preference should be given to vehicles moving uphill. But, rules are not strictly followed and hence resulting in roads blocks and accidents. In existing system drivers are unable to judge which and when vehicles arrive at curves. Hence, we have developed a model using which drivers can negotiate the curve and judge the arrival of the vehicles from the other end more confidently [1].

2. GHAT ROAD

Ghats Roads are access route into the mountainous with amount of hairpin bends, which is very risky as compare to normal routes. So chances of accidents in Ghat section is more because of narrow road width, sharp bends, improper camber, valley side etc[2].

Fig -1: Ghat road

3.ROAD ACCIDENT IN GHATS SECTION

Road accident in Ghats section are mainly happens because of Hairpin bend and U curves. while driving the vehicle in the Ghats area it made some accident in the turning. The accident is made serious injuries or even death. It becomes difficult to see vehicle coming from opposite side. If two vehicles while turning in a hairpin bends or U curves at a same time it creates a chance of accidents and it becomes difficult to handle. In the night, because of no streetlights it becomes a difficult charge of driving on Ghat sections [2].

Fig -2:ROAD ACCIDENT IN GHATS SECTION

4.METHODOLOGY

Ghats Roads are access routes into the hilly roads with the number of hairpin bends, which is very perilous as compared to normal routes. So chances of accidents in Ghat sections is more because of narrow road width, sharp bends, improper camber, valley side etc. We plan to overcome this problem by placing an IR sensor on one side of the roads and alerting the driver about the obstacle or vehicle in Ghats sections. In these we use two IR sensors to senses the vehicle from the downhill road and give alert to the other side vehicle with signal. When the signal is green, it indicates that it is safe to take turn, which means there is no vehicle coming in the opposite direction. These two IR sensors can give input to the Arduino and this Arduino will send data to the LED lights, which directs for vehicle.

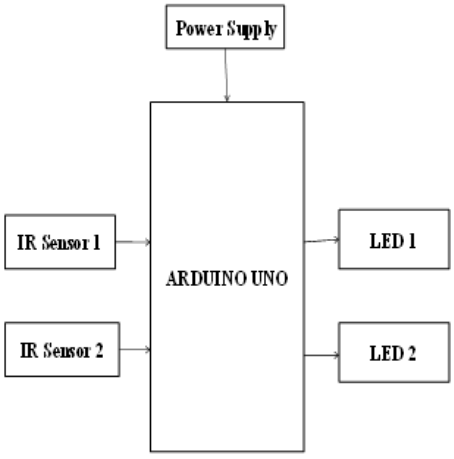

Fig -3:Block diagram

5.LITERATURE SURVEY

1. The paper titled "alerting system in ghats section (Mahendra Reddy, et.al., June 2019)" is proposed a system to decrease the number of accidents in curve roads. This was 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 was interfaced to the microcontroller Arduino UNO. However sensor based light system is implemented using wire which is difficult to maintain. In this paper they used Arduino UNO and connection wired technology.

2. The paper titled "Sensor based accident prevention system in curving and declining road accidents on sharp curves using Arduino (Ranga Sreedhar Galla, et.al, November 2017)" is proposed a system to decrease the number of accidents in curve roads. This was 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 was interfaced to the microcontroller Arduino UNO. However sensor based light system is implemented using wire which is difficult to maintain. In this paper, they used Arduino UNO and wired technology.

3. The paper titled "advance road safety for Ghats road's at hairpin bend(Harshada Targe et.al., Jan-2018)" is proposed a

Technique consisting of two CCTV cameras and two LCD screens, which displays the live view, captured from the CCTV. But this system is the initial cost price of camera is high moreover the installations of CCTV camera may also increase the initial expenditure depending upon the complexity of the CCTV camera system. The CCTV camera system can only monitor a limited area and CCTV camera might not catch all activity due its positions. In this paper, they used Arduino with CCTV and LCD technology.

4. The paper titled "Collision Avoidance algorithm (Chitransh Srivastava, et. al., 2016)" is proposed a system for the collision avoidance system for hairpin bends in Ghats using proximity sensors are consisting of a microcontroller, IR sensors, warning LEDs. The systems have performed exactly under various conditions prioritizing the vehicles negotiating a hairpin bend on a mountainous track, Ghats etc. This simple yet efficient methodology will enable the driver to have an enhanced sense of landscape and radically reduce road accidents in hairpin bends or other kinds of zero visibility

turns. Even though this paper is that Infrared sensors cannot work in dark environments and inability to use them in sunlight due to interference. Infrared sensor values normally alter in departure light conditions. In this paper they used Arduino and jumper wired technology.

6.COMPONENT USED

6.1 IR Transmitter and receiver sensor

An infrared sensor is an electronic device that produces in direction to sense some phases of the environments. An IR sensor can the heat quantity of an object as well as detects the wave. These types of sensors measure only infrared radiation, rather than producing it that is called a passive IR sensor [5]. IR Transmitter and receiver are used to switch any expedient wirelessly, means remotely. TV remote and TV are the best sample of IR transmitter and receiver. TV generally consist TSOP1738 as the IR receiver, which senses controlled IR beats and convert them into electrical signal [6].

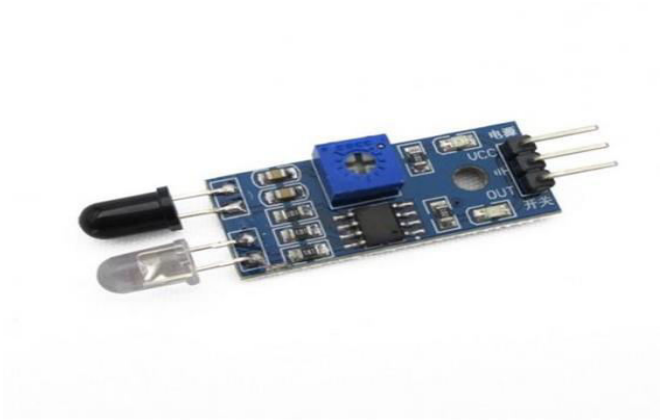

Fig -4: IR Transmitter and receiver sensor

6.2 Arduino uno

The Arduino Uno is an open source microcontroller board which is used to insert the code as input using USB and can get the excepted output. This platform consists of physical programmable path board and or IDE (Integrated Development Environment) that runs on computer, used to mark and upload computer code to the physical board [6].

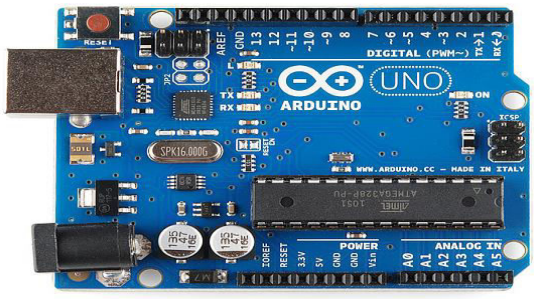

Fig -5: Arduino Uno Board

6.3Led lights

A semi-conductor light source that produce light when current emits through it is called light-emitting diode (LED). Electrons in the semiconductor recombine with electron holes, release energy in the type of photons. The colour of the light is determined by the energy required for electrons to cross the group gap of the semi-conductor [7].

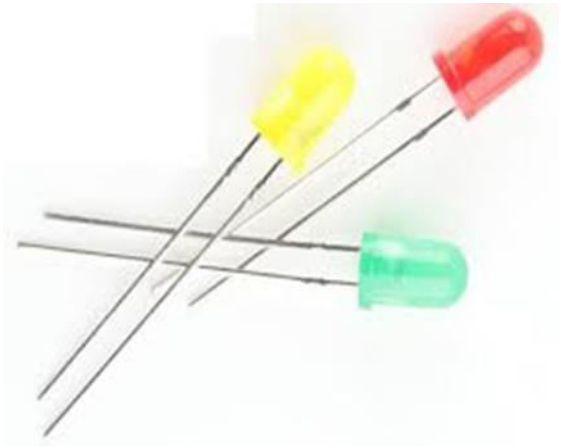

Fig -6: LED Lights

6.4 Jumper wires

Jumper wires are plainly wires that have connector pins at each end, allowing them to be used to attach two points to each other without soldering. Jumper wires are typically used with breadboards and other prototyping tools in order to make it easy to change a circuit as needed [8].

Fig -7: Jumper wires

7.ADVANTAGES

1. Avoid accidents at curve roads and hairpin bends in Ghats section

2. Saves thousands of lives.

3. Easily implementable to the existing roads.

4. In these, it can be fully automated, that is no person is requisite to operate.

5. The cost of Installation is very less.

8.CONCLUSION

The purpose of this paper is to decrease the number of accidents in curve roads. This is done by warning 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 IR Transmitter and Receiver sensor which is interfaced to the microcontroller arduino UNO. By this we can save thousands of lives in the curve roads. We understand the causes and effect of accidents and then founded out a solution introducing a new technique to avoid such accident. The new technique consists of two IR sensors to alert the vehicle of the opposite road. This help in reducing the accidents and to enjoy the safer ride.

REFERENCES

[1]1)Chitransh Srivastava, 2)NikhilA charya,3)FervezJafferB.M."Implementation of Collision avoidance system for hairpin bends in ghats using proximity sensors" 3,Sachin Bhat4 1Manipal University, 2Visvesvaraya TechnologicalUniversity,3Visvesvaraya TechnologicalUniversity,4Reva University.

[2]1)Harshada Targe,2)Anushka Mahajan, 3)Mohit Patil,4)Yogesh Lilake,5)Vijay Sonawane"Advance Road Safety For Ghat Road's At Hairpin Bend" 1,2,3,4 Students, Civil Engineering Department, K.K. Wagh Polytechnic, NASHIK, Maharashtra, India 5Professor, Civil Engineering Department, K.K. Wagh Polytechnic, NASHIK, Maharashtra, India

[3]https://en.wikipedia.org/wiki/Ghat_Roads

[4] https://www.elprocus.com/infrared-ir-sensor-circuit-and-working/

[5] https://circuitdigest.com/electronic-circuits/ir-transmitter-and-receiver-circuit

[6]1)B.Rama Murthy,2)O.Jagadish,3)K.Tanveer Alam,3)V. Mahammad Dada,2)K. Priyanka Gandhi "Development of GSM Based Advanced Alert Home Locker Safety Security System Using Arduino UNO" 1Professor, Department of Instrumentation & USIC, India 2Resarch Scholars, Department of Electronics, Sri Krishnadevaraya University, Anantapur, Andhra Pradesh, India 3Assistant Professor(C), Department of Electronics, Rayalaseema University, Kurnool, Andhra Pradesh, India.

[7] https://en.wikipedia.org/wiki/Light-emitting_diode

[8]http://blog.sparkfuneducation.com/what-is-jumper-wire