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IR Employed Arduino Based Accident-Avoidance Hilly Areas

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Abstract: In arising nation, the majority of the demise is due accident. The accident ratio is increases in the hilly area due to the fog and landslide. Also, in the hilly roads they have narrow U turns due to this the driver of a vehicle cannot see vehicle coming from opposite site.

Due to fog the driver cannot find the road if they are not familiar with the road and they got accident. Many of the people loses their life due to this problem.

The solution of the problem of the vehicle comes from opposite way is solving by using of IR sensor, which sense the upcoming vehicle and blow up the red led opposite side of the road. Due to this the opposite side driver know about the vehicle coming from opposite side and it wait the passing of the vehicle. Those drivers who not able to see the road in the fog we install the red led around the road which indicate the position of the road and driver must have follow to it due to this the driver will avoid falling into the ditch.

We also install the humidity and the temperature sensor wo always indicate about the temperature and the humidity, Due to this those people who have this type of problem they avoid to go these places. Due to this the accident ratio is decreases. And the main point is the whole equipment is running on renewable energy resources.

Keyword: U Turn/Blind Turn Road, Mountain Roads, Accident Prevention, Alerting Driver, IR Sensor, Temperature and Humidity Sensors, Follow Path, Renewable energy.

I. INTRODUCTION

The sudden increase in the vehicle traffic in the tourism spots in the hilly areas resulting in congestion leading to uprooting of the smooth functioning of the traffic [1]. As a result, number and rate of accidents keeps on piling day by day. The situation even leads to fatal accidents taking away life and property as well disturbing the common life of the natives. Hence to overcome this our proposed idea delivers a smooth and effective maneuvering of the traffic on such places.

This paper describes the addressing of these menaces using IR module sensor along with Arduino system for smooth operation [2]. The system gathers the information about the movement of the from the opposite side and informs to this side of the road. The sensing and display of the system is lightning fast and accurate. Along with the system it also offers effective route following mechanism at such fatal points to help guide through them. This offers optimum results at low visibility and foggy conditions when chances of mishaps are at zenith [3].

II. PROPOSED IDEA

There are a number of turns (blind spots) on the mountains which if not drove carefully and safely may lead to loss of life and property. This system is installed on these points and functions to deliver about the traffic from the upcoming side [4].

Here the proposed idea for installation is on the hairpin bends where there is little cue about the upcoming traffic. The IR sensor works to sense the upcoming vehicle and send the signal to display the number of vehicles approaching and display them on the display board. For e.g., if two vehicles are approaching from one side and from the other side the sensor will sense the number of vehicles and display them. Here two vehicles will be displayed on the other side of the road and three on the other side board.

III. COMPONENTS

Arduino UNO, IR Sensor, 2N2222a Transistor, 7805 Regulator, Buzzer, Resistor 220-ohm, Green LED, Red LED.

IV. ARDUINO UNO

Arduino is an open-source stage involving both are actual programmable circuit board (frequently alluded to as a microcontroller) and a piece of programming that can be introduced on the PC, used to composed and transfer PC code to the actual board. The Arduino programming deals with all known working framework. It is an integrated development environment (IDE) that furnishes software engineers with device like a source code editorial manager, computerization instruments, and debugger (Arduino, 2018). There are a few variations of the Arduino equipment including the Arduino UNO which is utilized for this review. The Arduino board is a crucial part in this plan. It has an inbuilt Atmel ATmega328p microcontroller which per uses and report signals from the DHT11 sensors.



Fig: - 1. Arduino UNO

V. IR MODULE

IR Sensor are utilized to detect attributes in its encompassing by emanating as well as recognizing infra radiation and are prepared to do estimating the hotness being radiated by an item recognizing movement.

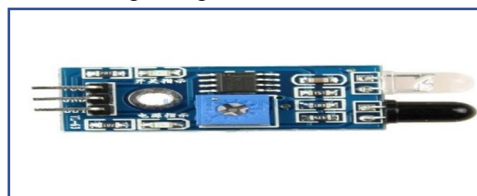


Fig: -2 IR Module

VI. TRANSISTOR

The 2N2222A is a typical NPN bipolar intersection semiconductor (BJT) utilized for universally useful low-power enhancing or exchanging applications. It is intended for low to medium current, low power, medium voltage, and can work at decently high velocities.

VII. REGULATOR:

The LM7805 is a voltage controller that yields +5 volts. It is three pin IC: Input pin For tolerating approaching DC voltage, ground pin for laying out ground for the Controller, and results pin that supplies the positive 5 volts.

VIII. BUZZER

The ringer is a sounding gadget that can change over sound signs into sound signs. It's s normally fueled by DC voltage. The ringer utilized the piezoelectric impacts of the piezoelectric earthenware production and utilization the beat current to infer the vibration of the metal plate to create the sound.

IX. RESISTOR

220m resistance is addressed by Red, Red, dark code.

X. LEDs

Our framework utilizes sensors to recognize any vehicles arriving at hairpin curve and cautions quickly on opposite side vehicles by red sign and furthermore delivers alert sound, otherwise green LED is displaye.

XI. DHT11 HUMIDITY TEMPERATURE AND SENSOR

Varying temperature and humidity information of the environment are captured by the DHT11 component. It is a temperature and Humidity. Sensor has an adjust advanced signal result. The DHT11 guarantees a high dependability and long-haul solidness by utilizing the restrictive advanced signal-procurement strategy and temperature and moistness detecting innovation. With a resistive type mugginess estimation part and a temperature estimation part, the DHT11 gives a solid information. Its component is adjusted in the research facility understanding very precise stickiness adjustment conditions and stores the alignment coefficient in memory as programs for some time in the future. The temperature and stickiness sensor utilized for this study has an inclusion scope of up to 20meters. It orders with standard reference temperature for modern estimation which is given as 200 c – 250 c; details of how this was arrived at were discussed by Doiron (2007).



Fig: -4 DHT11 Humidity Temperature and Sensor

XII. LCD

In this study, a LCD (Liquid Crystal Display) was used as a monitor showing messages on the screen. A 16 by 2 LCD, was used for this study which was suitable for the task. This implies that the LCD has two (2) showcase lines with each line showing 16 characters. Although this class of LCD requires a 16-pin connection, a lesser number can be used if only four (4) data lines are used instead of the default eight (8) data line connection.

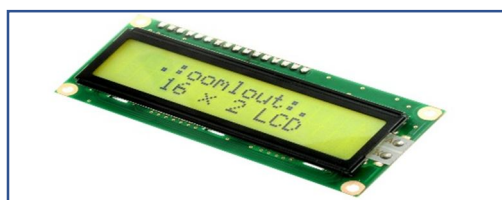


Fig: -5 LCD

XIII. PROJECT WORKING

The IR sensor placed on the hairpin bend, the counter and the LEDs, all are connected with the Arduino along with the path follower circuit. When any car approaches the bend, the infrared signal is identified by the IR sensor and is then shipped the Arduino which displays it. contemporarily the signal to the path circuit also gets activated and the intensity of the LEDs connected to the path circuit is increased in presence of any vehicle or object. The path circuit is always on standby and increases when any vehicle approaches the bend [6]. The counter employed here counts the number of vehicles detected and is used to display them on the board. The Arduino here works as to provide some delay to the signals, otherwise as soon as the vehicles move out of zones of IR sensor the LCD do not show anything, hence to hold-on signal for some time Arduino is being employed. Arduino also serves as to collect data from the DHT11 temperature and humidity sensor and displays the surroundings data on the LCD panel. All system will work with renewable energy sources [7],



Fig: - 6 Project Working

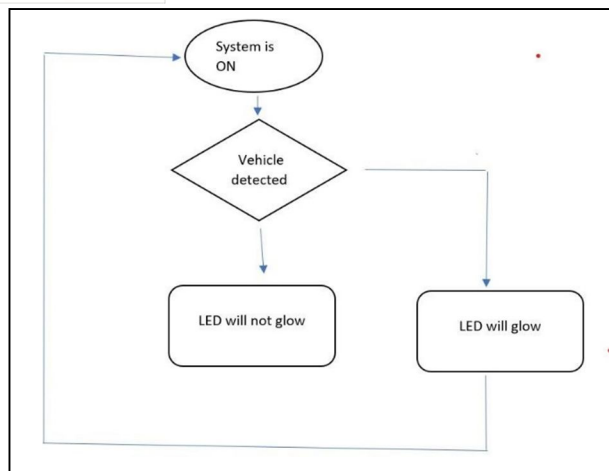


Fig: -7 Flow chart of IR Working

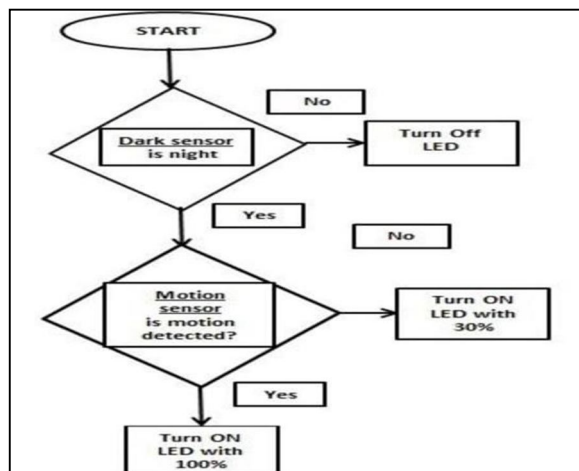


Fig: - 8 LDR Circuit Working

XIV. CONCLUSION

As in today's world the more data we have more options we will have to effectively take decisions. As with the cases at hairpin bend at rather high altitude we will have more information about the surrounding and upcoming traffic to help us to safely maneuver our vehicles. This system aims to provide as much as information to the commuters so as to minimize the mishaps on the mountainous hairpin bend as even little false step and the outcome can be very fatal. Also, the powering of such system poses a great challenge which is further reduced by the use of renewable sources of energy.

REFERENCES

- [1] Wasu Pautare1, Rohit Pautare1, Pratik More1, Akash Bhagat1, Shubhangi Pantawane1, SakshiBawane1,2020, Safety in Hilly Regions by using WSN & IoT, International Research Journal of Engineering and Technology (IRJET), Volume: 07 Issue: 05 | May 2020
- [2] Anand M G1, A Dhanyakumar2, Bhaskar N3, Mahaling S B4, Sensor Based Accident Prevention System in Curving, IJARIE-ISSN(O)-2395-4396, Vol-5 Issue-2 201
- [3] P.Deepika, S.Sathya Priya, C.Priya, M.Surya, Smart Secure and Warning System in Hair Pin Bends at Hill Stations Based on Zig Bee Technology, International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8 Issue-4, November 2019
- [4] Dixit Chauhan1, Preyash Kathiriya2, Jay Pithiya3, Ridhhish Chinaiwala4, Mohit Bhalala5, RajKakadiya6, Prevention Measures on Blind Curve of Hilly Area, International Journal of Research in Engineering, Science and Management, Volume-3, Issue-3, March-2020
- [5] Kaliampakos D., Giannakopoulou St., Katsoulakos N. (2009). Introduction to the Environment and Society of Mountainous Areas. Lecture notes for the course "Introduction to the Environment and Society of Mountainous Areas", MSc "Environment and Development of Mountainous Areas", NTUA.
- [6] Sabya Sanchi Kanoji, "Real-time Traffic light-control and Congestion avoidance system", International Journal of Engineering Research and Applications (IJERA), Vol. 2, Issue 2, Mar-Apr 2012, pp.925-929.
- [7] Katsoulakosa, D. Kaliampakosb, Renewable Energy Potential and Mountains Areas: Exploring an Intrinsic Relation, 3rd International Exergy, Life Cycle Assessment, and Sustainability Workshop & Symposium (ELCAS3) 07 -09 July, 2013, NISYROS - GREECE
- [8] Dwaipayan Saha1*, Indrani Mukherjee2, Jesmin Roy3, Sumanta Chatterjee4, Smart Safety and Accident Prevention System for Mountain Roads, International Journal of Computer Sciences and Engineering Open Access, Vol.-8, Special Issue-1, Feb 2020



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