INTERNATIONAL JOURNAL
FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Review Paper on Vehicle Accident Prevention System for Hilly and Mountain Roads

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Abstract: In the developing countries there are many dangerous roads where accidents and causes very lethal effects now a day. If we talk about dangerous roads in the world then all of them are mountain roads, T roads, narrow roads. Some mountain roads are narrow, having many curves and very tight, this cause of the most hazards.
Vehicle accident prevention system can be crucial step in accident safety on hilly and mountain roads. We have recognized our past, thousands of accidents and death on mountain road, some even fall of the cliff and after that can not view even be traced. Such accidents not only destroy human life but also major loss financially to the individual and government also. To avoid such problems in curve roads mountain areas, we have proposed this vehicle accident prevention system. The main objective of this model is to diminish the accident in hairpin bends an U turnings.Sometimes it observes that the vehicle driver unable to see the vehicle reaching form opposite side due to lack of vision and the serious accidents are happened. Though this type of project ideas can help to decrease these type of peoblems.
Keywords: Arduino, Cables & Connector, IR Sensors, Power Supply, PCB Breadboards.

I. INTRODUCTION

According to million death study (MDS) about 2.3 million people die in India per year. In that 137K is because of road accidents. That about 377 peoples per day. In that 3.7% because of unexpected obstacles.There are many risky roads and bends in the world like mountain roads, narrow curve roads and hair pin bends for ex. Kolli hill roads, Gata Loops,3-Level Zig-zag roads in Sikkim, Leh Manali Highway.

The problem in the hair pin bends is that the drivers are unable to see the vehicle or obstacles coming from opposite side of the curve. If the vehicle is in high speed, then it is difficult to control the speed of the vehicle and there are chances of falling to a cliff and sometimes people not get traced. Not only accident is common thing for this type of places but also many vehicles even fall off the mountain with no trace of the vehicle as well as driver this type of accident seen many times. This cause many human life loss as well as destruction of roads. Mountain roads are generally very narrow and any accident on such roads can even cause it to close the road for many days till the road to be cleared. We have also read and hear some news about mountain road remain close for many days after some minor as well as major accident or natural calamities are happened. The vehicles involved in the accident need to remove safely.

Sometimes heavy machinery need to be bring to remove the vehicle from cliffs or valleys. This is also a massive task. This is also a massive task. This cause many losses of money, time, lives of people involves in accident and peoples stuck on the roads for many hours or days. Usually convex mirrors or horns are used for this purpose, but it is not valid.

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue IV Apr 2021- Available at www.ijraset.com

II. LITERATURE SURVEY

A. "Sensor Based Accident Prevention System" Author: Aravinda B, Chaithra Lakshmi C, Deeksha, Ashutha K[1]

This paper is 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 light will not glow because the signal will not be received by the sensor. As the signal senses the vehicle light will glow that is indication to driver that some vehicle is arriving from the front side. The driver get noticed the signal and slow down or stop the vehicle if necessary. This type of sensor based light system can be applicable when the driver unable to see the vehicle coming from other 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 a year. The aim 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 micro controller Arduino UNO. By this we can save thousands of lives in the curve roads.[1]

B. "Diminishing Road Accidents On Sharp Curves Using Arduino". Ranga Sreedhar Galla [2]

has studied the main purpose of this paper is to reduce accidents on hilly and slippery roads. In curve roads the other road end of vehicle cannot seen by driver. At night many time accidents may happens by huge intensity of head light from opposite side of vehicles. Also, the light intensity problem occurs both curved roads and mountain roads at night because of these type of problem Thousands of people lose their lives. 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.[2]

C. "Smart Road Safety and Vehicle Accident Prevention System for Mountain Roads" Kartik Venkata Mutya, Sandeep Rudra[3]

Has studied the road traffic accidents are being recognized as a major public health problem in number of countries with alarmingly increasing fatalities in developing countries. Careless and rash driving as a result of excessive waiting and blind corners is attributed as one of the most important factor for all road accidents. An estimated 1.2 million people lose their lives in road traffic crashes every year, and another 20 to 50 million are injured. A docile, economical mechanism to prevent these road accidents is the need of the hour. It is hoped that the mechanism presented in this article would help in alleviating this concern especially in correspondence with large vehicle accidents on highways by being easily implemented in low income countries and this mechanism can save thousands of life.[3]

D. R. Saranya, R. Arun Kumar [4]

This paper conclude that, Accidents may takes place in various factors drunk and driving, Texting while driving, Speeding, Distractions, Sleeping while driving. Among Drowsiness is reason for most of the accidents. While driving at the speed of 100km/hr. driver falls sleepy within 4 seconds the buzzer will enables.[4]
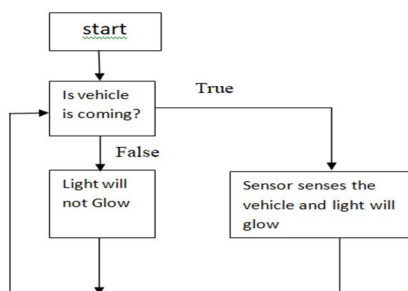
E. Flow Chart

Fig 3.1: Flowchart for working principle of sensor based accident prevention system.

In the above flowchart as explain, in the presence of vehicle from the opposite side sensor senses the vehicle and the light will glow, at the other end of the curve red LED glow for half minute. On the other hand in the absence of the vehicle the sensor will not sense and the light will glow as green. This process repeats continuously.
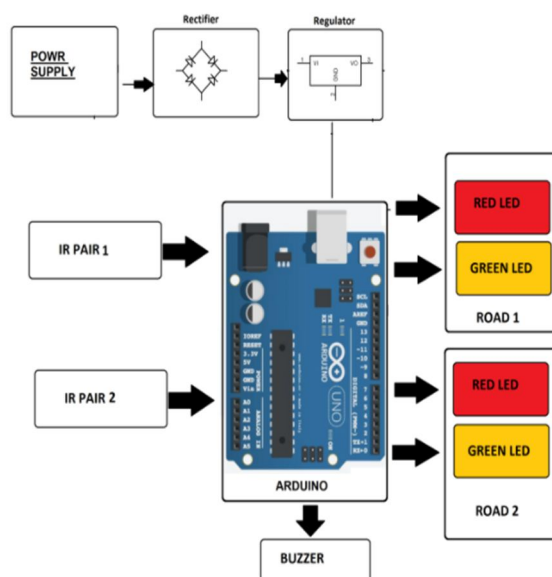
F. Proposed Work

Fig 4.1: Block diagram of purpose system

Our project is vehicle accident prevention for hilly and mountain roads using Arduino. This project is helpful to reduce accidents happening in dangerous area like hilly and mountain roads. If the vehicle is in very high speed then it is difficult to control the speed of the vehicle and there are chances of falling to cliff. The solution for this problem is alerting the driver about the obstacle or vehicle coming from opposite side of the valley i.e. we are use infrared (IR) sensor for sensing the vehicle or obstacle coming from another curve. This accident prevention system uses Arduino board, IR sensors, LED lights and buzzer. We are keeping IR sensors in both side of the road before the curve and keeping a LED light after the curve. IR sensor sends signal as pulse from trigger. When two cars pass from the opposite side of a mountain curve reaching towards each other the IR sensor senses the car and LED colour changes to red and raises the buzzer giving signal of danger and then it changes one LED colour into green to allow the one car to pass and then the other LED colour turns green.

Hence, by using this system we can make all the hilly roads and curve roads safer from accidents and can saves thousand of lives

III. SOFTWARE & HARDWARE REQUIRED

The following are the software and hardware required to implement the desired recommendation system.

A. Software Required
1) Arduino IDE is an open source software which makes easy to write code for microcontroller Atmega 328 and allows to upload on board. The environment is written in java and based on processing and other source software.
2) Arduino IDE can be used on Windows, Linux (Both 32 and 64 bits), and Mac OS.
3) Current versions are Arduino 1.5x Beta Version.

B. Hardware required:
1) Arduino Uno
2) IR Sensors
3) Cables and connectors
4) Power Supply
5) PCB and Breadboards
6) Buzzer
7) Regulator
8) LED

IV. ADVANTAGES

A. Avoid accidents in mountains roads, curve roads, and hilly roads.
B. Saves thousands of lives.
C. Easily implementable.
D. Fully automated (No person is required to operate).
E. Installation cost is very less.

V. FUTURE SCOPE

A. Arrangements to protect the sensor from being damaged in critical places.
B. Decrease the size of unit so that it occupies small place and easily kept in narrow roads.
C. Implementing the system to detect number of vehicles and velocity of vehicle and try to specticate the natural calamities if happen alert may rise on buzzer for no further accidents.

VI. CONCLUSION

The purpose of this project 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 IR sensor which is interfaced to the microcontroller arduino UNO. By this we can save thousands of lives in the curve roads.

In our country there is a massive need for a modern technological solution for safety measure on mountain roads specially the curved section of the road. This project will definitely ensure the safety of drivers on mountain roads and hence will make sure human lives are saved. This project is a modern solution to this problem and will ensure safety and reliability.

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