PROJECT REPORT ON

Smart Road safety and accident prevention System on mountain

The Project report is submitted to

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Of

Bachelor of Technology in Electronics Engineering

By

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<u>CERTIFICATE</u>

This is to certify that the project report entitled "Smart Road safety and accident prevention System on mountain" has been successfully done by VAISHNAVI PIMPLE ,ANSHUL SONKUSALE ,AJINKYA LADHE &ANURAG THEMDEO under the guidance of Prof S. A. Dhondse as a part of Electronicsworkshop practice in 4th semester of Electronics Engineering, Yeshwantrao Chavan College of Engineering (An Autonomous Institution Affiliated to Rashtrasant Tukdoji Maharaj Nagpur University).

Signature:
**Name: Prof S. A. Dhondse**

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Abstract:

There are many dangerous roads in world where accidents are the major cause of death. Looking at most dangerous roads in the world which are mountain roads and curve roads. In the mountain roads are narrow and very tight which causes severe accidents. The main objective of this project is to reduce the accidents in hairpin bends and U turnings. Vehicle drivers generally not able to see the other side view this cause accidents. Through this project we can able reduce these types of problems. In this project two led's connected with two ultrasonic sensor which will be placed inthe abovementioned placed. It is mainly used to avoid the accidents on hill station because the driver not able to see another side of vehicle which is called blind spot. By using signal and sensor based system. The movement of vehicle is tracked by sensor and it indicates vehicle movement to the drivers using signal. The Objective 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

CIRCUIT DIAGRAM:

Schematic from software
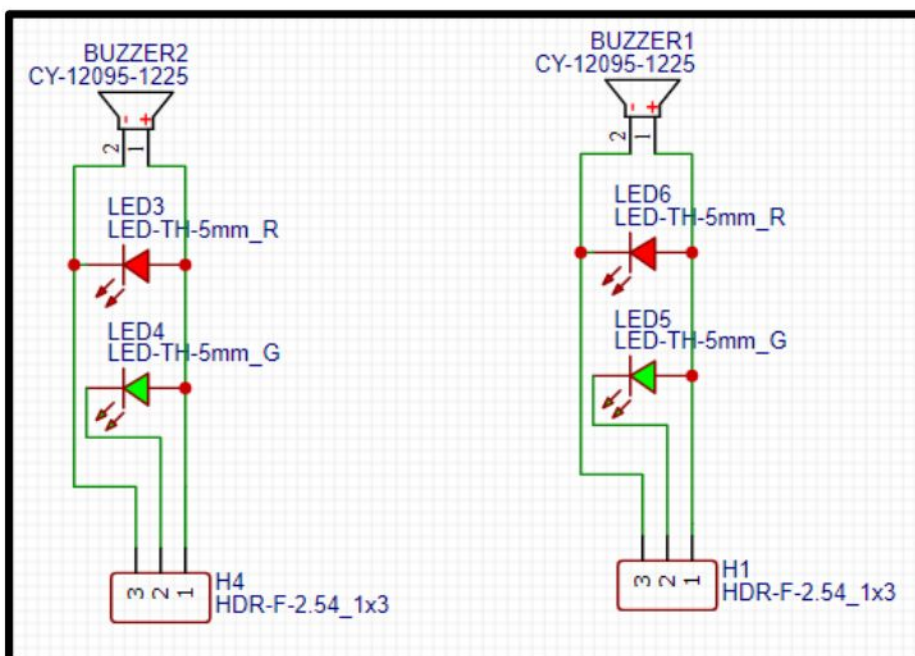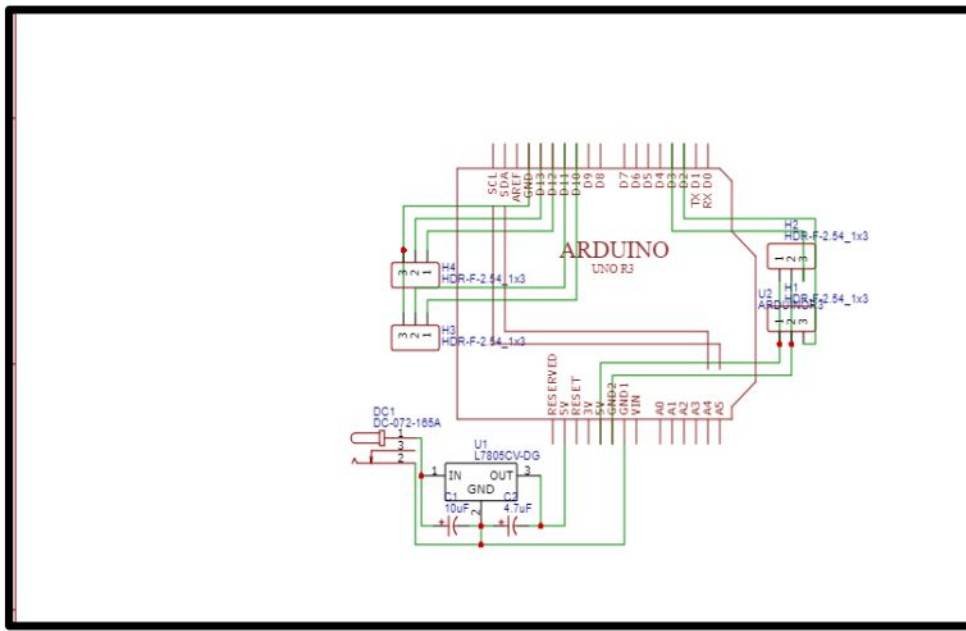
Working

Usually horn is preferred to alert other drivers but in the rainy seasons there is least chance of hearing horn sound. So concluding horn as solution isn't right. In order to overcome these problems we are introducing sensor based automatic accident prevention system for mountain roads. Here sensor is installed in one side of the road before the curve and keeping a LED light after the curve. sensor (obstacle sensor) sends signal in form of pulse. If vehicle is present, signal hits the vehicle and then it is received by the sensor. During this time LED present at the other side of the curve starts glowing. In the absence of the vehicle the above procedure will not occur. The driver can slow down the speed of vehicle when the light glows and if it's necessary he could even stop the vehicle. This system is applicable when the driver cannot see the vehicle coming from other end of the road. All the mountain roads and curve roads can become safer from accidents by this system application and thousands of life can be saved The design of this sensor based accident prevention system consists of two parts; they are hardware design and software design. Hardware design consists of elements like ultrasonic sensor, a microcontroller and LED sensor works on +5V DC supply and has range from 2 cm to 100 cm. Microcontroller Software design is done by using Arduino 1.0.5 IDE tool which is open source software and Programming can be done by using embedded C or C++. The LED light used utilisesmaximum +5V DC supply.

Components Description :

1) *Capacitor*: A capacitor is a device that stores electrical energy in an electric field. It is a passive electronic component with two terminals.

2) *IR Sensor:*The IR sensor or infrared sensor is one kind of electronic component, used to detect specific characteristics in its surroundings through emitting or detecting IR radiation. These sensors can also be used to detect or measure the heat of a target and its motion.

3) *3 pin connectors:*The three-pin version (non-PWM) is referred to by some computer technicians as a "TX3 connector," but this is something of a misnomer (similar to the moniker "Molex connector," referring to the once-common 4-pin ATX power connectors originally produced by AMP).Electrical connectors are classified into three types based on

theirtermination ends: board-to-board connectors, cable/wire-to-cable/wire connectors, and cable/wire-to-board connectors.

4) *DC SOCKET:*DC plug, for one common type of connector) is an electrical connector for supplying direct current (DC) power.

5) *VOLTAGE REGULATOR IC:* A voltage regulator is an integrated circuit (IC) that provides a constant fixed output voltage regardless of a change in the load or input voltage

6) *BUZZER:*An electrical device that makes a buzzing noise and is used for signalling. A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.

7) *LED :*A light-emitting diode (LED) is a two-lead semiconductor light source. It is a p-n junction diode that emits light when activated.[5] When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence, and the color of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor. LEDs are typically small (less than I mm2) and integrated optical components may be used to shape the radiation pattern.

8) *ARDUINO :*Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board

Part List

Table 1: Components

Components	Part Number	Unit Price	Quantity	Total Price
IR SENSOR		50	2	100
3 PIN CONNECTOR		10	6	60
DC SOCKET		10	1	10
ARDUINO		550	1	550
VOLTAGE REGULATER IC		10	1	10
CAPACITOR	10uf , 4.7uf	4	2	8
BUZZER		15	2	30
LED	RED LED GREEN LED	3	4	12
Total:-				**Rs. 780**

Table 2: footprints

S.No.	Componets	Footprint Name
1)	ARDUINO	ARDUINOR3-BPLACE
2)	3 PIN CONNECTOR	HDR-F-2.54_1*3
3)	DC SOCKET	DC-IN-TH_DC-072-165A
4)	VOLTAGE REGULATOR IC	TO-220-3_L10.0-W4.5-P2.54-L
5)	CAPACITOR	CAP-TH_BD10.0-P5.00-D1.0-FD
6)	BUZZER	BUZ-TH_BD12.0-P7.60-D0.6-FD
7)	LED	1. LED-TH_BD5.0_RED 2. LED-TH_BD5.0_GREEN
8)	IR SENSOR	

CONSTRUCTION
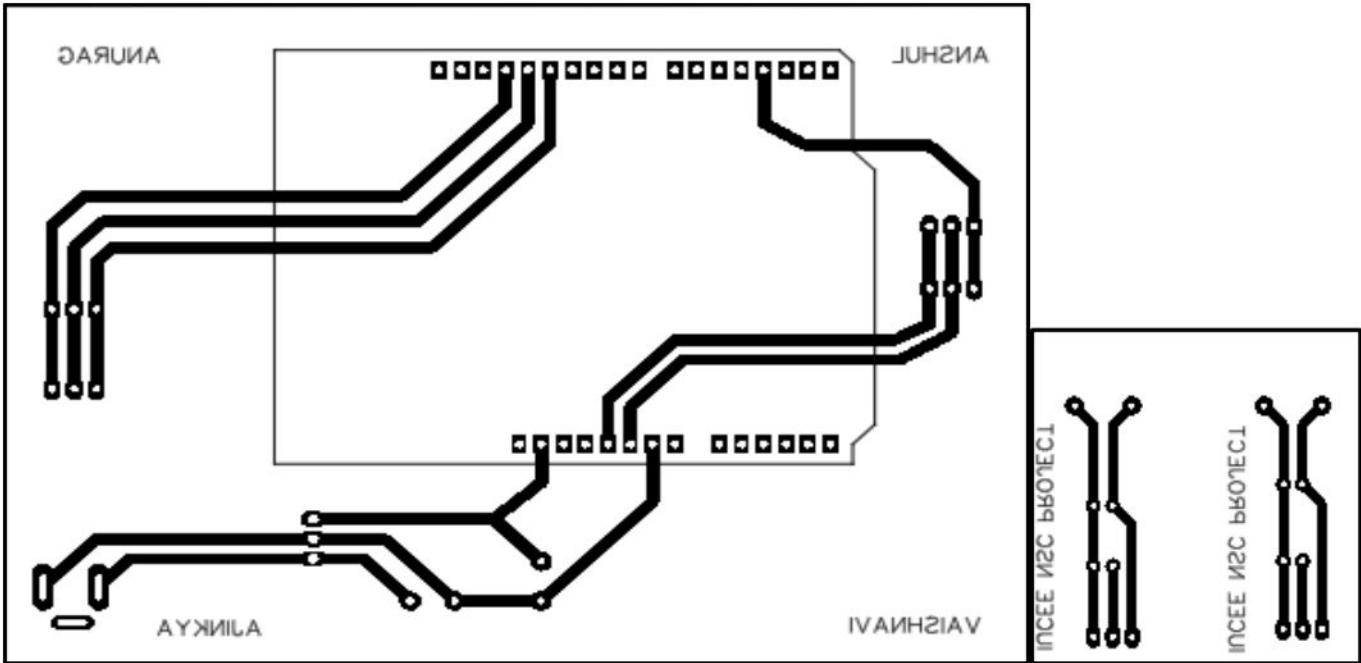
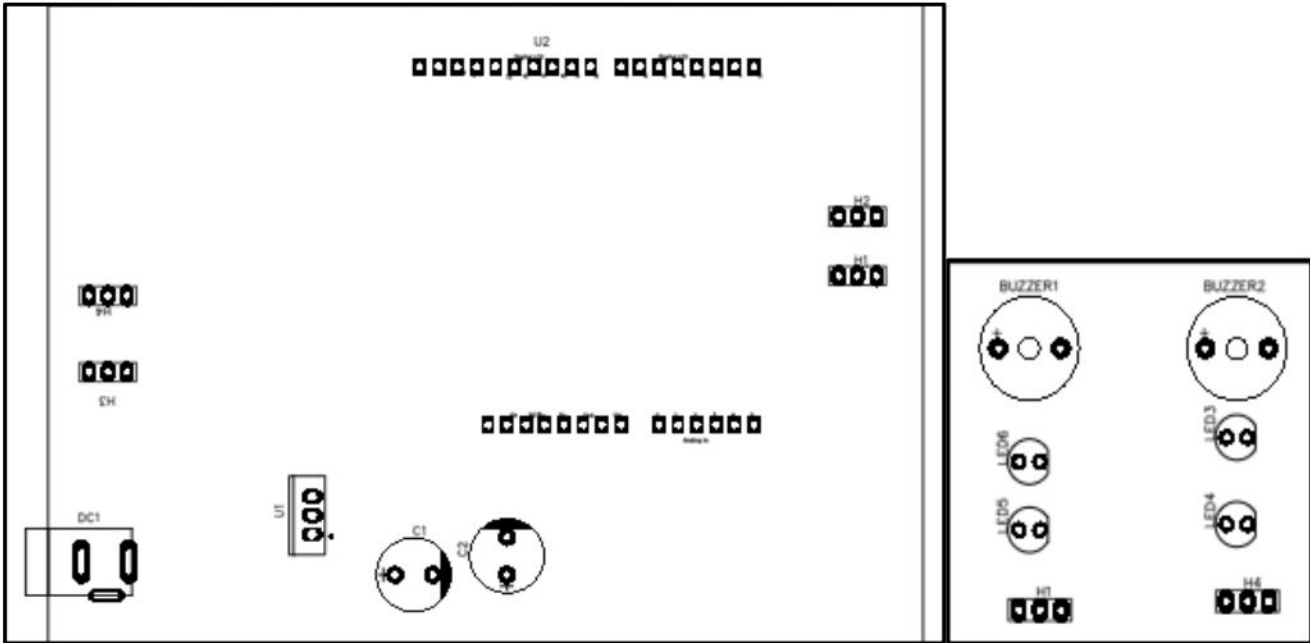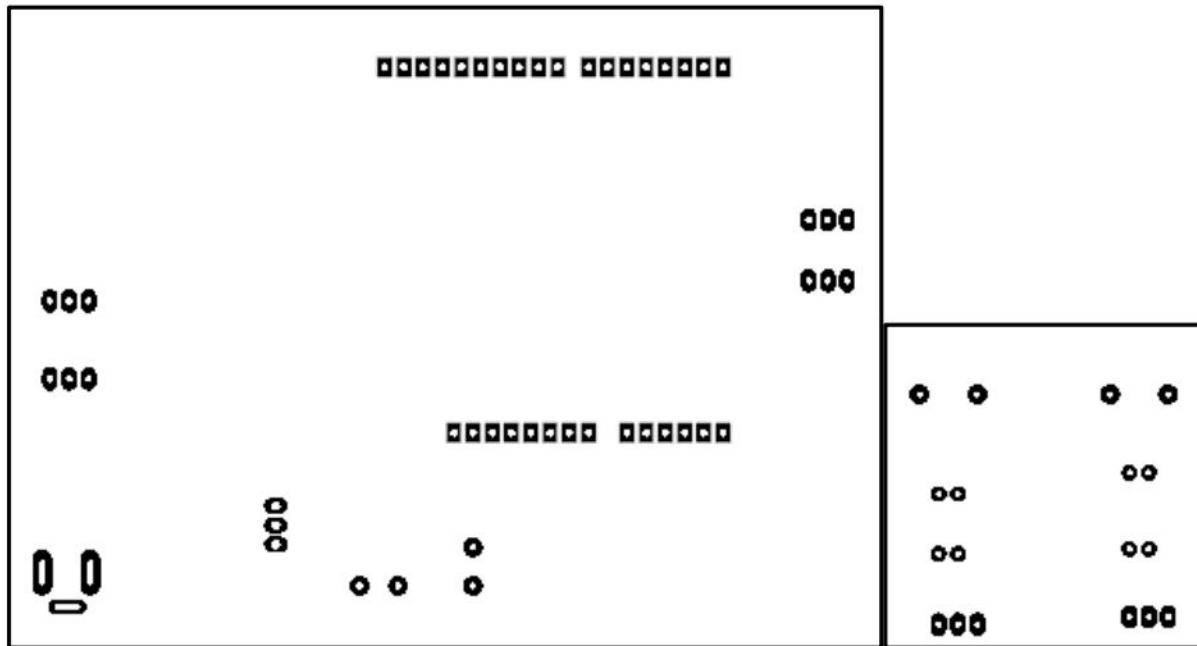## Fig 1: Schematic from software
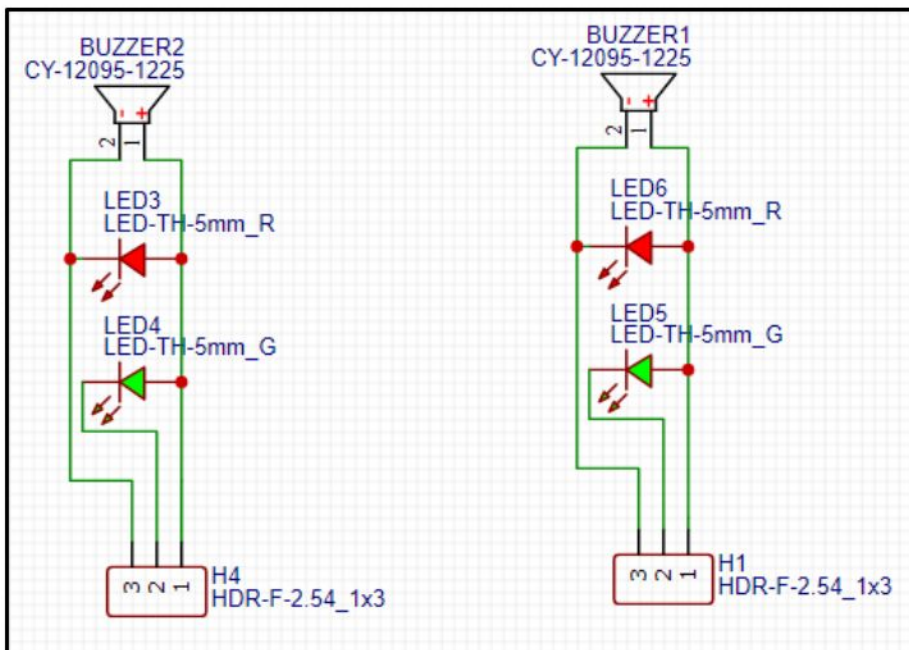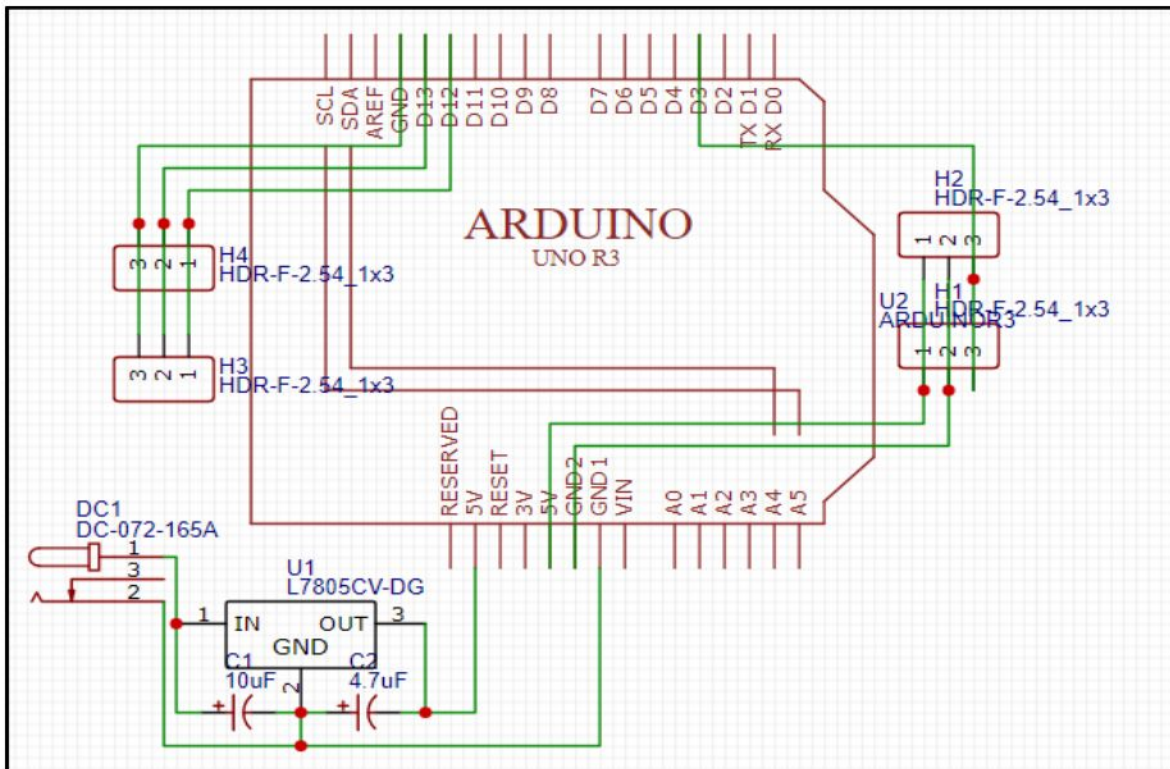
Fig. 2: PCB Layout

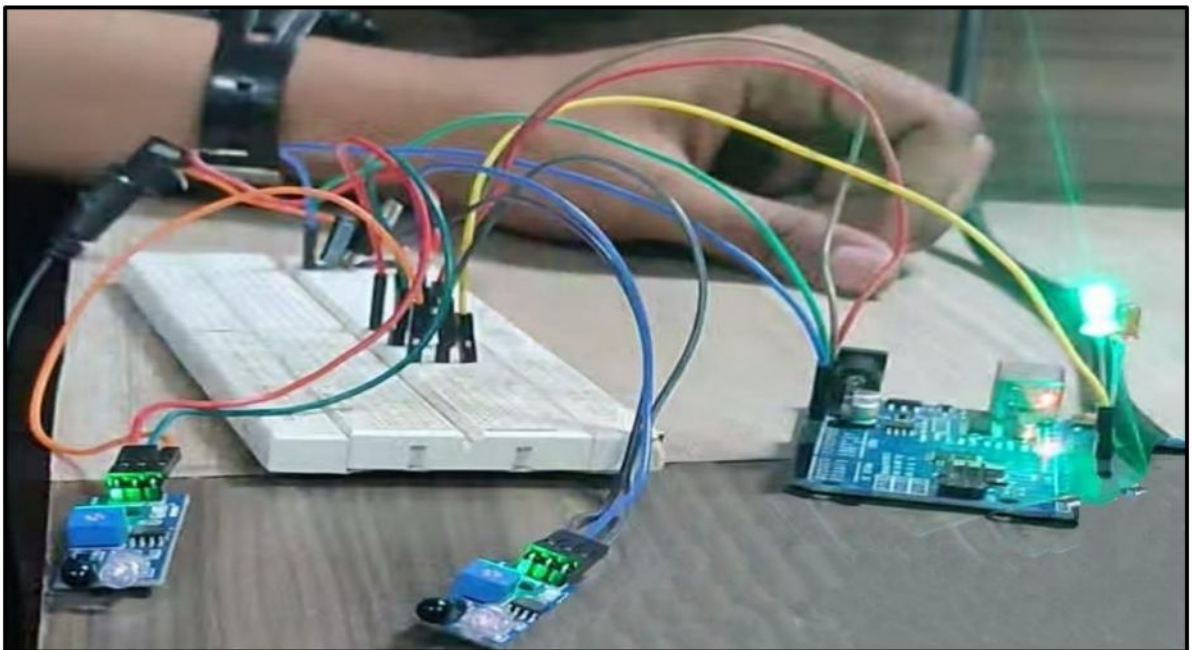Fig. 2: PCB Layout
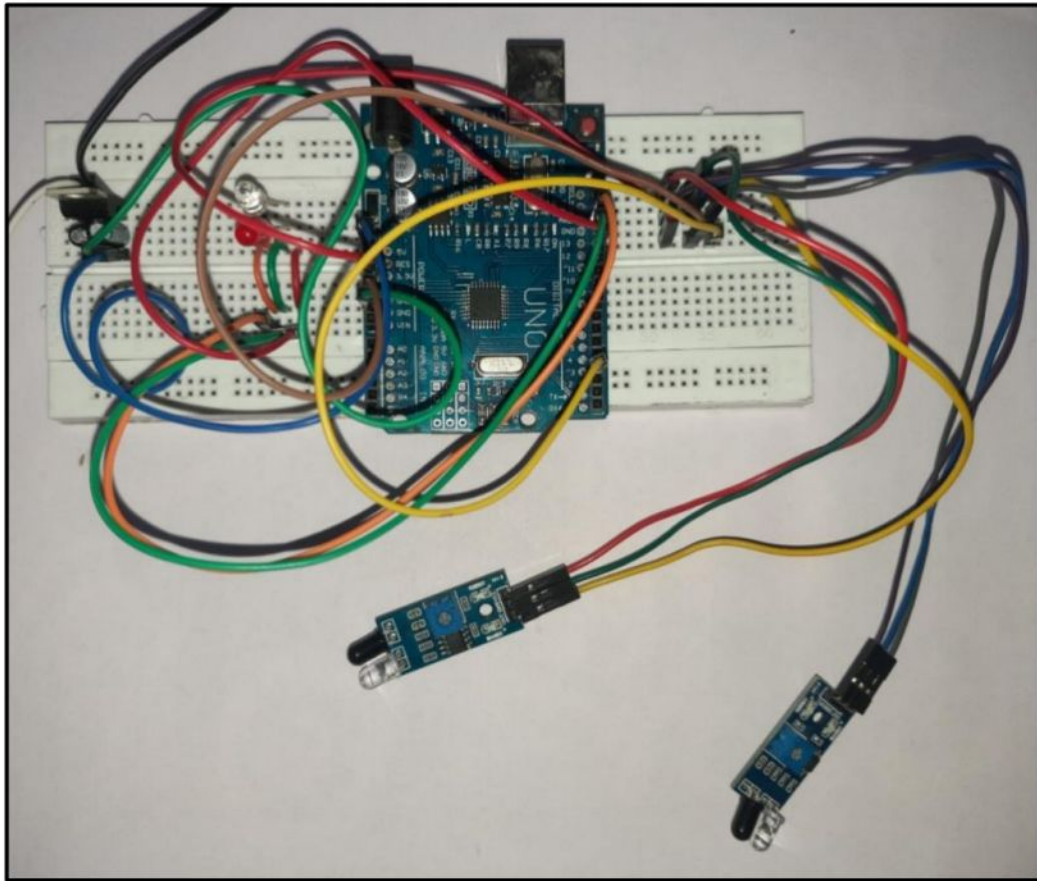
Fig. 3: Silkscreen
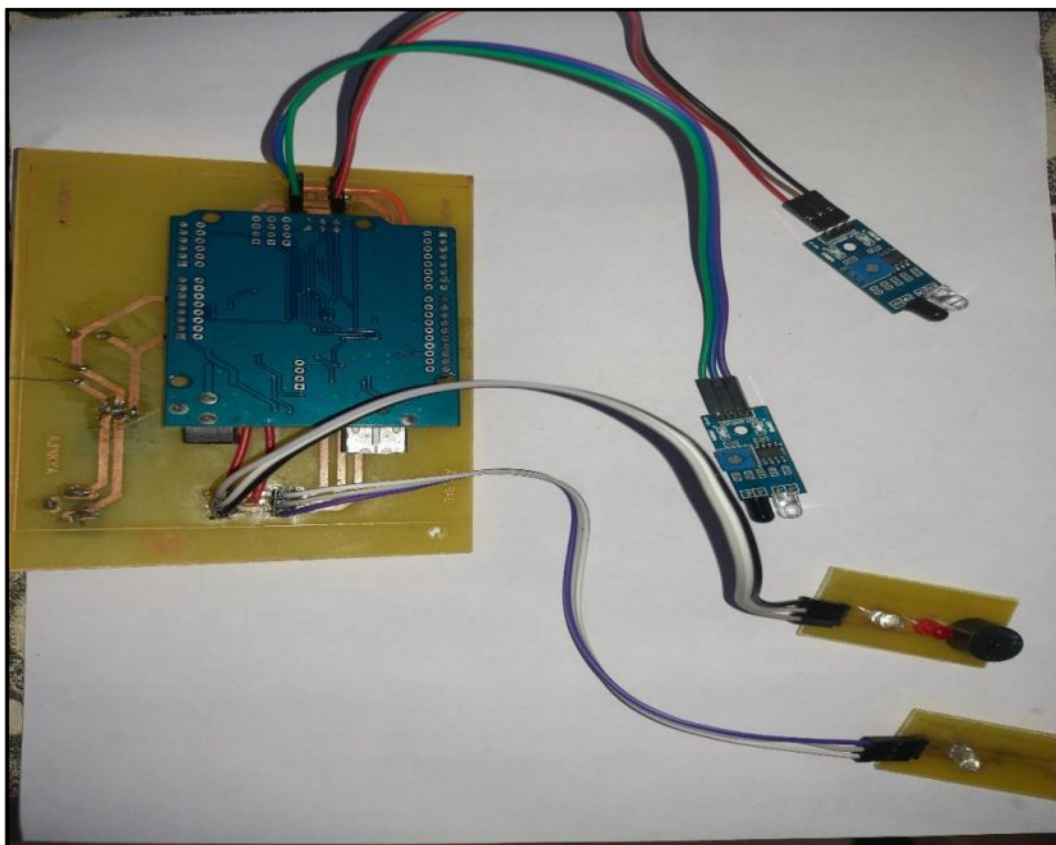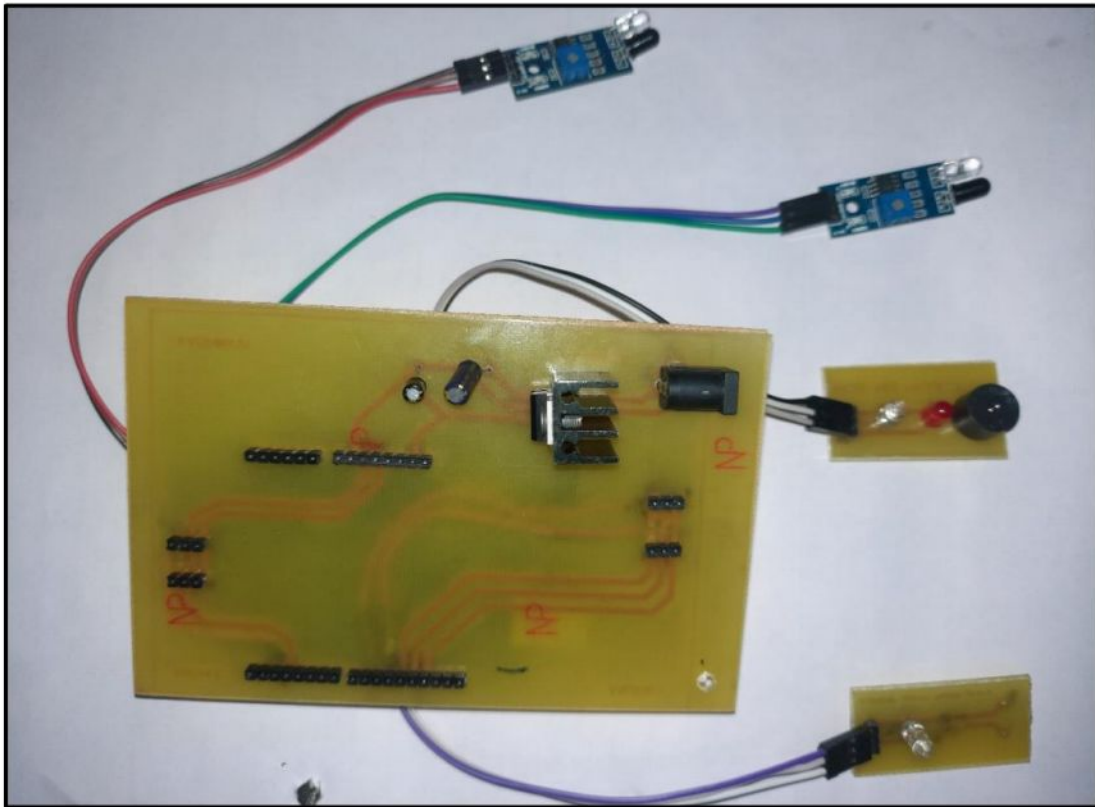

Fig. 3: Silkscreen

Fig. 4: Drill Layer

TESTING

Testing on Breadboard

FINAL CIRCUIT

Applications:-

1.Avoid Accident in curve roads mountain roads and on hill roads

2.Saving Thousand of lives

3.Easily Implementable to the existing roads

4.Vehicle Monitoring system can be implemented easily

REFERENCE

1) www.google.com
2) www.wikipedia.com
3) www.nevonproject.com