AUTOMATIC RAILWAY GATE CONTROL SYSTEM AND OBSTACLE DETECTION

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Summary of stage 1

- This project deals with one of the most common problem of gate control at the railway crossings. since the existing system are operated manually ,accidents at rail road crossing are increasing day by day. To reduce accidents and manual effort , we want to use automatic railway gate control system .
- In Stage - 1,we implemented module 1i.e gates closing and opening at railway level crossing.In this module when train arrives at the first IR sensor,the gates will be closed and the red LED will be turned ON .When the train reaches second IR sensor the gates will be opened and green light is indicated.

Implementation of Experimental Design

- Closing and opening gates
- Countdown system for closing gates
- Obstacle Detection

Architecture

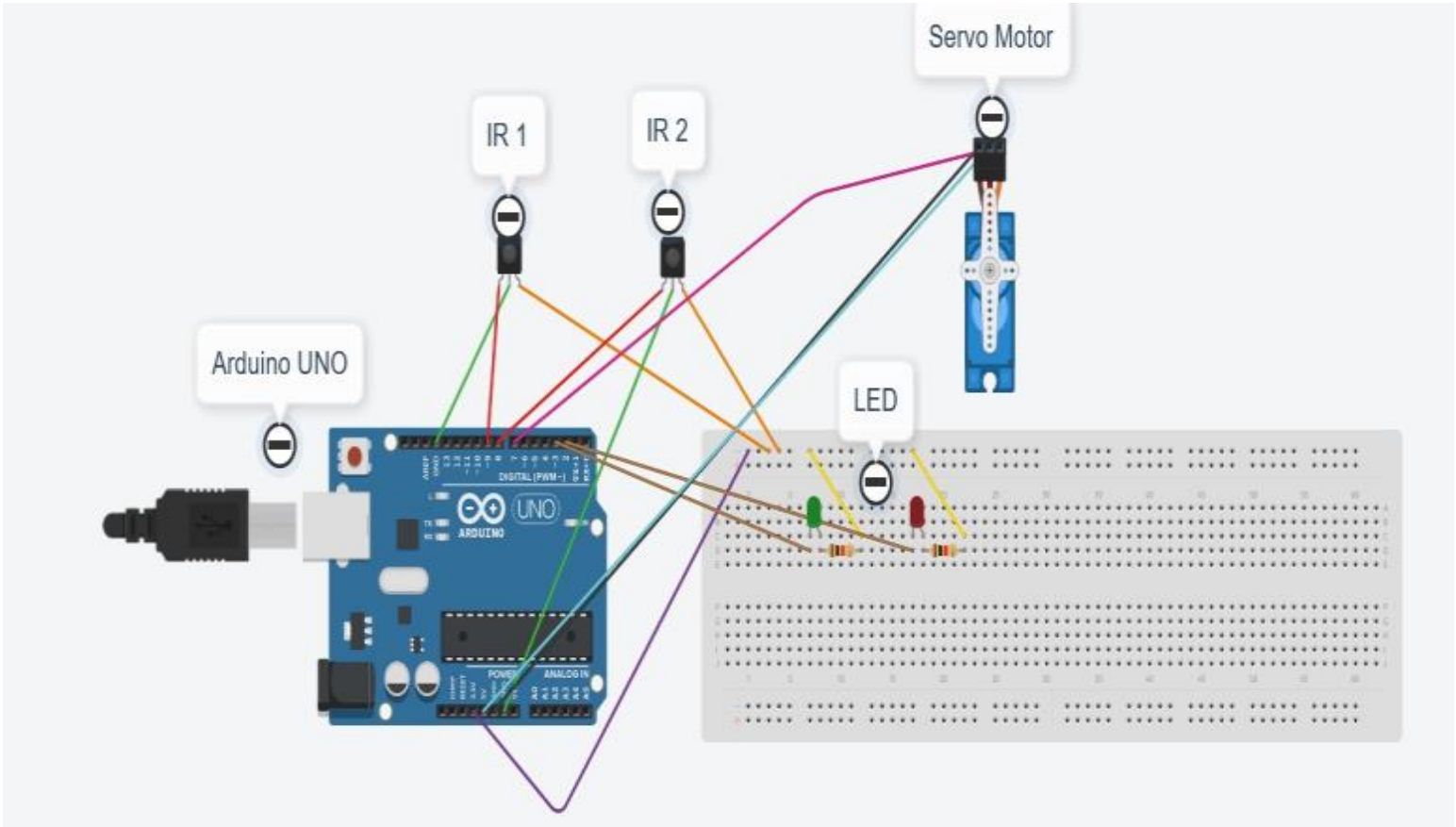


Fig 1: Architecture of of Module1

Implementation of Module2

```
#include<Servo.h>
int ir1 = 8;
int ir2 = 9;
int led=2;
int led1=3;
Servo motor;
void setup() {
pinMode(ir1,INPUT);
pinMode(ir2,INPUT);
motor.attach(7);
pinMode(led,OUTPUT);
pinMode(led1,OUTPUT);
}
```

```
void loop() {
if (digitalRead(ir1)==LOW)
{
 motor.write(10);
 digitalWrite(led,HIGH);
 digitalWrite(led1,LOW);

 }
else if(digitalRead(ir2)==LOW)
{
 motor.write(115);
 digitalWrite(led,LOW);
 digitalWrite(led1,HIGH);
}
}
```

Architecture

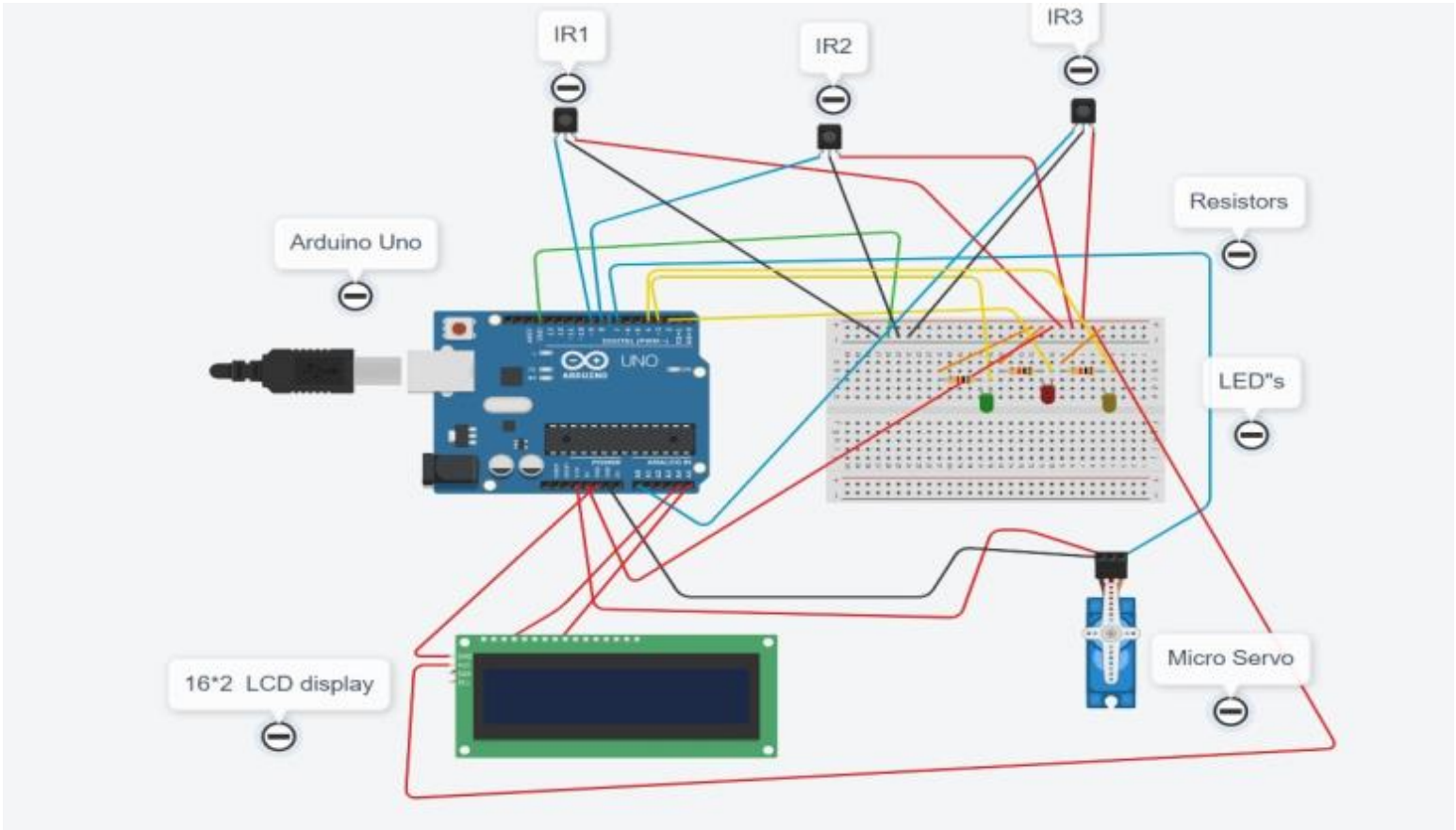


Fig 2: Architecture of Integration of Module1 and Module2

Implementation of Module2

```
LiquidCrystal_I2C lcd(0x27, 16, 2);
void setup()  {
 lcd.init(); // initialize the lcd
 lcd.init();
 lcd.backlight();
 lcd.setCursor(3,0);
 lcd.print("Count Down");
 pinMode(input,INPUT);
 pinMode(input1,INPUT);
 pinMode(input2,INPUT);
 motor.attach(7);
 pinMode(4,OUTPUT);
 pinMode(2,OUTPUT);
 pinMode(3,OUTPUT);   }
void loop()  {
 if (digitalRead(input) == LOW)  {
  digitalWrite(4,HIGH);
    digitalWrite(3,HIGH);
    digitalWrite(2,HIGH);
      int count;
```

```
for( count=20;count>=0;count--)
{
 digitalWrite(4,LOW);
 digitalWrite(3,HIGH);
 digitalWrite(2,HIGH);
 lcd.setCursor(3, 1);
  lcd.print("Time Left  ");
  lcd.setCursor(13, 1);
  lcd.print(count);
   delay(1000);
    lcd.clear();
    lcd.setCursor(3, 0);
  lcd.print("Count Down");
}
lcd.setCursor(5, 1);
lcd.print("Wait");
digitalWrite(2,HIGH);
digitalWrite(3,HIGH);
delay(12000);
digitalWrite(4,HIGH);
```

Architecture

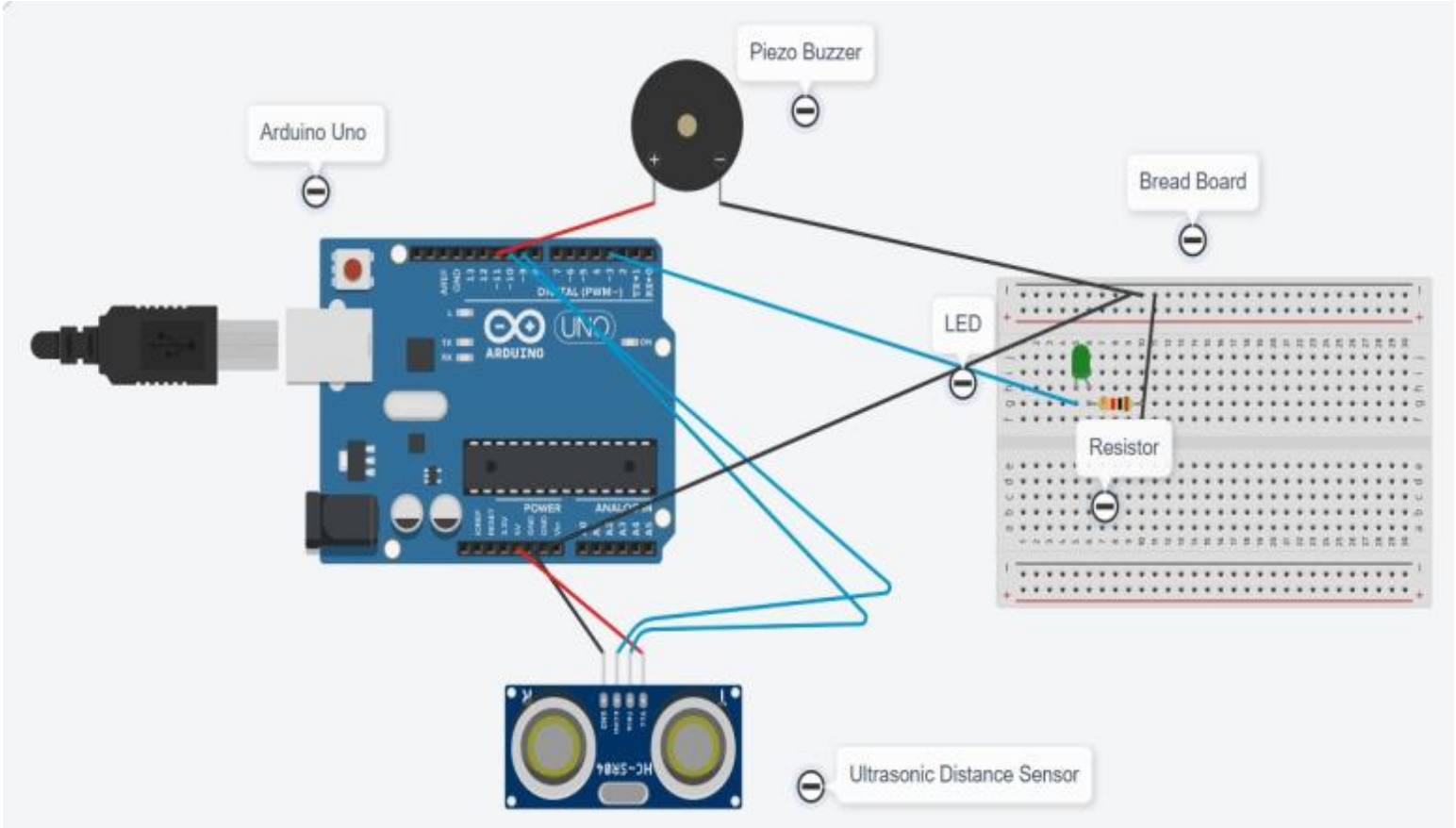


Fig 3: Architecture of Module3

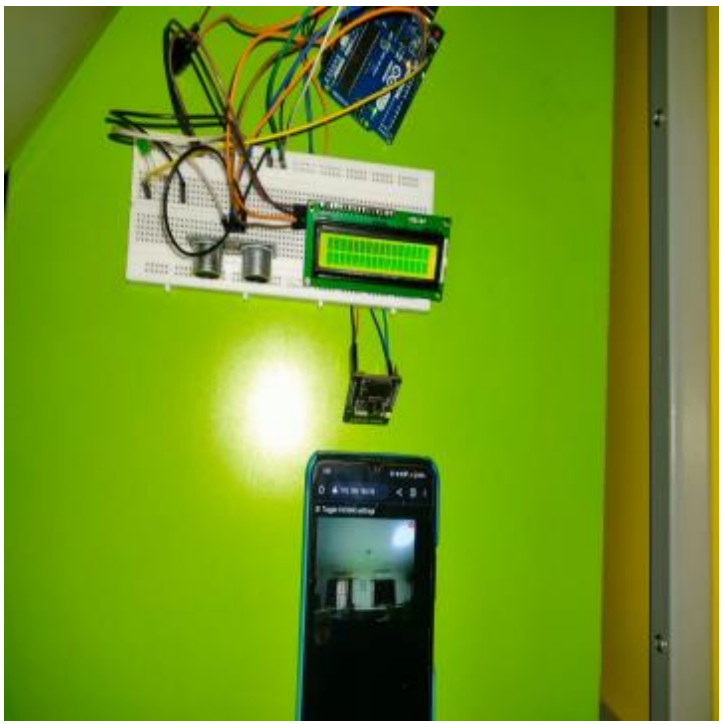
Implementation of Module3

```
safetyDistance = distance;
if (safetyDistance <= 100){
  digitalWrite(buzzer, HIGH);
  digitalWrite(ledPin, LOW);
lcd.clear();
}
else{
  digitalWrite(buzzer, LOW);
  digitalWrite(ledPin, HIGH);
  distance = 0;
  if(distance == 0){
    lcd.setCursor(0,0);
    lcd.print("NO OBSTACLE");
    delay(500);
    lcd.clear();

  }

}
```

Implementation of Module3



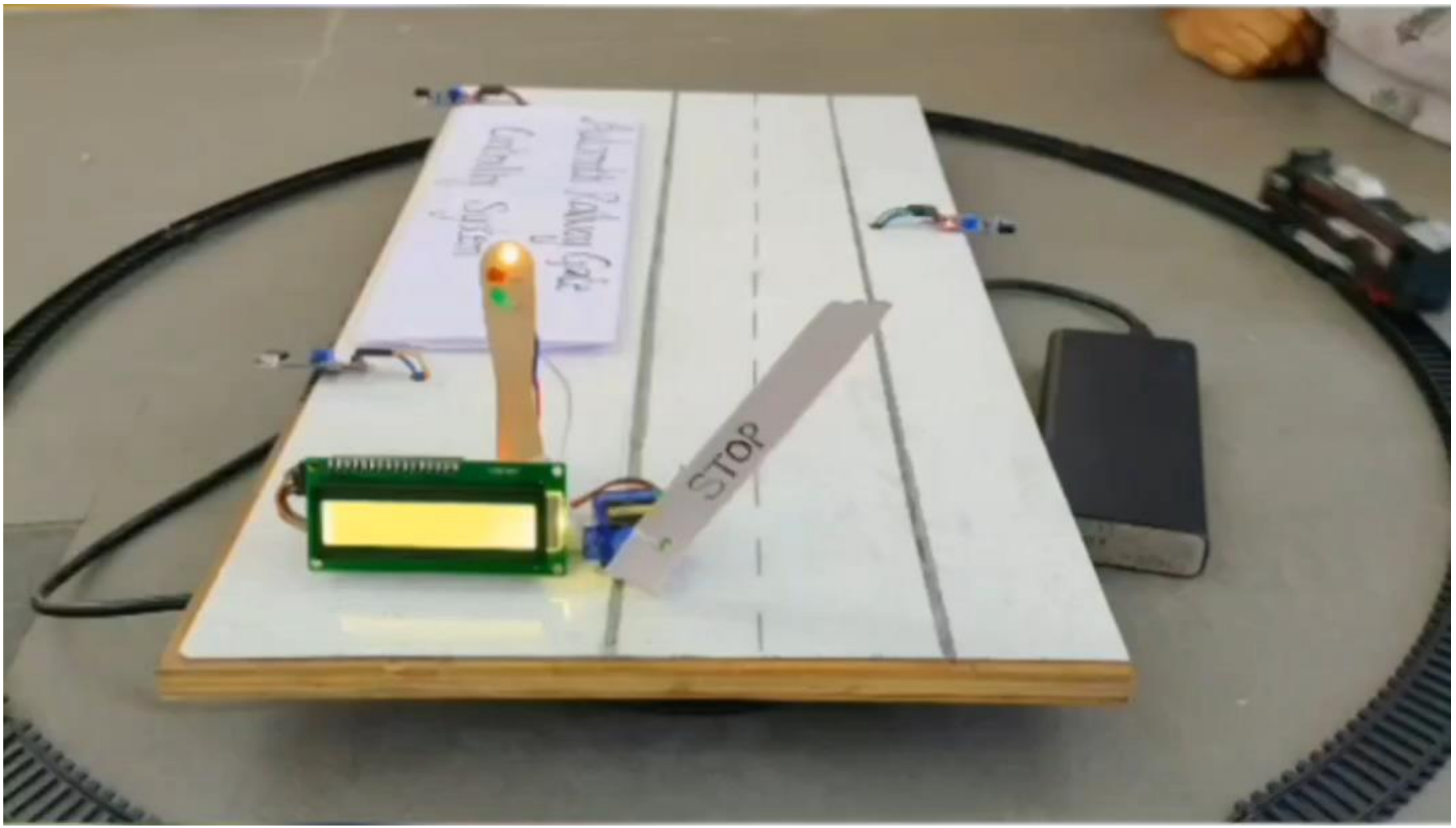
```
// Prints the distance on the Serial Monitor
if(distance > 0){
  lcd.setCursor(0,0);
lcd.print("OBJECT DETECTED");
lcd.setCursor(0,1);
  lcd.print(distance);
lcd.setCursor(3,1);
    lcd.print("cms");
    delay(1000);
  lcd.clear();

}



}
```

Execution Video



Results

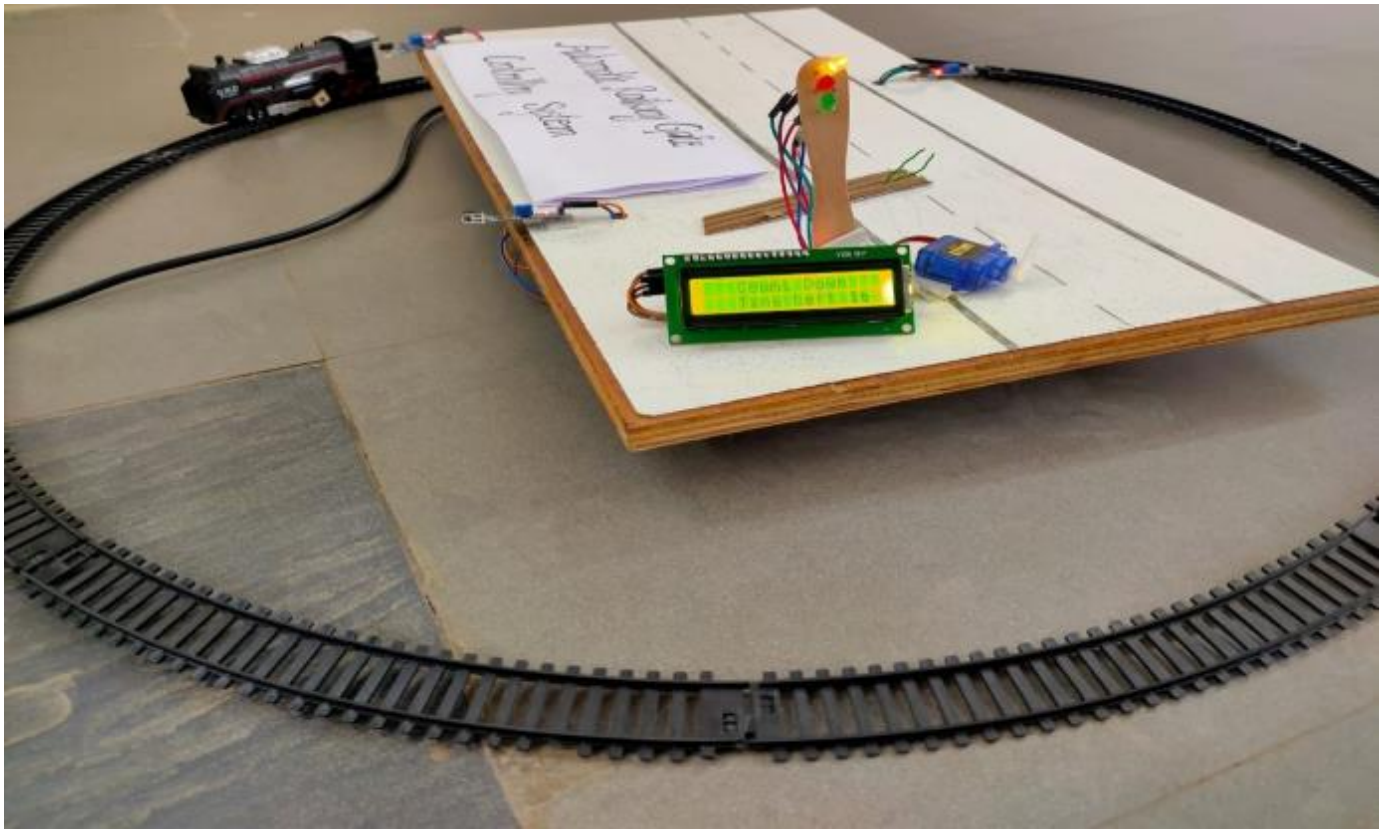


Fig 4: When train reaches 1st IR Sensor Count Down starts and Yellow Light is indicated.

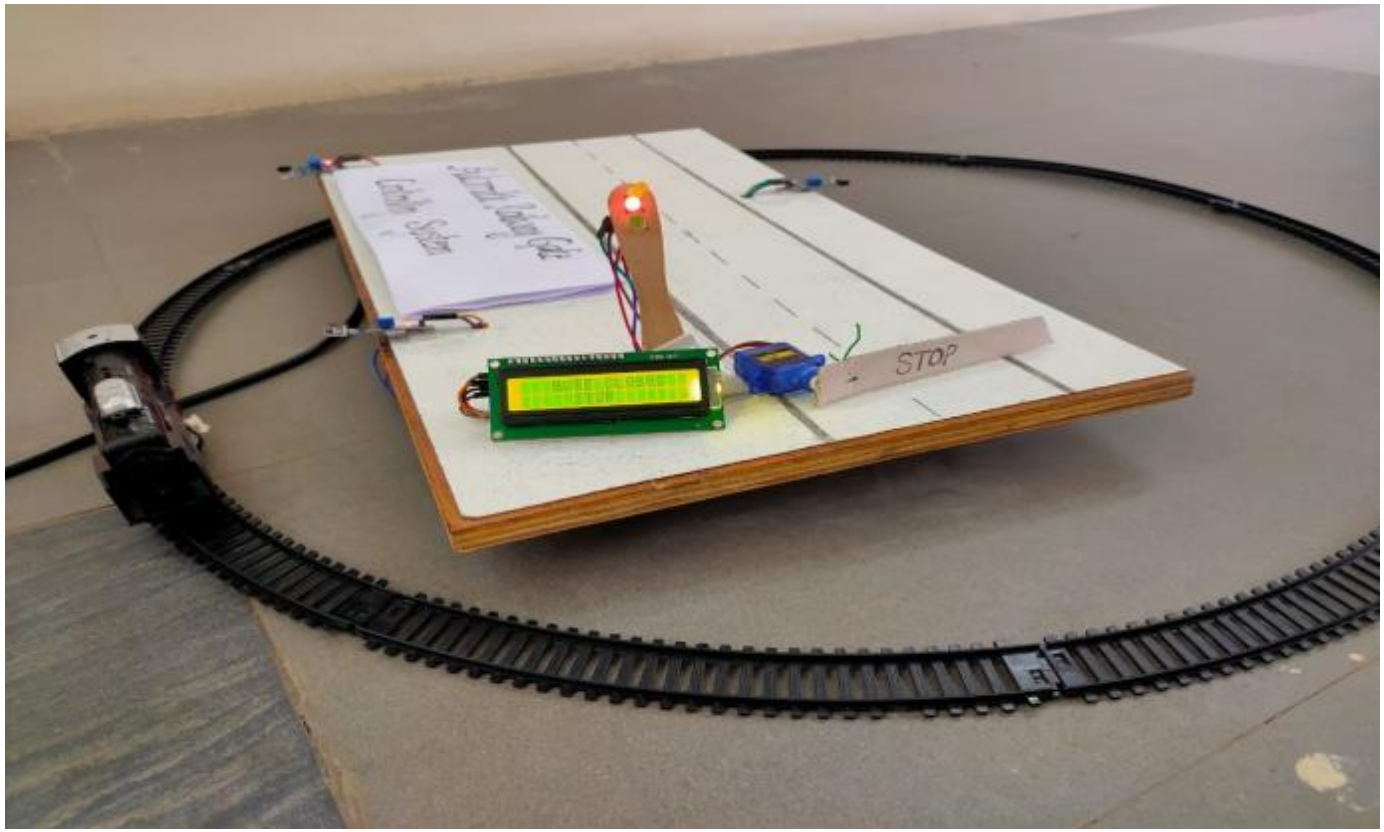


Fig 5: When train reaches 2st IR Sensor LCD displays STOP and Red Light is indicated.

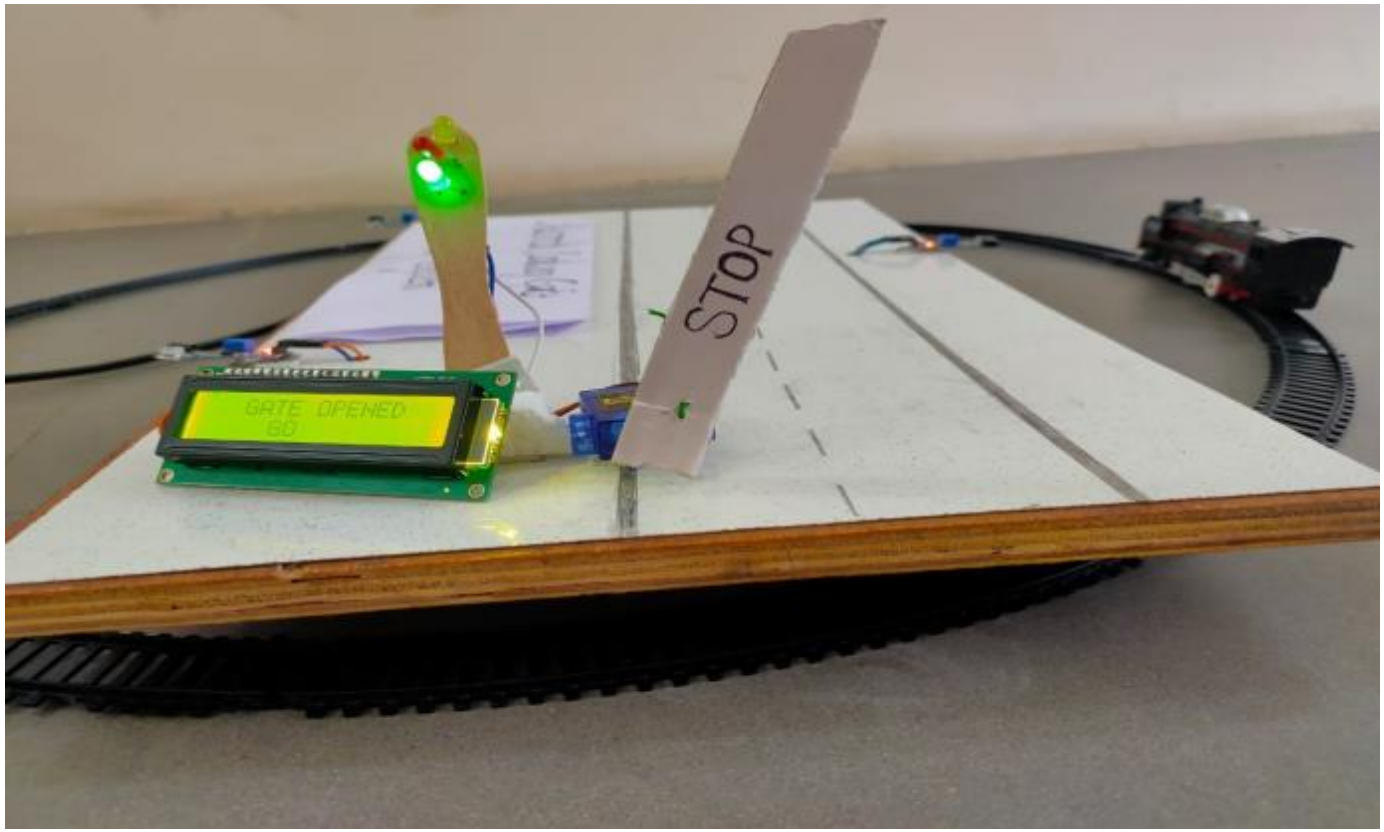


Fig 5: When train reaches 3rd IR Sensor LCD displays STOP and Green Light is indicated.

Conclusion & Future Scope

- The proposed system of Automatic Railway Gate Control System and obstacle detection is an effective way to reduce the occurrences of railway accidents. This system is effective for both the road users and the railway management.
- In extension to the project for further implementation adding a pair of Pressure sensor increases the chance of fault triggering of gate by the gate after receiving signals from both IR and Pressure sensor. Intimation of the obstacle detected on track to the next station master along with the GPS location of train for better service. departure of the train.

References

- Deva Rajan "Automatic Railway Gate Control System Using Arduino Controller"2021 COMNETSAT 2021 - Proc., vol. 2021-Janua, pp. 85-87, 2021.

- Al Ameen Nizamudeen,Syam Krishn KS,Jeffin John,Jasmine B,Mrs Anju " Automatic Railway Gate Control System " ,CS -International Journal of Emerging Technologies and Innovative Research(IJETIR), June 2021.

- Danijela Ristic-Durrant,Muhammad Abdul Haseeb,,"obstacle detection system for improvement of rail transport safety" ,Milan Banic-Institute of Mechanical Engineers(IME), June 2021.

References

- Saifuddin Mahmud, Ishtiaq Reza Emon, Md. Mohaimin Billah " Automated Railway Gate Controlling System " , -International Journal of Computer Trends and Technology(IJCTT), March 2020

- E. A. Reddy, I. Kavati, K. S. Rao and G. K. Kumar, "A secure railway crossing system using IoT", Proc. Int. Conf. Electron. Commun. Aerosp. Technol. ICECA 2020, vol. 2020-Janua, pp. 196-199, 2020.

- U. Zaman, S. Hossairr and C. Shahnaz, "Automatic Rail Crossing Alarming System", no. 5, pp. 129-132, 2019.

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