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Look Out: Laser Door Security System using Arduino with GSM Module

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ABSTRACT: Security is one of the most important necessity for ages. Guarding our own privacy and make sure the safety of near dear ones has been our culture. Human is a social being who has always participate to make for the betterment of society. To make sure the out places we inhabit is safe, we created this security system named 'Look Out(Laser Door Security System using Arduino with GSM Module)'. 'Look Out' is a very cheap device that can afford anyone. Main purpose of this device is to make sure your goods are safe.

KEYWORDS: Security System, Laser Based, Arduino, GSM Module, Message Sending

I. INTRODUCTION

In this project, we designed Laser Door Security system named 'Look Out' Using Arduino with GSM Module with the application of Laser Transmitter and Receiver. The project idea is related the security system using laser beam. Whenever any object will interrupt the Laser ray the alert message will be forward to users cellphone. This project can be implemented anywhere because, it is easy to build and cheap in cost, not only building or premises but many precious things like jewelry, diamonds, precious antique items in the museum, etc many other things are also secured using such a invisible Laser beam. We can secure our homes, offices, shops, warehouse, etc with Laser security system.

II. LITERATURE SURVEY

We have found different projects related to security system. Different security systems used for different purpose. Security system with alarm, Security system with motion sensor, Security system using wi-fi module, security system with bluetooth module, etc. This systems have range limits but we designed the system which has no range limits because we are using GSM Module, GSM has no range limits. It can reach anywhere that's why we decided to develop this project.

III. PROPOSED ALGORITHM

A. Components Required:

1) Hardware:

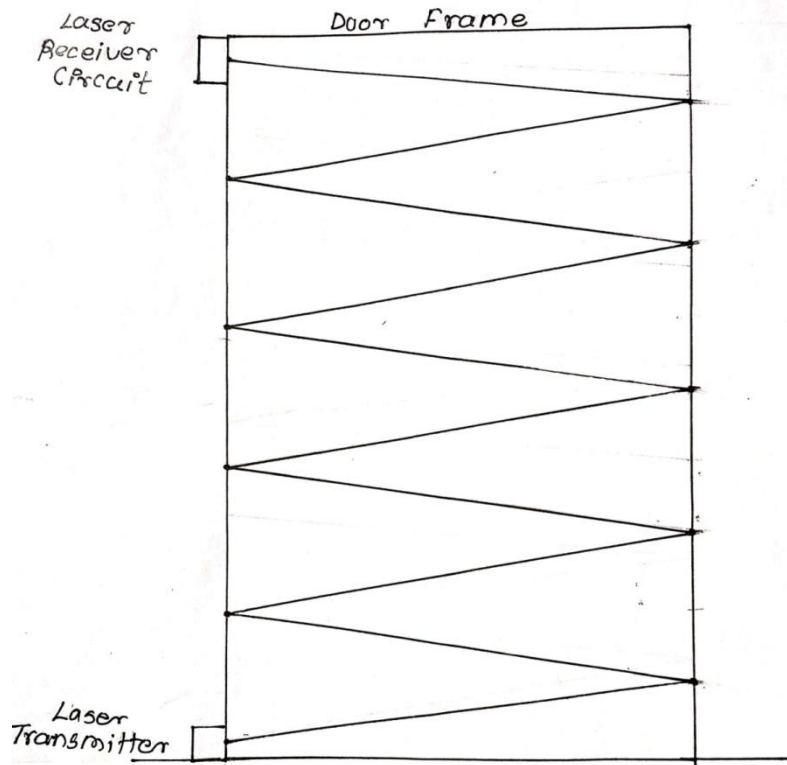
- i. Arduino UNO R3
- ii. Sim 800A GSM/GPRS Module
- iii. Laser Transmitter
- iv. Laser Receiver
- v. Jumping wires
- vi. 12v Adapter

2) Software:

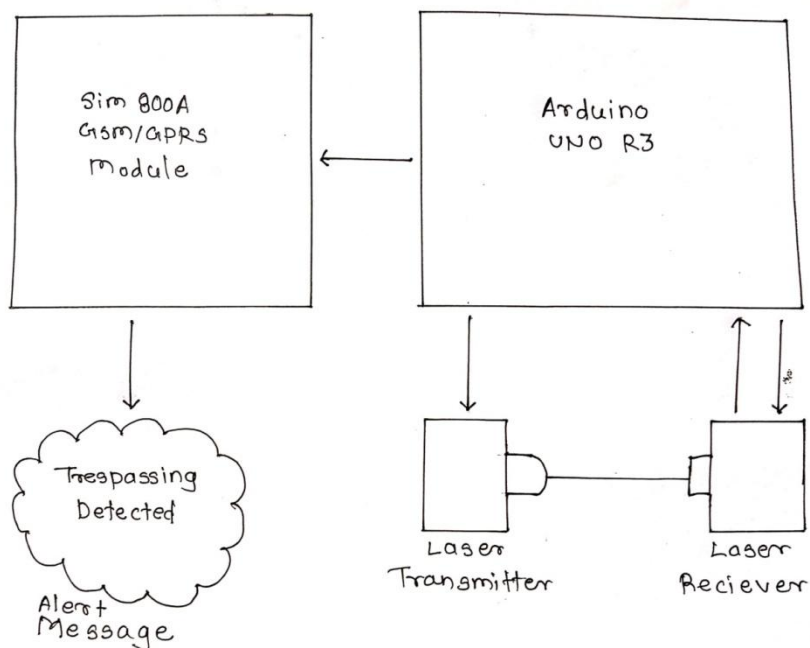
- i. Development Kit: Arduino IDE
- ii. Operating System: Windows 10

B. System Architecture:

i. System Application Diagram:



ii. Integration Architecture Diagram:



C. Pin Connections :

GSM Module		Arduino UNO
RXD	<--->	Digital Pin: -10
TXD	<--->	Digital Pin: -9
GND	<--->	GND

Laser Transmitter		Arduino UNO
S (VCC)	<--->	Power Pin: 3.3V
- (GND)	<--->	GND

Laser Receiver		Arduino UNO
DO (out)	<--->	Digital pin: 7
VCC	<--->	Power Pin: 5V
GND	<--->	GND

D. Arduino Code:

The code is written in C++ Programming Language

```
#include<SoftwareSerial.h>

SoftwareSerial mySerial(9,10);

void setup()
{
    mySerial.begin(9600);
    pinMode(7,INPUT);
    delay(2000);
}

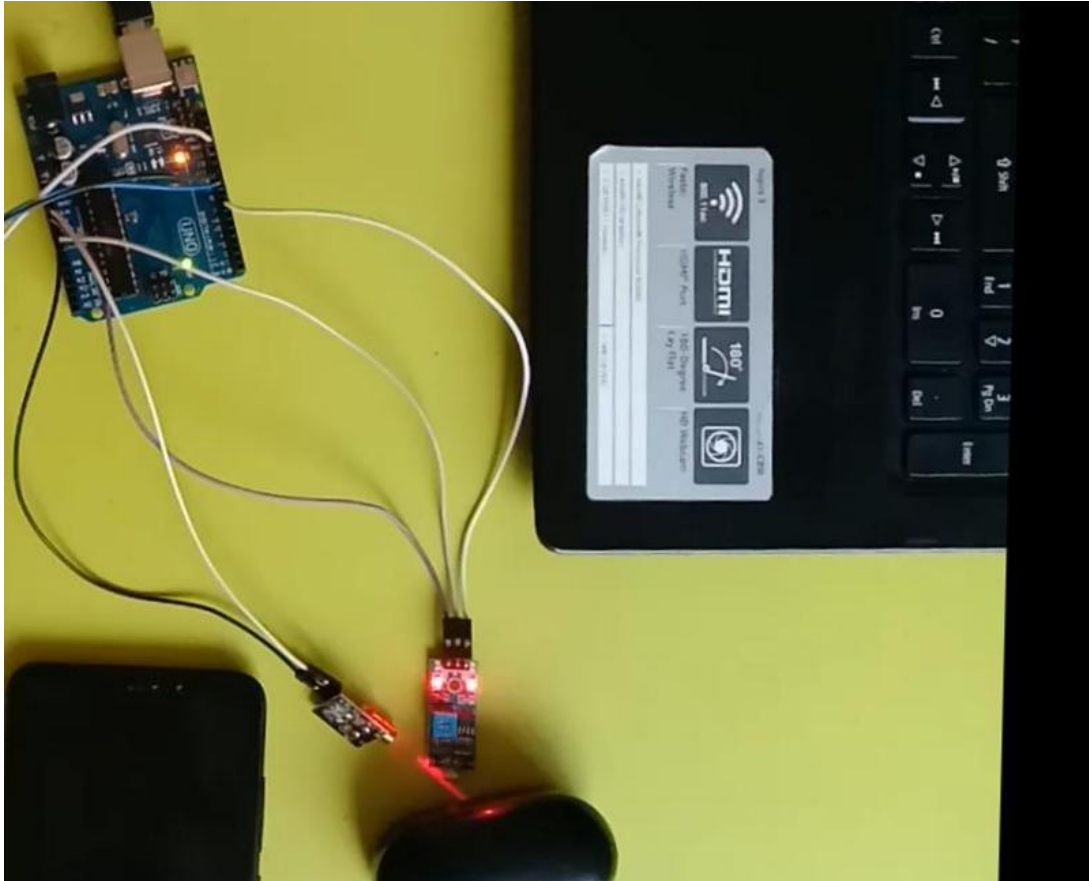
void loop()
{
    if(digitalRead(7)==HIGH)
    {
        sendSMS();
    }
}

void sendSMS()
{
    mySerial.print("AT+CMGF=1\r");
    delay(100);
    mySerial.println("AT+CMGS=\"+917387353404\"");
    delay(100);
    mySerial.println("TRESPASSING DETECTED");
    delay(100);
    mySerial.println((char)26);
    delay(100);
    mySerial.println();
    delay(5000);
}
```

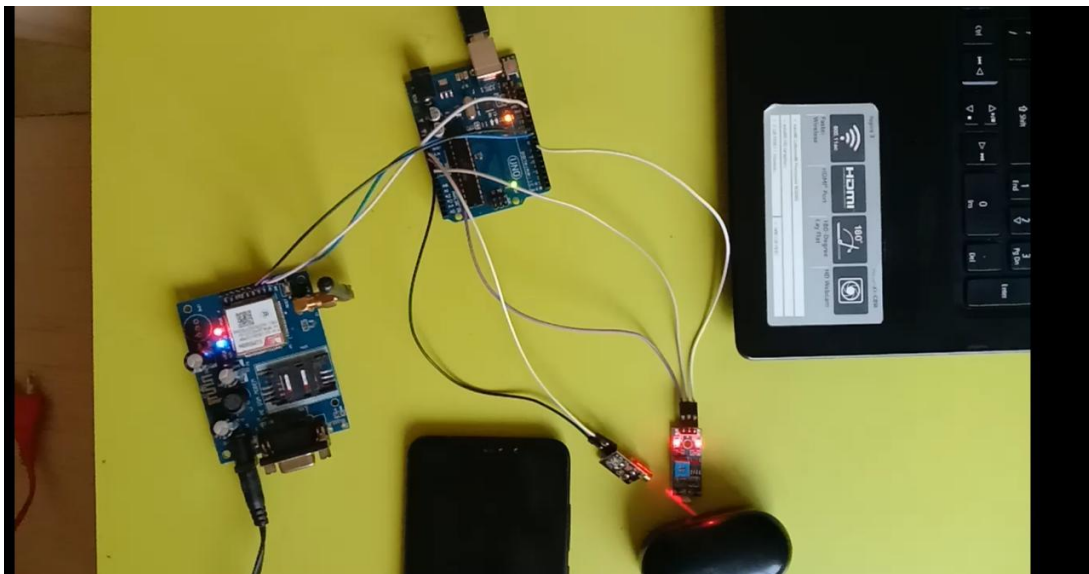

}

E. **Implementation:**

- i. First we connected the laser receiver and laser transmitter to Arduino.



- ii. After that we connected the GSM module with the laser receiver and transmitter to the Arduino.



- iii. Lastly we uploaded the code on the Arduino with the help of Arduino IDE

F. **Working:**

- i. 'Look Out' work as simple stimulus.
- ii. Laser will be transmitting on the mirrors which will be pointing to laser receiver.
- iii. Laser will be received by receiver so the circuit will be complete.
- iv. If any object or a person interrupt the path of laser beam the circuit will break.
- v. Immediate alert message will be forwarded to the users cellphone.
- vi. Alert message will keep sending until the circuit is complete again.

G. **Advantages:**

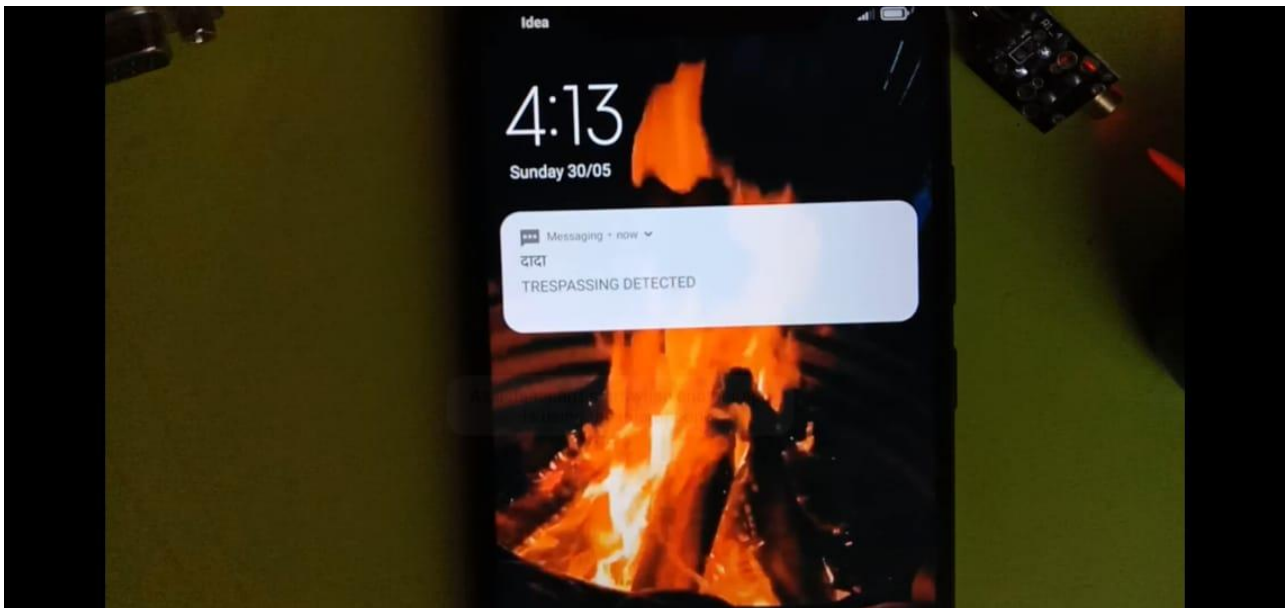
- i. User could customize the work area as per need.
- ii. This security system does not need any kind of maintenance.
- iii. Costing is low comparative to any other security devices.

H. **Disadvantages:**

- i. There should be proper network connection.
- ii. If used in household pets could trigger the mechanism.

IV. SIMULATION RESULTS

When the object is destructed the Laser ray the alert message 'TRESPASSING DETECTED' is sent on users cellphone.



V. CONCLUSION AND FUTURE WORK

This simulation result shows that the message is successfully sent on users cellphone when the laser beam get interrupted by any object. In this project, we used laser on a door but in future we can use it on any place and we can add a camera module, as the extra module will added the complexity of code will increase.

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