

NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

(AFFILIATED TO VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM, APPROVED BY AICTE & GOVT.OF KARNATAKA)



MINI PROJECT REPORT

ON

Smart Home Security System

Submitted by:

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INT16CS192

Submitted in partial fulfillment of the requirement for the award of Degree of BACHELOR OF ENGINEERING

Under the Guidance of

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Signature

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CERTIFICATE

This is to certify that the Mini Project Report
Smart Home Security System

Is an authentic work carried out by

1. *Bivek Kumar Shah*

1NT16CS192

In partial fulfillment of the requirements for the completion of Mini Project for the academic year 2017-2018.

Ms Shobha P (Guide)

Dr. Thippeswamy MN(HOD)

Name & Signature of the Examiner

ACKNOWLEDGEMENT

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals. I would like to extend my sincere thanks to all of them.

I would like to express my special gratitude and thanks to our HOD **Dr. Thippeswamy MN** for giving us freedom to do mini-project in the programming language of our choice and also for letting us choose the cs related topic of our choice for the miniproject.

I am highly indebted to my guide **Ms. Shobha P** and some teachers for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project.

I would like to express my gratitude towards my parents for their kind co-operation and encouragement which help me in completion of this project.

My thanks and appreciations also go to my friends/Seniors in developing the project and people who have willingly helped me out with their abilities.

ABSTRACT

The project presents a versatile security and alarm system which falls under IoT (Internet Of Things) which can be used by individuals, corporations to get a immediate Intruder alert and take the necessary action / protection from the Intruder before its too late.

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1.INTRODUCTION

The home is place where we want to feel secure but there are some chances when a burglar can attempt to enter our house without our knowledge and can harm us.

To prevent the above scenario, the smart home security system plays a vital role as it alert us within a second when a intruder tries to break into the house so that we can take necessary action and keep ourselves and our belongings safe from them.

The home security system uses a Micro-controller, sensors, keypad for input and lcd display as output for the user interaction and monitoring device to provide the live feed to the user to monitor the intruder steps.

2. SYSTEM ANALYSIS

The way that is followed while developing this project is as follow:

2.1 Existing System

In the existing system there are ordinary webcam that is fixed on the certain area on the certain angle for the monitoring and also the existing don't use sensor much in their security.

2.2 Purpose System

In the purposed system various sensors are used for maintaining the maximum security and a pin-lock system for activating and deactivating the system in various and as well as the moitoring device unlike the old security system this camera can rotate the violated area in a second.

2.2.1 Scope

- i. The user can enable / disable the security system with the password.
- ii. The burglar alarm is activated whenever a intruder violates any part of house.
- iii. The user will get the information about which area of the house is being violated.
- iv. The user can monitor the different violated area's from a monitoring device from a single place.

2.2.2 Aim of the Project

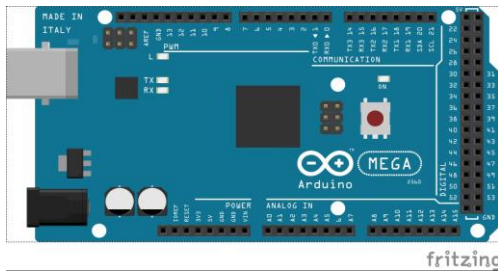
The aim of this project is to create security system that is smarter than other traditional security system and user friendly.

3.Requirement Specifications

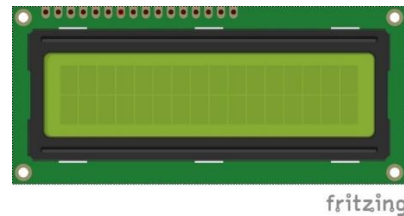
3.1 Software

Software used to the program the micro-controller is “Arduino Ide 1.8.5” which was downloaded from <https://www.arduino.cc/en/Main/Software> and ran in Windows and Fritzing software to develop the circuit diagram sketches (www.fritzing.com/downloads)

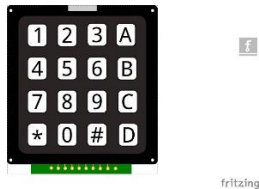
3.2 Hardwares



3.2.1. Arduino Mega 2560



3.2.2. 16x2 Lcd



3.2.3 4x4 keypad

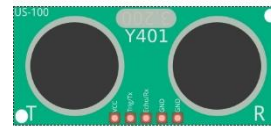


3.2.4. Pir Sensor(x5).



fritzing

3.2.5.Servo Motor(x2).



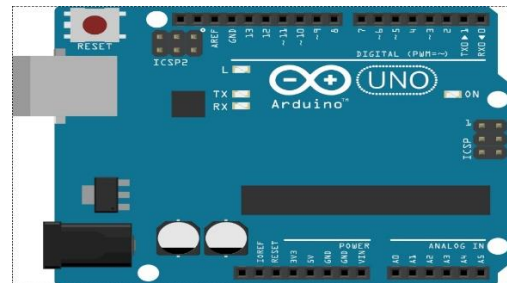
fritzing

3.2.6.Ultra Sonic Range Finder.



fritzing

3.2.7.LED (x2).

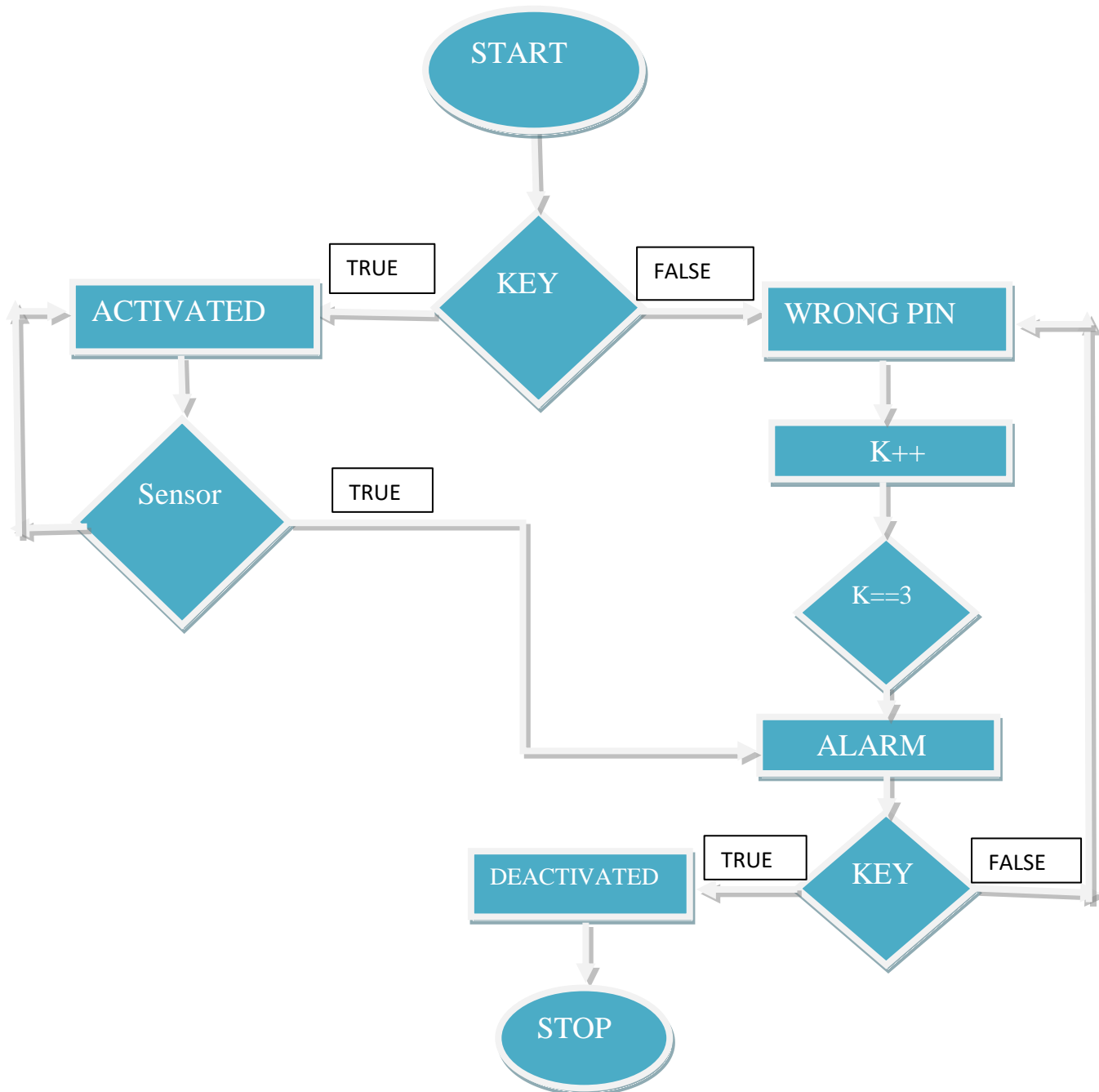


fritzing

3.2.8.Arduino Uno R3

4.System Design

4.1 Flowchart



5.SYSTEM IMPLEMENTATION

The system is implemented with the embedded C codes that were written to the microcontroller.

5.1 CODES

```
#include <LiquidCrystal.h>
```

```
#include <Keypad.h>
```

```
#include <Password.h>
```

```
#include <Servo.h>
```

```
Servo Servo1;
```

```
Servo Servo2;
```

```
int active = 0;
```

```
int passwd_pos = 7;
```

```
int k = 0;
```

```
int val1 = 0;
```

```
int val2 = 0;
```

```
int val3 = 0;
```

```
int val4 = 0;
```

```
int val5 = 0;

int servoPin1 = 28;

int servoPin2 = 29;

Password password = Password("1234");

LiquidCrystal lcd(22, 23, 24, 25, 26, 27);

const int pir1 = A4;

const int pir2 = A5;

const int pir3 = A6;

const int pir4 = A15;

const int pir5 = A10;

const int trigPin = A0;

const int echoPin = A1;

const int gled = A3;

const int yled = A2;

const int buzz = 5;

int i = 0;

//for_keypad

const byte ROWS = 4;

const byte COLS = 4;

char keys[ROWS][COLS] = {

    {'1', '2', '3', 'A'},
```

```
{'4', '5', '6', 'B'},  
  
{'7', '8', '9', 'C'},  
  
{ '*', '0', '#', 'D' }  
  
};  
  
byte rowPins[ROWS] = {6, 7, 8, 9};  
  
byte colPins[COLS] = {10, 11, 12, 13};  
  
Keypad keypad = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS );  
  
void setup() {  
  
    lcd.begin(16, 2);  
  
    Serial.begin (9600);  
  
    pinMode(pir1, INPUT);  
  
    pinMode(pir2, INPUT);  
  
    pinMode(pir3, INPUT);  
  
    pinMode(pir4, INPUT);  
  
    pinMode(pir5, INPUT);  
  
    pinMode(trigPin, OUTPUT);  
  
    pinMode(echoPin, INPUT);  
  
    pinMode(buzz, OUTPUT);  
  
    pinMode(gled, OUTPUT);  
  
    pinMode(yled, OUTPUT);  
  
    keypad.addEventListener(keypadEvent);
```

```
lcd.setCursor(0, 0);  
  
lcd.print("Security system");  
  
lcd.setCursor(0, 1);  
  
lcd.print("Miniproject");  
  
delay(1600);  
  
lcd.clear();  
  
lcd.setCursor(0, 0);  
  
lcd.print("Created by");  
  
lcd.setCursor(0, 1);  
  
lcd.print("BIVEK SHAH");  
  
delay(2000);  
  
lcd.clear();  
  
lcd.setCursor(0, 0);  
  
lcd.print("UNDER GUIDANCE");  
  
lcd.setCursor(0, 1);  
  
lcd.print("MS.SHOBHA P");  
  
delay(2000);  
  
lcd.clear();  
  
lcd.setCursor(0, 0);  
  
lcd.print("Enter Code");  
  
Servo1.attach(servoPin1);
```

```
Servo2.attach(servoPin2);

}

void loop()

{ keypad.getKey();

  if (active == 1)

  {

    ultra();

    //pir();

  }

}

void keypadEvent(KeypadEvent eKey) {

  switch (keypad.getState()) {

    case PRESSED:

      lcd.setCursor((passwd_pos++), 1);

      switch (eKey) {

        case '#':

          passwd_pos = 7;

          buzz1();

          checkPassword();

          break;
```



```
case '*':  
  
    password.reset();  
  
    buzz1();  
  
    lcd.setCursor(0, 1);  
  
    lcd.print("      ");  
  
    passwd_pos = 7;  
  
    break;  
  
default:  
  
    password.append(eKey);  
  
    lcd.print("*");  
  
    buzz1();  
  
    }  
  
    }  
  
    }
```

```
void checkPassword() {  
  
    if (password.evaluate()) {  
  
        Activated();  
  
        password.reset();  
  
        k = 0;  
  
    }  
  
}
```

```
else

{

    wrongpin();

}

}

void Activated()

{

    active = 1;

    i++;

    lcd.setCursor(0, 0);

    lcd.clear();

    lcd.print("SECURITY ACTIVE");


    digitalWrite(yled, HIGH);

    digitalWrite(gled , LOW);

    if (i % 2 == 0)

    {

        deactivated();

    }

}
```

```
    return;

}

void deactivated()

{

    active = 0;

    lcd.setCursor(0, 1);

    lcd.clear();

    lcd.setCursor(0, 0);

    password.reset();


    lcd.clear();

    lcd.print("DEACTIVATED");

    digitalWrite(yled, LOW);

    digitalWrite(gled, HIGH);

    exit;

}

void wrongpin()

{

    lcd.clear();

    lcd.setCursor(4, 0);

    lcd.print("WRONG PIN");
```

```
password.reset();

k++;

if (k >= 3)

{

    lcd.clear();

    lcd.setCursor(5, 0);

    lcd.print("INTRUDER");

    alarm();

    k = 0;

}

}

void buzz1()

{

    digitalWrite(buzz, HIGH);

    delay(50);

    digitalWrite(buzz, LOW);

}

//sensors

void ultra()

{
```

```
float duration, distance;

digitalWrite(trigPin, LOW);

delayMicroseconds(2);


digitalWrite(trigPin, HIGH);

delayMicroseconds(10);

digitalWrite(trigPin, LOW);


duration = pulseIn(echoPin, HIGH);

distance = (duration / 2) * 0.0344;

val1 = digitalRead(pir1);

val2 = digitalRead(pir2);

val3 = digitalRead(pir3);

val4 = digitalRead(pir4);

val5 = digitalRead(pir5);

if (distance <= 25)

{ Serial.println("ultra");

Servo1.write(120);

  Servo2.write(170);

  lcd.clear();

  lcd.setCursor(0, 0);
```

```
lcd.print("MOTION IN");

lcd.setCursor(0, 1);

lcd.print("BACKYARD");

alarm();

}

else if (val1 == HIGH)

{ Serial.println("pir1");

  Servo1.write(120);

  Servo2.write(50);

  lcd.clear();

  lcd.setCursor(0, 0);

  lcd.print("MOTION IN");

  lcd.setCursor(0, 1);

  lcd.print("ROOM 3");

  alarm();

  val1 = LOW;

}

else if (val2 == HIGH)

{ Serial.println("pir2");

  Servo1.write(110);
```

```
Servo2.write(30);

lcd.clear();

lcd.setCursor(0, 0);

lcd.print("MOTION IN");

lcd.setCursor(0, 1);

lcd.print("ROOM 1");

alarm();

val2 = LOW;

} else if (val3 == HIGH)

{ Serial.println("pir3");

Servo1.write(100);

Servo2.write(60);

lcd.clear();

lcd.setCursor(0, 0);

lcd.print("MOTION IN");

lcd.setCursor(0, 1);

lcd.print("ROOM 2");

alarm();

val3 = LOW;

} else if (val4 == HIGH)

{ Serial.println("pir4");
```

```
Servo1.write(110);  
  
Servo2.write(0);  
  
lcd.clear();  
  
lcd.setCursor(0, 0);  
  
lcd.print("MOTION IN");  
  
lcd.setCursor(0, 1);  
  
lcd.print("GARAGE");  
  
alarm();  
  
val4 = LOW;  
  
} else if (val5 == HIGH)  
{ Serial.println(val5);  
  
Servo1.write(110);  
  
Servo2.write(80);  
  
lcd.clear();  
  
lcd.setCursor(0, 0);  
  
lcd.print("MOTION IN");  
  
lcd.setCursor(0, 1);  
  
lcd.print("ROOM 4");  
  
alarm();  
  
val5 = LOW;  
  
}
```



```
    else return;

}

void alarm()

{

    while (!password.evaluate())

    {

        digitalWrite(buzz, HIGH);

        delay(50);

        digitalWrite(buzz, LOW);

        delay(50);

        Serial.println("AT alarm");

        /* if(active==1)

        { Serial.println("in ultra function");

        ultra();

        }*/

        Serial.println("AT key");

        keypad.getKey();

    }

    Serial.println("deactivated");

    deactivated();
```

```
Servo1.write(50);
```

```
Servo2.write(20);
```

```
i++;
```

```
}
```

6. RESULT

The result of this project gave the quick intruder alert whenever the sensor was voided in part any part of the house with lcd display and monitoring device.



Fig no 6.1

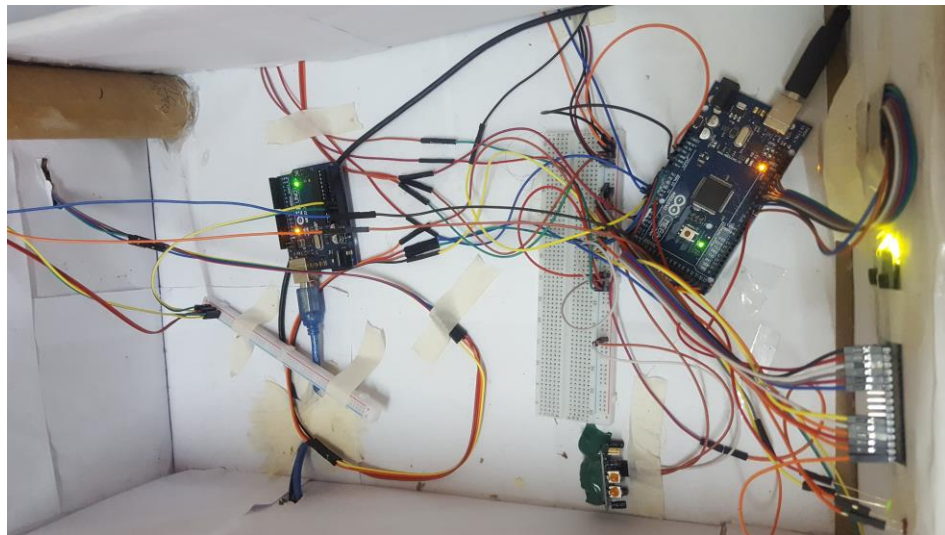


Fig no 6.2

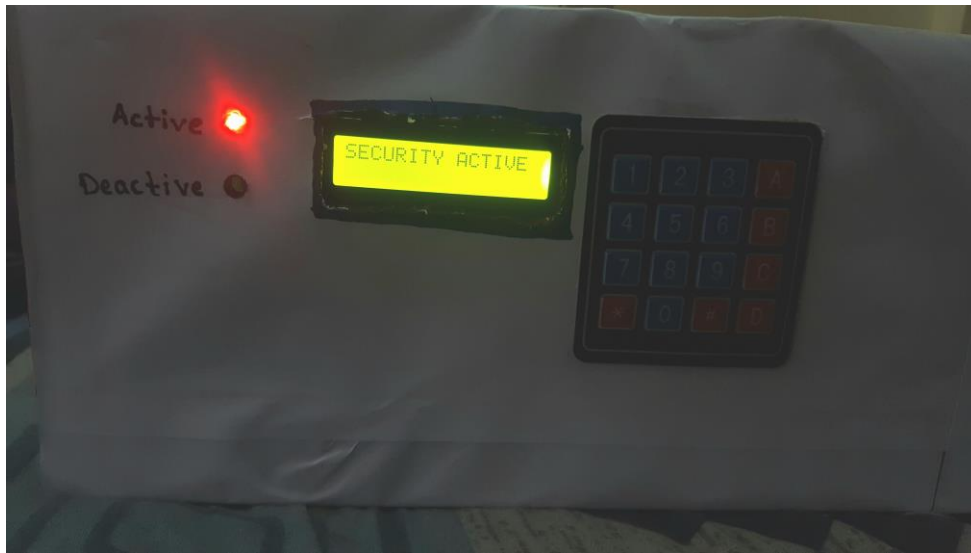


Fig no 6.3



Fig no 6.4

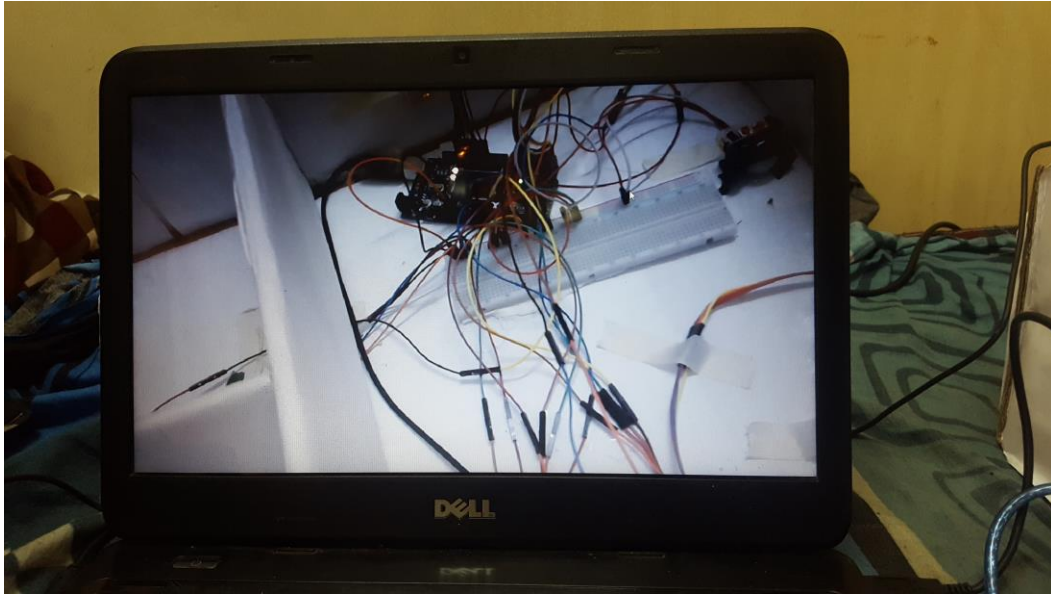


Fig no 6.5

7. Conclusion

After the experiment of the project it was observed that is more secure than the other traditional security system and alert given by the system to the user when anyone tried to enter the house was much faster than other security system.

8. Reference

- [1]. ArduinoProject Hub[Online] available at
<https://create.arduino.cc/projecthub/projects/tags/security>
- [2]. Use of sensor [Online] Available <https://github.com/practicalarduino/SecuritySensor>
- [3]. By James W. Grenning “Test Driven Development for Embedded C “ 3rd Edition
2011.