

Home Security Using LDR, Temperature Sensor & PIR Sensor

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ABSTRACT: Home Security is always a concern due to the soaring intrusion attacks in the house. In our project we are trying to alert the owner if there is an intrusion attack that is about to happen using different sensors. Components used in the proposed system are Arduino uno, PIR sensor, Temperature sensor (TM36), LDR Sensor, Potentiometer, Resistors, LED's, LCD Display.

Some of the components that are used are discussed below. The system is designed with the mindset that it should be cheap as well as secure, while fulfilling the task at hand

We aim to find a cheap and reliable way to make homes safer at a lower cost with maximum security.

KEYWORDS: IoE, Detect, Temperature, Motion, Sensors, Arduino Uno, LDR.

I. INTRODUCTION

Our system works on the basis of detecting any awareness be it heat, movement or change in light. We have used Arduino uno to integrate all these systems together, and system display to show if the sensors have captured any data or intrusion.

1. Arduino Uno Board

It is an IOT tool which is very much useful when interfacing with the electronic components and coding which would be too hard if we would have to code the components individually by using the machine level code. Arduino provides the software tool which helps us to code the components using embedded C. The tool is the Arduino IDE and it is an open-source software provided by the Arduino. It uses the ATmega328P microcontroller. It consists of a set of Digital and Analog pins. It can be operated in two voltages i.e., the 3.3v and 5v as some of the components don't require high voltage as it can damage the components. So, the components required to build the Fingerprint scanner lock have been studied and now we proceed toward combining the system.

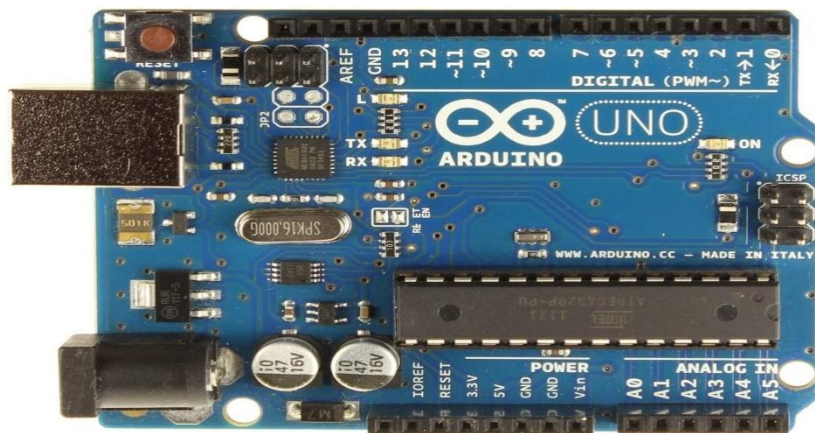


Fig.1 Arduino Uno Board

2. LCD Screen

The Hitachi-compatible LCDs can be controlled in two modes: 4-bit or 8-bit. The 4-bit mode requires seven I/O pins from the Arduino, while the 8-bit mode requires 11 pins. For displaying text on the screen, you can do most everything in 4-bit mode, so example shows how to control a 16x2 LCD in 4-bit mode.

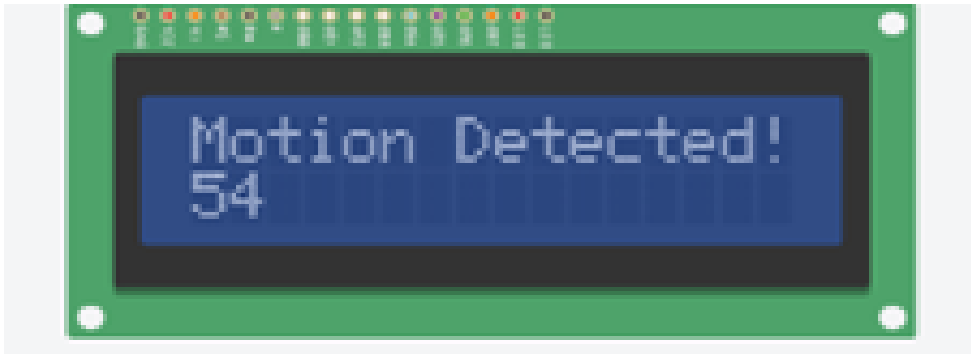


fig.2 LCD Screen

3. LM-35 Temperature Sensor

LM35 is a temperature measuring device having an analog output voltage proportional to the temperature. It provides output voltage in Centigrade (Celsius). It does not require any external calibration circuitry. The sensitivity of LM35 is 10 mV/degree Celsius.

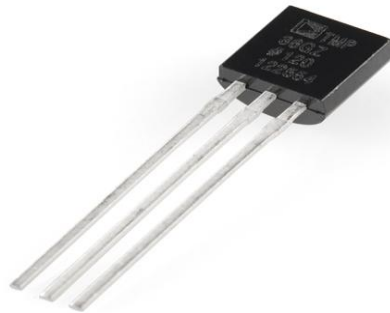


Fig.3 LM35 Temperature Sensor

4. Wires

These are Jumper wire male to female, used in connecting female header pin of any development board (like Arduino) to other development board having male connector. We have also used some male-to-male connectors.



Fig.4 Wires

5. LED

In electronics, an LED circuit or LED driver is an electrical circuit used to power a light-emitting diode (LED). The circuit must provide sufficient current to light the LED at the required brightness, but must limit the current to prevent damaging the LED.



Fig. 5 LED

6. Photoresistor

A photoresistor (also known as a light-dependent resistor, LDR, or photo-conductive cell) is a passive component that decreases resistance with respect to receiving luminosity (light) on the component's sensitive surface.



Fig.6 Photoresistor

7. PIR Sensor

The PIR sensor itself has two slots in it, each slot is made of a special material that is sensitive to IR. The lens used here is not really doing much and so we see that the two slots can 'see' out past some distance (basically the sensitivity of the sensor).



Fig.7 PIR Sensor

8. Tinkercad

Tinkercad is a free, online 3D modeling program that runs in a web browser, known for its simplicity and ease of use.[1] Since it became available in 2011 it has become a popular platform for creating models for 3D printing as well as an entry-level introduction to constructive solid geometry.

II. DETECTION TECHNIQUES

1. Motion Based Sensor

It researches the characteristics, (for instance, edges, flows, etc....) of the object of excitement for an image, to compare some indisputable features around that previous image. For the most part, methodologies applied to checking cone of vision predominantly both current image and previous image. Regardless of the way sensor is sensitive to changes. The face image of the cone of view is most likely going to be impacted by the outside circumstances because of distinctive weather conditions.

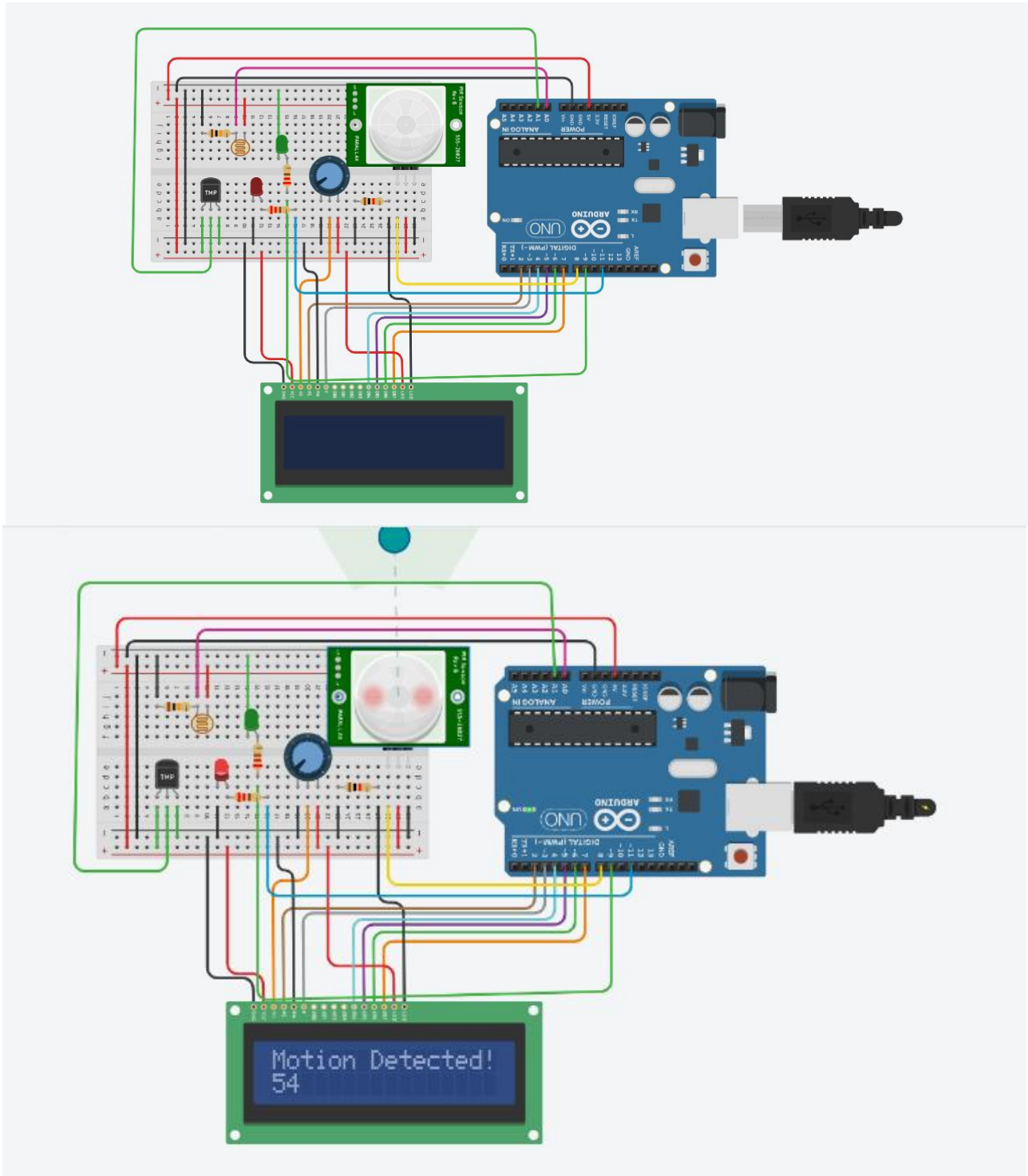
2. Temperature Sensor

Since human have a higher core body temperature & so do animals it becomes easier to keep track of change in temperature for the sensor, once the sensor picks up change it detects the change and alerts the users through LED's making it prominent that there could be a foreign object present in the surrounding.

3. LDR (Light Dependent Resistor)

A LDR (Light Dependent resistor) or photoresistor is a type of resistor that is capable of picking change in light and change its operation based on the input, similarly we have used the LDR to inform the user if it detects change in light. This information is relayed to the user through LED's.

III. THE PROPOSED SYSTEM



```

1 // library for the LCD display:
2 #include <LiquidCrystal.h>
3
4 int hot=9;
5 float sensor=0;
6 float celsius=0;
7 float voltage=0;
8 //The above is for temperature sensor
9 int ledPin = 11;
10 int PIRpin = 8;
11 int pirState = LOW;
12 int val = 0;
13 // photocell circuit
14 int photocellPin = 0; // the cell and 10K pulldown are connecte
15 int photocellReading; // the analog reading from the sensor c
16
17 LiquidCrystal lcd(2, 3, 4, 5, 6, 7);
18
19
20 void setup() {
21
22     pinMode(ledPin, OUTPUT);
23     pinMode(PIRpin, INPUT);
24     pinMode(photocellPin, INPUT);
25     pinMode(hot, OUTPUT);
26
27     Serial.begin(9600);
28     lcd.begin(16, 2);
29     lcd.setCursor(2, 0); // Set LCD cursor pos
30     lcd.print("P.I.R Motion "); // Print text to LCD
31     lcd.setCursor(0, 1); // Set LCD cursor pos
32     lcd.print("and Light Sensors"); // Print text to LCD
33     delay(2000); // wait 2s // Delay to read text
34
35     delay(2000); // Delay to read text
36

```

IV. CONCLUSION

This paper proposes a system for intruder revelation for security by proposing some sensible methods for integrating multiple sensors to make this process more precise and cost efficient in the wellsprings of data taken by the structure, we can use this data to improve on the current system as well as make newer and better models. This paper improves the methods like intrusion detection based on just one factor. In any case, the system gets intruders data using sensors with immaculate precision. It triggers the alert if it picks up change in sensors, these alerts could be made through many different devices or systems.

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