AI based House Security Model

A MINI PROJECT REPORT

18CSC305J - ARTIFICIAL INTELLIGENCE

Submitted by

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BONAFIDE CERTIFICATE

Certified that Mini project report titled **"AI based House Security Model"** is the bonafide work of **Saurabh Pandey(RA2011003010207), Naimish Pandey(RA2011003010147) & Aakash Chaudhary(RA2011003010159)** who carried out the minor project under my supervision. Certified further, that to the best of my knowledge, the work reported herein does not form any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ACKNOWLEDGEMENT

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We take this opportunity to thank all our lecturers who have directly or indirectly helped our project. We pay our respects and love to our parents and all other family members and friends for their love and encouragement throughout our career. Last but not the least we express our thanks to our friends for their cooperation and support.

YouTube video link for the project -
https://www.youtube.com/watch?v=z9QHu1p4TMQ

ABSTRACT

The need for home security systems nowadays is a serious demand. As the number of crimes are increasing every day, there has to be something that will keep us safe. We are all aware of the high end security systems present in the market but they are not easily available to everyone. We therefore intend to provide a solution by constructing a cost efficient electronic system that has the capability of sensing the motion of the intruders and setting off the alarm. The basic idea behind this project is that all the bodies generate some heat energy in the form of infrared which is invisible to human eyes. But, it can be detected by electronic motion sensor.
The project involves the use of Arduino, motion sensor, buzzer, LCD display and a simple program. The sensor detect any motion in its permissible range and triggers the alarm.
It will also send the signal to Arduino which processes the signal and set off the alarm along with detection message on display. With this system we can easily set up a security alarm in our home for unwanted intruders.

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ABBREVIATIONS:

LCD : Liquid Crystal Display
PIR : Passive Infrared Sensor
LED : Light-Emitting Diode

CHAPTER -1
INTRODUCTION

We have designed an interesting and cheap home security alarm. This Gadget helps you to protect your house from thieves. In this project we are going to use an Arduino Uno R3 Board, P.I.R Sensor module, LCD and some other components. This Project can either powered with 9V Battery or with U.S.B of your computer.

This is a basic motion-sensing alarm that detects when someone enters the area. When an intruder is detected, it activates a siren. Our body generates heat energy in the form of infrared which is invisible to human eyes. But it can be detected by electronic sensor. This type of sensor is made up of crystalline material that is Pyroelectric. In this project, we are using P.I.R. Motion Sensor Module as an infrared sensor that generates electric charge when exposed in heat and sends a signal to Arduino. According to level of the infrared in front of sensor, Arduino displays the status on L.C.D and start buzzing speaker and glows the L.E.D. A simple program is running on Arduino which checks sensor if anything is moved or new object has been detected.

CHAPTER -2

Literature Survey

Goutam Saini

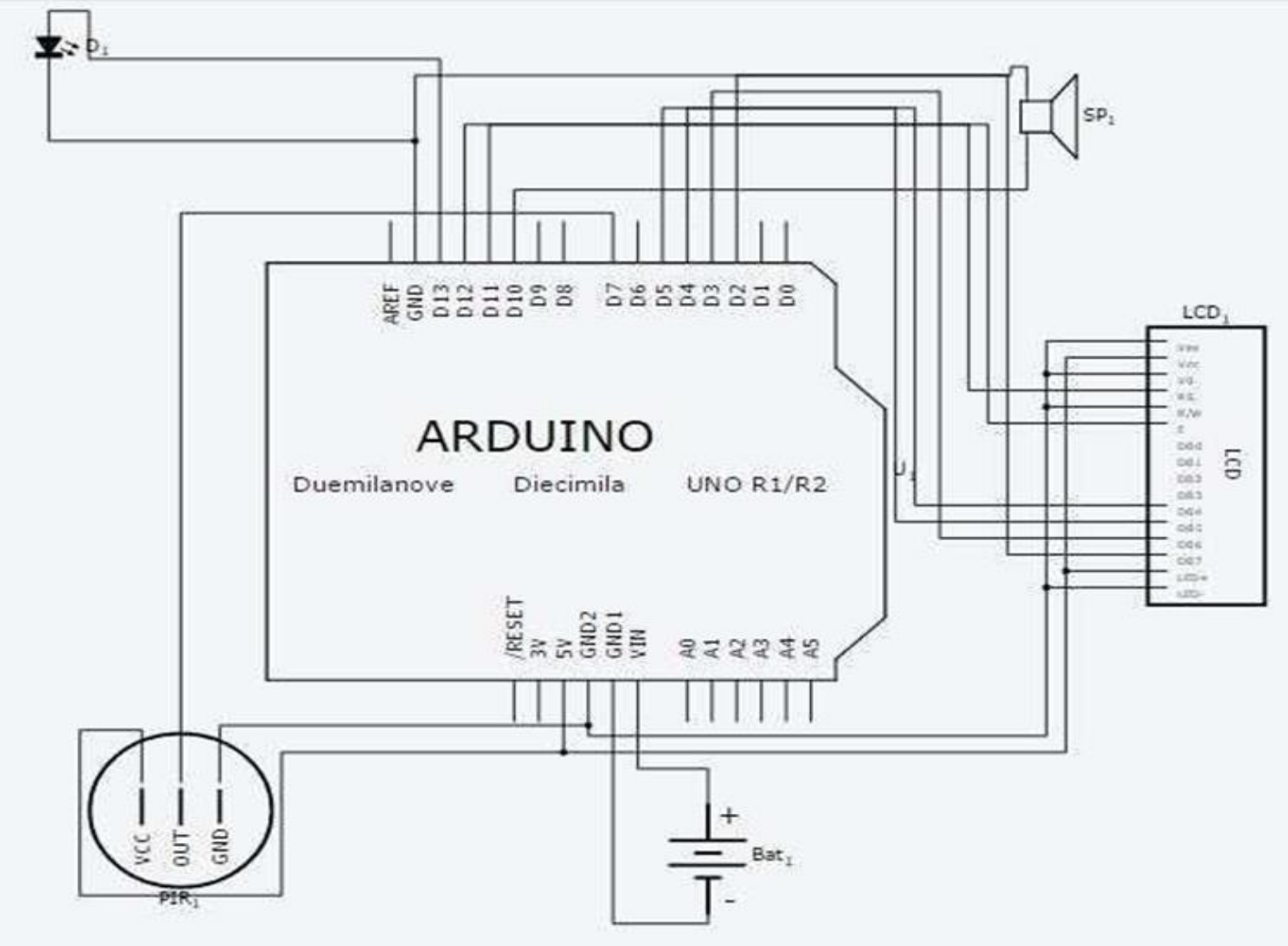
This paper deals with the design and implementation of Secure Home Automation using Raspberry Pi for mobile devices that leverage mobile technology to provide essential security to our homes and associated control operations. The proposed home security solution hinges on our novel integration of cameras and motion detectors into web application. Raspberry Pi operates and controls motion detectors and video cameras for remote sensing and surveillance, streams live video and records it for future playback, and finally manages operations on home appliances, such as turning ON/OFF a television or microwave.

Pridesh S

One of the topics which is gaining popularity is Home Automation System because of it's in numerous advantages. Home automation refers to the monitoring and controlling of home appliances remotely. with the never-ending growth of the Internet and its applications, there is much potential and scope for remote access and control and monitoring of such network enabled appliances. This paper deals with discussion of different intelligent home automation systems and technologies from a various features standpoint. The effort targeted on the home automation concept of where the controlling and monitoring operations are expediting through smart devices.

CHAPTER -3

SYSTEM ARCHITECTURE AND DESIGN



CHAPTER -4

METHODOLOGY

This system is a basic motion activated alarm. It is built around an Arduino Microcontroller. It is connected to a PIR motion sensor, a buzzer, a resistor, and a pair of external terminals. The whole system is battery powered so that it is easily portable. Once you have the code, you can connect all the external parts. The easiest way to do this is with a breadboard. This will let you make temporary connections to test everything out.

Step 1: Connecting the P.I.R sensor to Arduino:

1. Connect Vcc pin of P.I.R sensor to positive terminal of Arduino (5V).
2. Connect Gnd pin of P.I.R sensor to any ground pin of Arduino.
3. Connect out pin of P.I.R sensor to Pin no. -7 of Arduino.

Step 2: Connecting L.E.D and Piezo Buzzer To Arduino

Connecting L.E.D

Connect Positive terminal (Longer Lead) Of L.E.D To Arduino Pin no. 13.

Connect Negative terminal (Shorter Lead) Of L.E.D To Any Ground Pin.

Connecting Piezo Buzzer

Connect Positive terminal (Red Wire) Of Buzzer to Arduino Pin no. 10.

Connect Negative terminal (Black Wire) Of Buzzer to Any Ground Pin.

Step 3: Connecting L.C.D to Arduino:

To wire your LCD screen to your Arduino, connect the following pins:

LCD RS pin to digital pin 12

LCD Enable pin to digital pin 11

LCD D4 pin to digital pin 5 LCD

D5 pin to digital pin 4 LCD D6

pin to digital pin 3

LCD D7 pin to digital pin 2
Additionally, wire a 10K pot to +5V and GND, with its wiper (output) to LCD screens VO pin (pin3).

Step 4: Programming Arduino:

1. Download Arduino IDE 1.0.6 from https://www.arduino.cc/en/main/software.
2. Connect Your Arduino to your computer using USB Cable.
3. Open Arduino IDE, choose your correct board from Tools--Boards 4.Choose Your Correct Port from Tools--Serial Port
6. Copy the following sketch which appears in your Web Browser to your Arduino Sketch Page.
7. Click on Upload Icon or go to File—Upload

Step 5: Drill Holes in the Housing:

Next we need to drill a few holes in the housing so that we can mount all the parts. Start by using a ¼" hole in one end of the housing. This will be where we mount the buzzer. Then use a ¾" hole saw to drill a hole in the other side of the housing. This will be where we mount the motion sensor

Step 6: Glue the Motion Sensor and the Buzzer in Place:

Apply a small amount of hot glue around the motion sensor where it lines up with the hole in the housing. Then press the motion sensor into the hole. Apply more hot glue around the outside and hold it in place until the glue cools. Then apply a small amount of hot glue to the face of the buzzer. Align the hole in the buzzer with the hole in the housing and press it in place. Hold the buzzer in this position until the glue dries.

Step 7: Close Up the Housing:

The last thing that you need to do is connect the battery and close up the housing.

CHAPTER -5

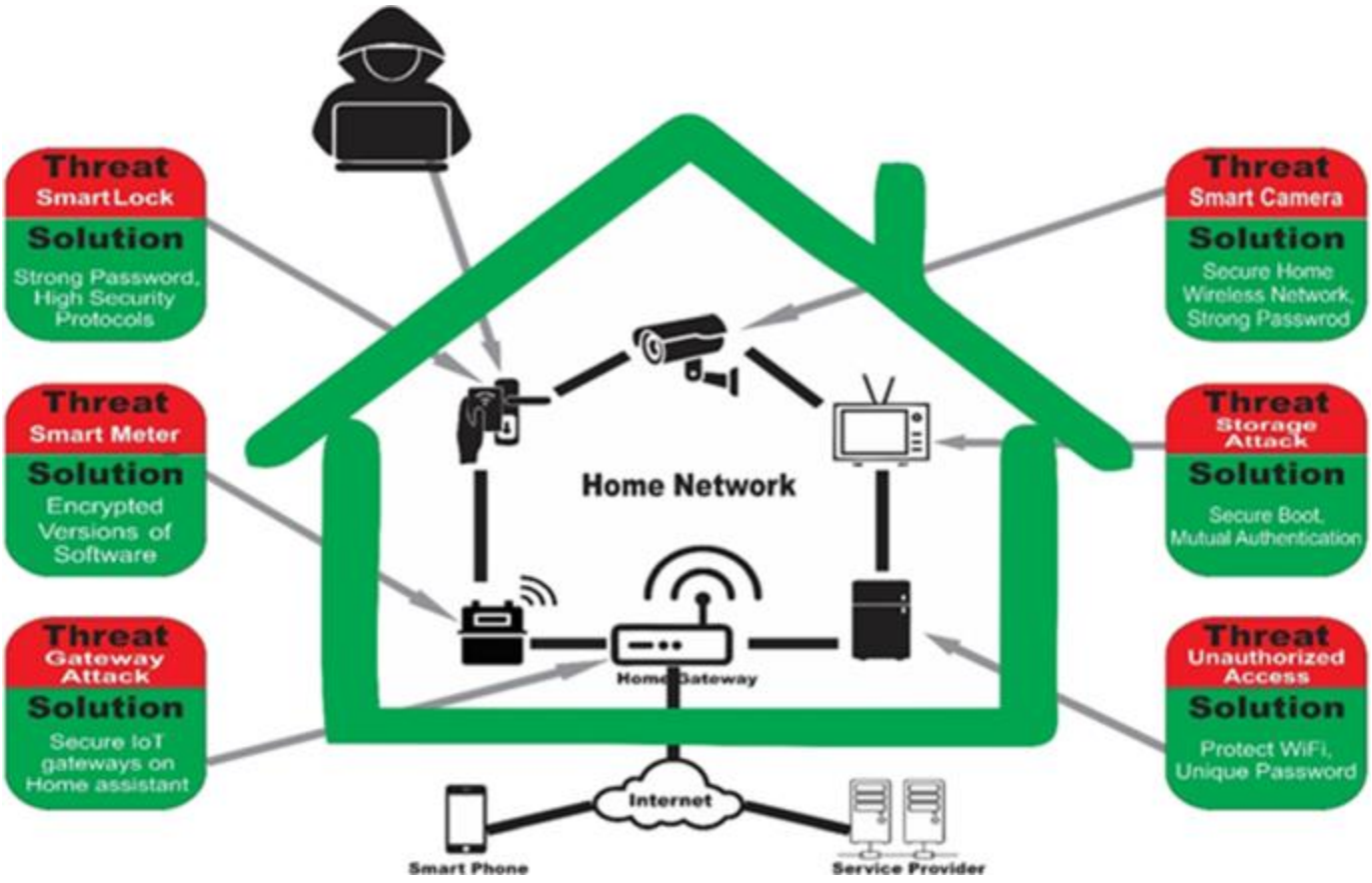
CODING & TESTING

```
//This Type of Sensor Detects Motion and lows L.E.D and Start Buzzing, It Also Displays that the "Motion is Detected" On An Lcd Screen
#include <LiquidCrystal.h>
int ledPin = 13;      // choose the pin for the LED
int inputPin = 7;     // choose the input pin (for PIR sensor)
int pirState = LOW;                 // we start, assuming no motion detected int val = 0;         // variable for reading the pin status
int pinSpeaker = 10;        //Set up a speaker on a PWM pin (digital 9, 10, or 11)
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);    // initialize the library with the numbers of the interface pins


void setup() { pinMode(ledPin, OUTPUT); // declare LED as output pinMode(inputPin, INPUT); // declare sensor as input
pinMode(pinSpeaker, OUTPUT); Serial.begin(9600);
lcd.begin(16, 2);
lcd.setCursor(2, 0);         // Set LCD cursor position (column, row) lcd.print("P.I.R Motion");
                // Print text to LCD
lcd.setCursor(5, 1);         // Set LCD cursor position (column,row)
lcd.print("Sensor");         // Print text to LCD
delay(4000); // wait 4s     // Delay to read text lcd.clear(); // clear LCD display                // Clear the display
lcd.setCursor(2, 0);         // Set LCD cursor position (column, row) lcd.print("Developed By");
                // Print text to LCD
lcd.setCursor(2, 1);         // Set LCD cursor position (column, row) lcd.print("Suman Ssk Vinit");                // Print text to LCD
delay(5000);// Delay to read text
lcd.clear();   // Clear LCD
lcd.setCursor(0, 0); lcd.print("Processing Data.");


delay(3000); lcd.clear(); lcd.setCursor(3, 0);
lcd.print("Waiting For"); lcd.setCursor(3, 1); lcd.print("Motion... ");
}
void loop(){
val = digitalRead(inputPin); // read input value
if (val == HIGH) {// check if the input is HIGH digitalWrite(ledPin, HIGH); // turn LED ON
playTone(300, 300);
```

```
delay(150);



if (pirState == LOW) {
// we have just turned on Serial.println("Motion detected!"); lcd.clear() ;
lcd.setCursor(0, 0);          // Set LCD cursor position (column 0, row 0) lcd.print("Motion
Detected!");

// We only want to print on the output change, not state pirState = HIGH;
}
} else {
digitalWrite(ledPin, LOW); // turn LED OFF playTone(0, 0);
delay(300);
if (pirState == HIGH){
// we have just turned of Serial.println("Motion ended!");

lcd.clear() ; lcd.setCursor(3, 0); lcd.print("Waiting For"); lcd.setCursor(3, 1);
lcd.print("Motion....");     // We only want to print on the output change, not state pirState =
LOW; } } }  // duration in mSecs, frequency in hertz
void playTone(long duration, int freq)
{duration *= 1000;
int period = (1.0 / freq) * 100000; long elapsed_time = 0;
while (elapsed_time < duration)
{ digitalWrite(pinSpeaker,HIGH)
;delayMicroseconds(period / 2); digitalWrite(pinSpeaker, LOW); delayMicroseconds(period /
2); elapsed_time += (period);
}
}
```

CHAPTER-6

SCREENSHOTS & RESULT



RESULT:

Thus, AI Based Home Security Model has been implemented successfully.

CHAPTER-7

CONCLUSION & FUTURE ENHANCEMENTS

CONCLUSION

Thus, we have designed a home security alarm system using Arduino and PIR motion sensor, which is handy, portable, cost-effective and highly effective as well. Such alarm systems are hugely in demand for security purposes, and thus the given system can be proved useful and effective in view of the above features.

FUTURE SCOPE

- We can add a keypad to arm or disarm the alarm
- We can determine the position of the intruder and then send a SMS to the concerned authorities.

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