

IOT Based Home Automation System

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Abstract— This paper is present on the bases of cost flexible, additional security material and user friendly to connect home appliances are connect with smart device by using the Arduino micro-controller with connecting through cable for accessing and controlling device by authorized user remotely using smart device. The purpose of designing the system to user internet of things control on human desired application to helpful for human need and save energy and work smartly. To demonstrate the effectiveness and feasibility of this system the paper will present for introducing the IOT based home automation by using Arduino UNO micro-controller and connecting with 8 channel relay module and connecting with Bluetooth with motion detection. It help the user to control various application such as light ,fan TV and can take decision based on the sense remotely.

Keywords: Arduino UNO, 8 Channel Relay Module, Bluetooth

I. INTRODUCTION

IOT based home automation the system we have created because of which we could run our home thing a bit like distance and perform various operation to make this possible, we took a micro-controller and Arduino UNO or computer technology

Home automation are popular day by day Acquires all home based IOT based home automation using day to day home automation artificial intelligence in now days because they provide easy to manage home appliances and control and they are user friendly simply they operated but any person and as much as they work fast also they are cost efficient this paper can describe the approach of IOT based home automation.

IOT based home automation trying to achieve the comfort combination with simplicity and simply we are taking and example of T.V in past we are using remote and perform to change a channel and easy to use but if there is some barrier are between user and T.V they are not working by resolving this issue we are using the smart phone connectivity with wifi modulo and they are easy to use.

Now we are coming on the security and safety now a days are crime rate is increasing so we are not trusted to any one for resolving this problem we make iot based home automation they perform as a security they have different type of security all time surveillance and bio matric detection and fingerprint sensor and face recognition and etc. Before enter to home they want to permission to the owner by saying a our work and designation and any other things

Is also eco-friendly when we enter into the room a they they detect the motion and turn on light and fan we exit from room and they turn off automatically so they save electricity and save the tree and eco-friendly they working process is that before discussing this we have to study at present working modal on IOT based home automation

II. EXISTING METHODS

A. Home Automation Based On Bluetooth Module

Home automation systems using smart-device, Arduino board and Bluetooth module technology are secured and cost efficient. A Bluetooth based home automation system made by R.Piyare and M.Tazil [2]. the Bluetooth system are using the phone and smart device to receiving the device data and interdicted with the device and they are also cost efficient and great security but according to me they having some drawback is there are limited for the short range to operate if the device go to the out of the range they does not work. They are not focus on the smart sensor the main disadvantage is they are not using the motion sensor all time they operate by phone/ smart device.

B. Home Automation Based On Voice Modulation

A voice based home automation are implanted by researcher [3]. the the untouchable technology is useful if we are simply say is most imp at that time because the spreading corona they are spread by touching to resolve the issue we simply using voice modulation system and perform best we can connect by the Wi-Fi or by Bluetooth technology. This is also helpful for handicapped and aged people they are major drawback is the if audio modulation having detect noise they does not work properly and if they do not hear any command so they does not work on the command

C. Home Automation System Based on Wi-Fi Modulation

ZigBee based wireless home automation system has also been studied [4], ZigBee is similar to Bluetooth technology. It is one of the broadly used transceiver standard with low data rate and power. It has physical range is between 10 to 20 meters, which can increase up to 150 meters by using direct sequence spread spectrum (DSSS). It is ideal for developing prototypes and research related activities.

D. Home Based on GSM Modulation

A smart home automation system implemented by using Global System for Mobile communication (GSM) [5]. In GSM based home automation systems, communication between main module and appliances is done through text messages. The main drawback of GSM based home automation system is that, there is no guarantee text message deliver to the system every time so it is not a reliable system.

These are the drawback of existing modal to resolve these problems we are implementing the IOT based home automation system.

III. ADVANTAGES

- They having the low cost system with minimum requirement as home automation.
- This home system dose not need any phone application to operate this device.

- To operate home automation we don't need any internet connection and LAN to operate this.
- Easy to implement simply say that user-friendly we can change according our usages.
- Most important advantage is AI based they ON automatic so we no need to touch so simply say|`CORONA PROOF'.

This idea may overcome the speed decrease .they also overcome the existing home automation.

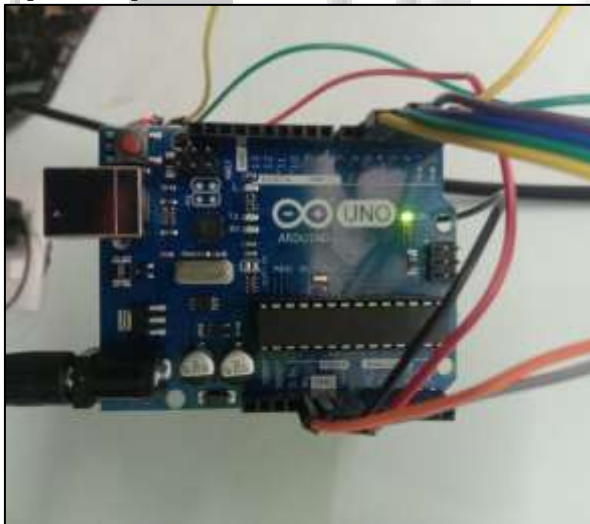
A. Required Equipments

- 1) Arduino UNO
- 2) PIR motion detector Sensor
- 3) Relay for connecting home appliances for controlling Switch ON or OFF
- 4) LM35 temperature Sensor
- 5) Jumper wire male to female to connecting devices
- 6) Arduino IDE(software)

B. Arduino UNO

This board is based on the ATmega328 micro-controller. It has 13 digital output pins 5 analogy pin for connecting the sensor, six of which can be used as Pulse Width Modulation (PWM) outputs, along with six more analog input pins.

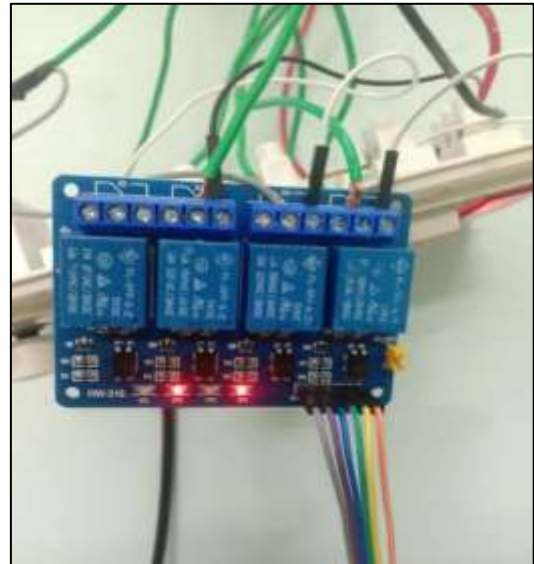
This board caring USB port for uploading a program by laptop/mobile phone and perform various operation some external power is required to start this Arduino 5 V there is reset pin also available here to reset the inbuilt program in this board and input different program analog reference pin also available all devices are connected to the digital input or output pins, Each of the 14 pins on the UNO can be used as an input or output.



They operate at 5 V with a maximum current of 40 mA. Each pin also has an internal pull-up resistor of 20–50 kOhms, although this is disconnected by default.they are connected with Arduino with USB A to B type cable.

C. Relay Board

it is an electronic switch which is use for connecting the home appliances to the Arduino and we simply we say that they gives connectivity and large voltage connectivity they are having the advantage they give the amplification and isolation to the current to the strain forward and they are junction board.



D. PIR sensor

A passive infrared sensor(PIR sensor) is electronic sensor device that measures infrared (IR) light radiation from things the module actually consist Apyroelectric sensor when expose to heat when animal and human body will get in the range of the sensor it will take the movement because the human and animal body emits it energy in a form of infrared radiation that whey the name of the sensor come from passive infrared sensor and the term as passive means the sensor is not using any energy the taking purposes it just work by the taking the energy given off by the other objects. the module also consist a especial deigned cover name Fresnel lens which office the infrared nose they detect the sensor . the module have 3 pins GND, VCC ,OUT this time can be adjusted from 0.3 sec to 5min the module is three more pin the jumper between on them. Then they have sensitivity up to 7 meter.



E. LM35 Temperature Sensor

Its working on the equation

// Convert the reading into voltage:

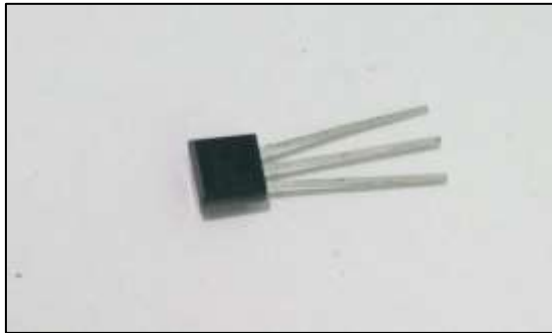
float voltage = reading * (5000 / 1024.0);

// Convert the voltage into the temperature in degree Celsius:

float temperature = voltage / 10;

LM35 is very unique sensor used to to major temperature In general a temperature sensor is deigned to to measure the hotness or coldness of an object this sensor detect the temperature and perform any operation they major a

approx or near by the temperature and it also posses low heating and does not cause more than 0.1 C temperature rise in still air.

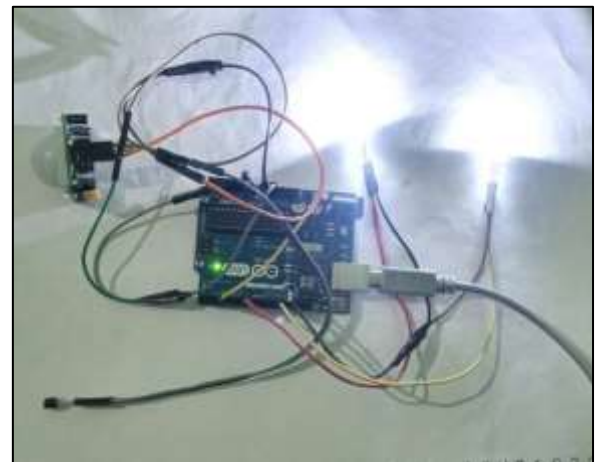
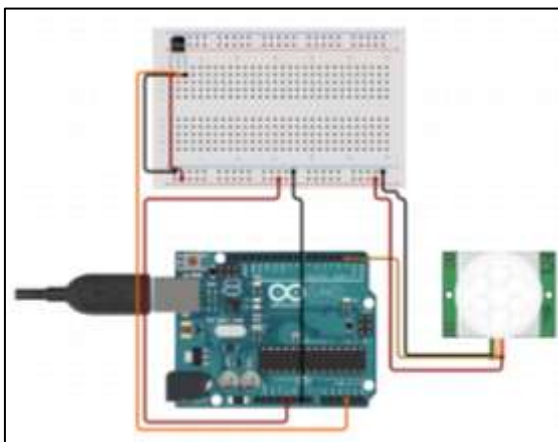


LM35 Features are Minimum and maximum input is 35v to -2v and also typically 5V, it can detect temperature ranging from -55 C to 150 C and output voltage and accuracy positive negative 0.2C

IV. IMPLEMENTATION AND DESIGN

The Arduino are connected with the PIR sensor with 3 pin ground pin(GND), VCC, output(OUTPUT) GND are connect with the Arduino GND pin and VCC are connected with 5V power board and output pin are connected with output 3 also they having the sensor or delay time facility we can delay by 0.3 to 5 min and sensitivity time we can increase 0 to 7 meter and they we have also connected a temperature sensor LM35 they also having the same 3 pin like a PIR sensor VCC ,GND or out they also connected same on Arduino but some change on VCC is that they are connected with ANOLOY pin A0 and we are connected a Arduino with the USB cable to upload a program and before that we have to install the Arduino IDB software and make code and implemented and upload the program and then disconnected with laptop and connected with relay and relay also having pins according to how many channel pin are using in it they also have GND , VCC an fall output pin and these pins are connected with relay and these application are connected with application and we can use simply and perform a operation

A. Overall circuit diagram

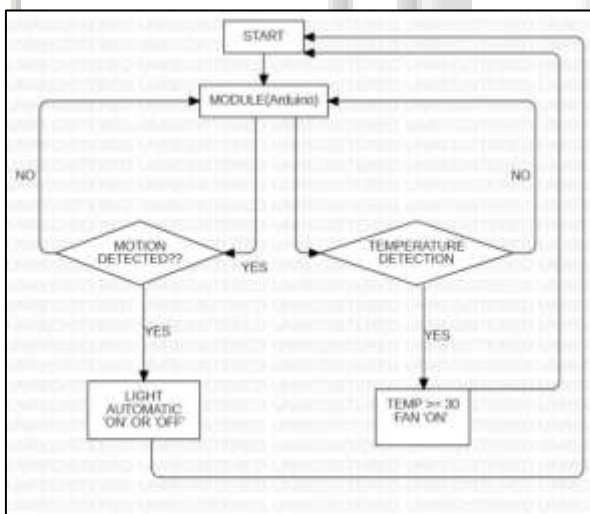


V. SOFTWARE





VI. FLOWCHART DIAGRAM



We can start a program the there module (Arduino UNO) then we go to the second out going statement they detect the motion and heat radiation if they detected a motion and heat radiation then command go to the Arduino uno to turn ON light and then they detect no movement and no heat radiation turn OFF light automatically after that they get back to the start again looping process occur again and again. Second statement also having the LM35 temperature sensor they get turn on power on they detect the room temperature if the room temperature id greater than 30 then FAN turn on automatically and if temp is less then 30 degree turn off and if someone come further they initialing from the start point.

VII. EXPERIMENT RESULT

After the successful connecting the wire and and program executed will allow to monitor and control the system by entering the a person then sensor get on and light get on and temperature sensor get work and they also get on when the temperature increase then FAN ON this model executed successfully. Result showing in coding figure.

VIII. CONCLUSION AND FUTURE SCOPE

The next phase for IOT based home automation market will occur based on few points improvement int the technology available in home automation we have to improve AI based automation solution and lowering the price of the product according to the point as market begin to accept home automation usage in large amount . it also have scope on the old fan and appliances we operate these appliances AI based technology and perform best. Market of automation product with intract user interface but at a lower cost price point of view. Most of the people will be able to afford the product but some are not but this device they also use appliances smartly

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