



IoT Based Home Automation System Using IR sensor

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Abstract : Now a days internet of things (IoT) is a Booming topic with development of automation technology. Where homes of upcoming generation are becoming more and more self controlled and automated due to the facilities and comfortableness provided by the automated gadgets. we are moving Towards computerization world , where automatic systems are preferred over the manual system.so this project design is proposed using IR sensor for controlling lights and fans using arduino uno . when a person enters the room, counter is incremented by 1 then Lights and Fans will turn on. The lights turns off when the visitor counter is zero. Here LCD displays the number of persons present in the room. The arduino uno does the all above job . It receives the signals from IR sensors, and these signals are managed under the Control of program, which is operated through the PC and stored in the ROM .Arduino uno continuously monitor the Sensors. When any Object pass through the Senors the Rays of IR sensors Detect the object . This Obstruction is sensed by arduino uno and counts the number of person enters and leaves the room.

Keywords: IoT (Internet of Things), IR (infrared)sensor , Arduino Uno , Home automation.

I. INTRODUCTION

The main reason of this research work is to implement wireless network among different gadgets which can be accessed through various sensors and internet. IoT system reduces efforts, energy losses , provide secure and comfortable life , upgrade the living standards . As we know IoT has become the Part of our day to day Activities it makes a person life easier and it can help the elder people ,handicapped and disable people to control and the home appliances automatically and remotely. IoT has solved many difficult real time problems and updated many existing system and made it flexible to use in our daily life. In recent years wireless devices like WI-FI has become more and more common in home automation , wireless Networking or technologies have several benefits that could not be achieved through wired network.

The concept “Automation” has existed from many years .It started with a student Connecting two electrical wires to the hands of an alarm clock in order to close the circuit of the battery and light bulb. Afterwards industries developed many automated gadgets of their own sensors , actuators and security cameras and so on . After this the first automated building was created and called it as “Intelligent Home”. This model is very useful for such problems were people forget to switch off the lights , fans and other appliances while leaving the room or home.The main aim of this project is to make model which automatically control the light and other devices when a person enters the room.Based on a prototype it must count the number of persons enters the room and automatically lights turn on .when there is nobody in the room the lights and fan will be off.

The main method for Counting the number of persons involves hiring man to count number of visitors who enter and exist manually is unreliable and it comes at great cost .for example, In situations where a many number of visitors entering and exiting the malls , stadium , libraries ,conference room and so , calling a for man to manually count the number of visitors may result in inaccurate data collection. So over come this problem this model is very efficient and flexible for collecting such information .

II. LITERATURE SURVEY

It is research work which can be taken as a references for IoT Based Home Automation Using IR sensors .

- **Sharon panth & jivani mahesh [1]** : Has Proposed a technique called automated home using android . Here the authors deliberate the use of android phone Inbuilt facilities and discuss about the Bluetooth and how to control home appliances along with 8 bit Micro-controller and ATMEL 89C51 .
- **Pawan Sharma & Joshi Deepika [2]** : Has proposed a technique controlling home appliances with remotely and using



infrared technology. They have invented a new remote control circuit to grant the automatic control of appliances and switchboards from remote location that does not require any internet as well as any as mobile network or battery. It is completely hardware based model and does not need any software to monitor the system.

- **Monika Rana & Ramandeep Singh [3]** : Has proposed an different way of home automation through the PC-Internet-Uno micro-controller based home automation system. System has two operational modes,First manually automated mode and self automated mode. This contains two main components one is PC Home server and Arduino -Uno.
- **Naresh P Jawarkar & Vasif Ahmed [4]** : Has proposed a methodology where they shown us home appliances can also be controlled by Micro controller based remote monitoring system using mobile through voice commands .
- **Samiran Maiti & Pabitra Kumar Nandi [5]** : Has demonstrated a solution for Home appliances controlled by the use of IR remote signal decoder . Here they have discussed about the uses of NEC555 timer IC, decade counter ,traiac analog with IR sensor To automate the home .It is totally a hardware project.
- **Satish Palaniappan & Naveen Hariharan [6]** : Has shown us the way of accessing remote Home appliances to the user by using GSM technology and Zigbee technology.

III. PROPOSED TECHNIQUE TO AUTOMATED HOME

After considering all above models , I have designed a model that to the home appliances using IR sensor and arduino uno Micro controller .The proposed methodology uses IR sensor to detect the motion of a human being that passes thorough the IR sensor Rays and count the number of person present in the home.It also focuses on disable people and elderly people.It is inexpensive and easy to install.

IV. METHODOLOGY

Arduino uno micro controller is used control the IR sensor and other Electrical appliances . Here arduino UNO will get signal from the IR sensor then arduino will send signal to the relay and LCD display where in LCD display the Number of count of people is increased by one and relay will turn on all the home appliances connected to it .The flow of the model will be Continuously constant until the count of person in the room get zero. Then all the home appliances will be switched off.

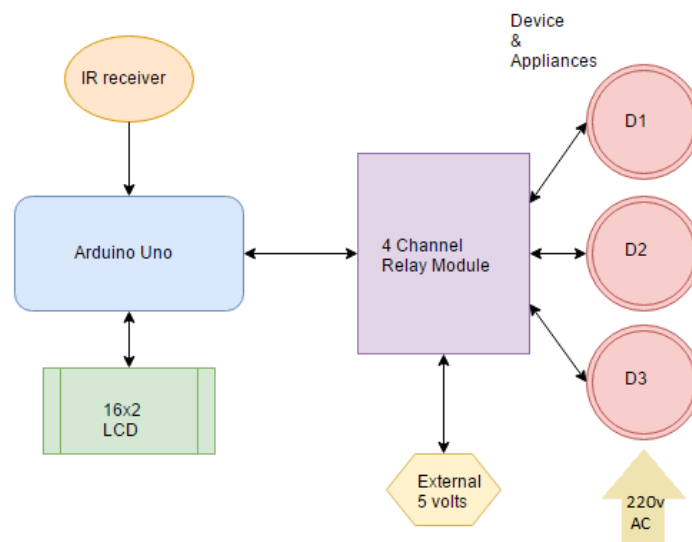


Figure 1 : Block Diagram



V. CIRCUIT DIAGRAM

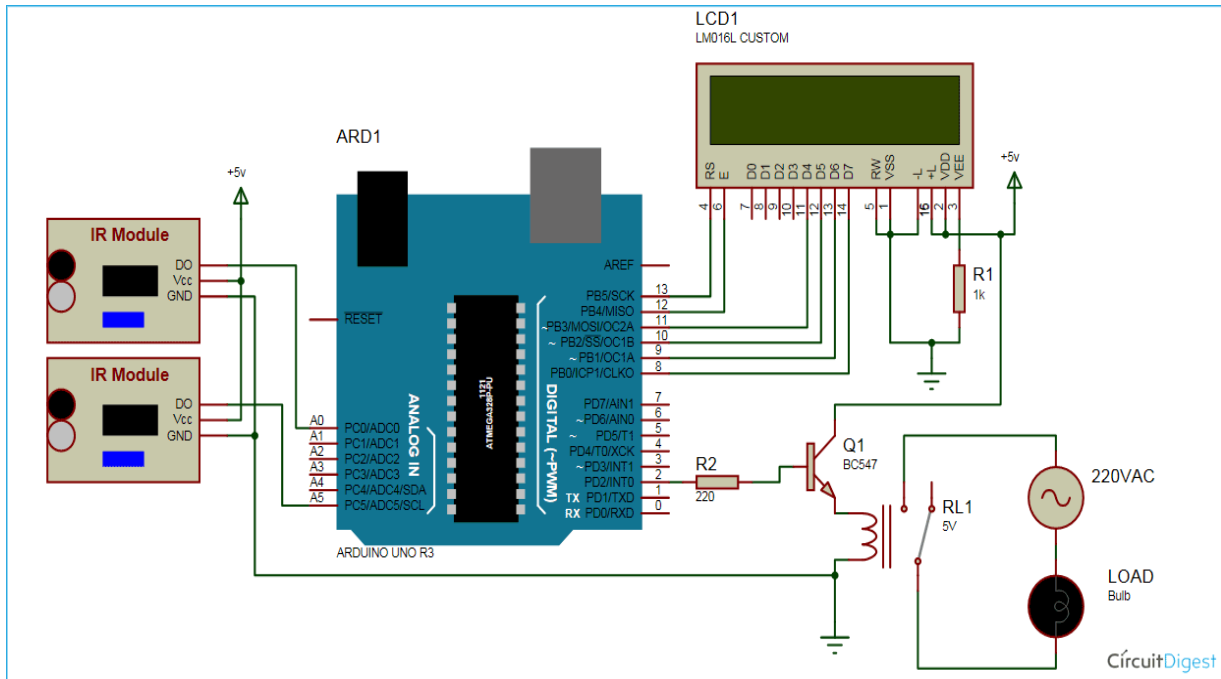


Figure 2: Circuit Diagram of Home Automation using IR sensor

VI.HARDWARE COMPONENTS

✧ Arduino Uno :

Arduino uno is the main component of our model. It is open source hardware component with low-cost , flexible to use and easy to program . Arduino can communicate with all devices like LED ,Engine ,Speakers ,GPS , Camera , Web servers and even with our advanced android cell phones. It is 8-bit micro controller with 32KB of flash memory and 2KB of RAM .It is maximum flexible hardware component based on ATmega328P Which can be discussed ,where it can be used.It contains 6 analog inputs and 14 digital input/output pins.



Figure 3: Arduino Uno Board

✧ 16 * 2 LCD display

LCD (liquid crystal display) screen is digital display module .It is a basic module and commonly used in various circuits.there is no limitation of displaying any special or any custom Character.It displays 16 characters in a single line and it contains 2 lines. It has two registers, command and data. Here register contain the command given to the LCD. It has predefined tasks such as setting the position of cursor ,initializing it , clearing the display and maintaining the display etc . LCD display data is in the ASCII value.



Figure 4 : 16*2 LCD display

✧ Jumper wires

Jumper wires are the electrical wires or group of cables, some of which have connectors or pins. And it is normally used to connect the components from one device to another without soldering.

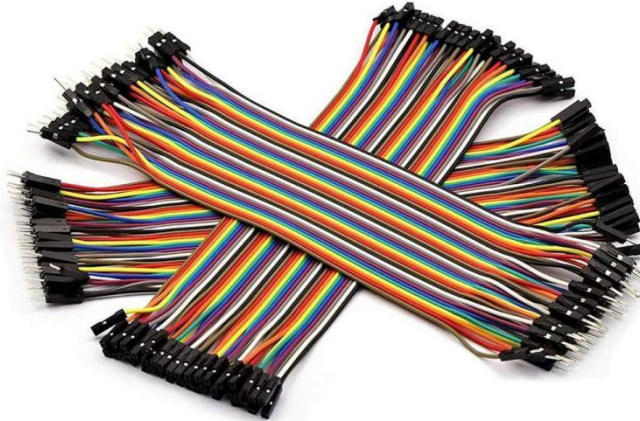


Figure 5 : Jumper wires

✧ Breadboard

Breadboard is the prototype with test circuit designs and electronics. Most of the electronics devices can be interconnected by inserting the pins into the hole of the breadboard and making two or more devices connect each other.



Figure 6 : Bread Board

✧ Relay

The relay module is an electrical switch that works on an electromagnet. Here the electromagnet works on a separate low signal from an Arduino Uno microcontroller. When the electromagnet is activated, it opens or closes the circuit so that current flows.



Figure 7: Relay

◇ IR(infrared) sensor

IR sensor is an electrical component used to detect the objects and and specific characteristics present in it surroundings through the detecting IR sensor Rays or Radiation .The IR Sensor can also be used to measure the heat and motion.This type of sensors is same as human imagination to sense the object.



Figure 8: IR sensor

VII.RESULT

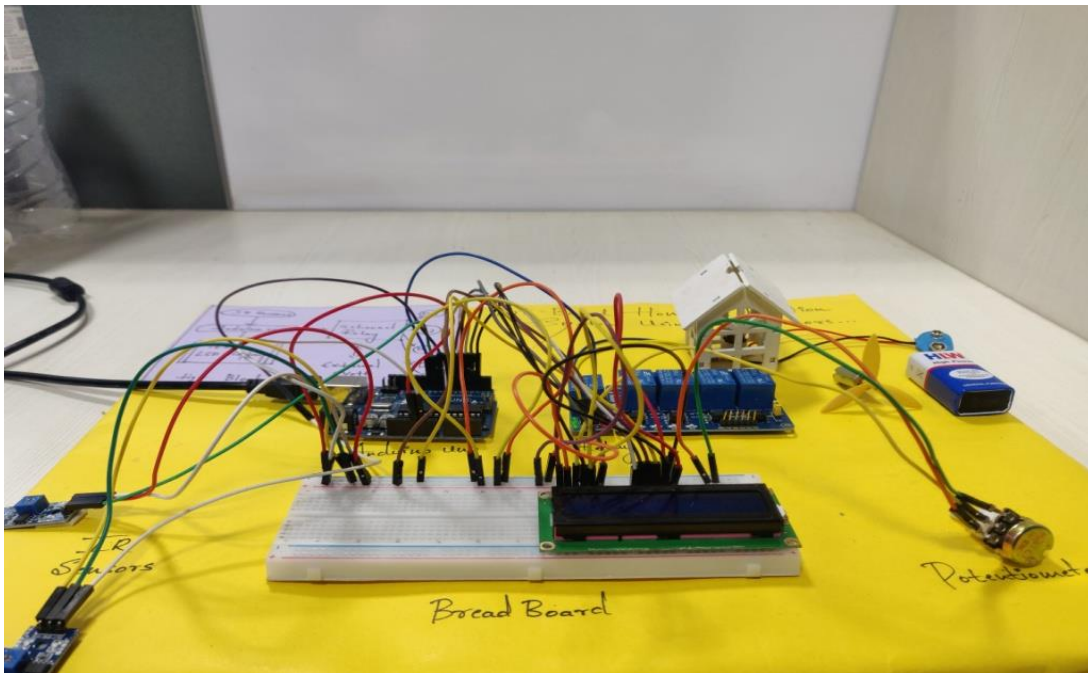


Figure 9 : Connection of Home automation system using IR Sensor

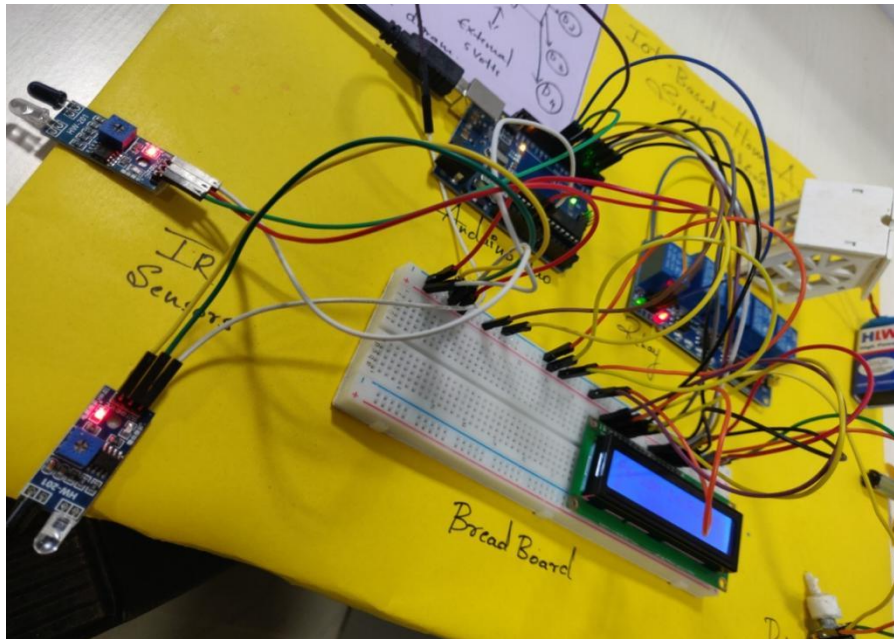


Figure 10: IR sensor Detecting the object

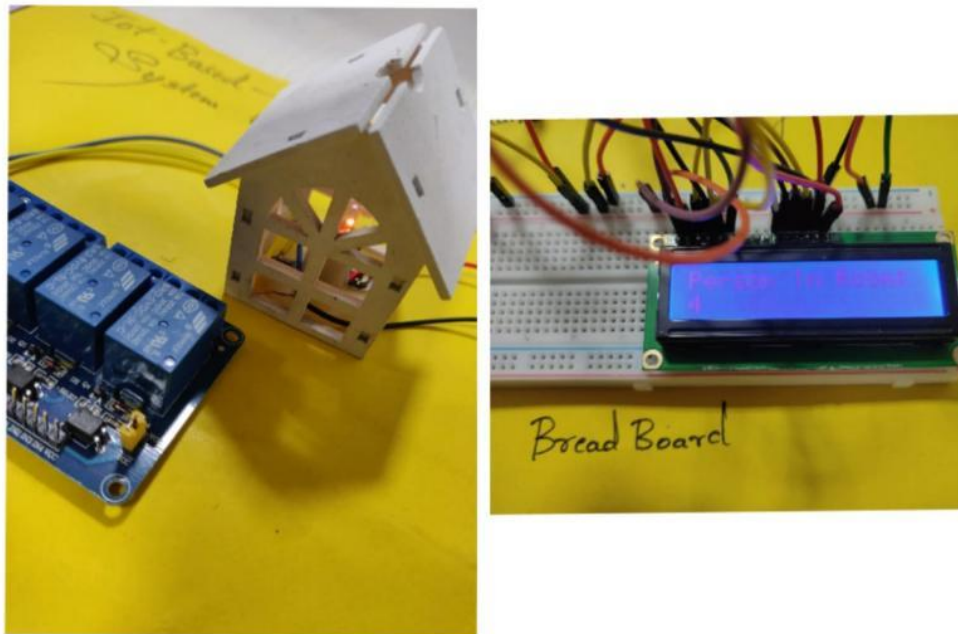


Figure 11: lights turned on after sensing the motion

VIII.CONCLUSION

The proposed model saves the usage of energy in this competitive world of electricity. Here the model is so well organized and it also counts the number of members present in the room. when IR sensor detects the motion of the person or a object, the count of visitors get incremented by 1. Then the electrical home appliances connected to it get turned ON. If the count of person in the room is 0 then lights and fans get turned OFF.



XI. FUTURE SCOPE

By using this model properly we can load different appliances depending upon the power supply such as A/c ,Kitchen Exhausters , Tube lights ,Fans etc. By modifying the circuit of the model we can make door open and close when IR sensor detects the motion of person . If we set limit to number of persons entering the we can implement voice alarm system to indicate the room is full.

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BIOGRAPHY



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