International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES)
Impact Factor: 5.22 (SJIF-2017), e-ISSN: 2455-2585
Volume 4, Issue 6, June-2018

APPLICATION OF IOT IN HOME AUTOMATION SYSTEM USING ARDUINO

Karthika.R[1],Dr.N.shenbagavadivu[2],Sivapriya.M[3]
PG scholar[1], Assistant professor[2], Research scholar[3]
Department Of Computer Application,
Anna university ,BIT campus,
Tiruchirappali,Tamil Nadu ,India.
Karthika05mca@gmail.com[1], kshenthu@gmail.com[2], nsiva_priya@yahoo.com[3].

Abstract

Internet of things (IOT) is a concept that interconnect all objects around as part of internet. In IoT sensor plays a vital role. It enables physical objects used in day to day life to connect to the internet and exchange data. The objective of the project is to monitor the status and control the ON/OFF of the light in home by web as well as mobile environment. Aim of this project is to develop simple application in home automation system using Arduino programming. In this proposed Arduino based home automation system the light control and monitoring will be done by Arduino Uno and relay connected to LED bulb and LDR sensor, PIR Sensor and Bluetooth transceiver.

Keywords: Arduino Uno, PIR sensor, Bluetooth, transceiver, LED bulb.

I. INTRODUCTION

The internet of things (IOT) is a platform in which it is used connect to physical devices, home appliances and mobile devices. It has embedded software, electronics, sensors, actuators and connectivity with enables these objects to connect and exchange data. These data are stored for future predication process.The program is written in Arduino IDE software which is said to be an Integrated Development Environment. The program is written and complied in arduino IDE and it is upload to physical board using USB cable from the computer code to the board. Arduino board consist of microcontroller, analog pin, GND etc. It is an open source electronic prototyping system arduino platform. Arduino is meant to be used as a physical computing platform. Arduino builds on this by adding simplicity to the hardware interface and an easy to use software package. Android is an open source operating system in Linux kernel. Android is a mobile operating system developed by Google. Furthermore it utilizes a custom java virtual machine that was designed to optimize memory and hardware resources in a mobile environment.

II. LITERATURE SURVEY

Abhishek Bhatt and others in their work Home Automation Using Internet of Things developed a system using Arduino IDE for controlling home appliances like Lights, fan, etc.The system consists of a micro Web - server based on Arduino Ethernet and hardware interface modules. This system allows authorized home owners to control and monitor connected devices at home. The web server provides a graphical user interface (GUI) for accessing and controlling the devices.

DhakadKunal and others in 2016 proposed a work Smart Home Automation using IOT. The proposed system has two scenarios where first one is denoted as a wireless based and the second is a wire-line based scenario. The Wi-Fi communication technology is addressed by Cellular phone with Mat lab-GUI for monitoring and controlling processes. This system proposes a home automation system to help the handicapped. The home appliances are controlled through web.

Waiz khan and Shalini khan in their work Smart Home (Home Automation) the appliances were controlled using DTMF encoder and Arduino UNO. This work aims highly to reduce cost of devices and energy consumption. This work also provides an automatic security system for doors. Home automation using such technology to control and perform daily chores, saving time and energy.

In the work GSM Based Home Automation System the author discusses a home automation system based on GSM technology. The developed system, uses mobile technology that keep control of the various units of the automobiles, executes with respect to the signal sent by mobile. This system proposes an automation system that controls the appliances using GSM mobile phones.

A.Vinodhkrishnan and others in their work Smart Home Automation System Using Arduino and Bluetooth technology. The electrical appliances are automated from remote distances by using Bluetooth technology. Here Bluetooth technology is used which controls the electrical appliances only from short distance.

Mohamed and Soliman in their work Towards the Design and Implementation a Smart Home Automation System Based on Internet of Things Approach. This proposed system has two scenarios where first one is denoted as a wireless based and second is a wire-line based scenario. This paper presents a design concept for smart home automation system based on the idea of the internet of things technology. Cellular phone with mat lab platform for monitoring and controlling processes through Wi-Fi module communication technology.

III. PROPOSED WORK

In Existing system they use Bluetooth module in home automation for control light on and off condition. In the proposed method consists of an Arduino Uno, a relay board to relay the current, a regulated power supply to convert ac power to dc, a breadboard to aid with the connections and a.c power supply.

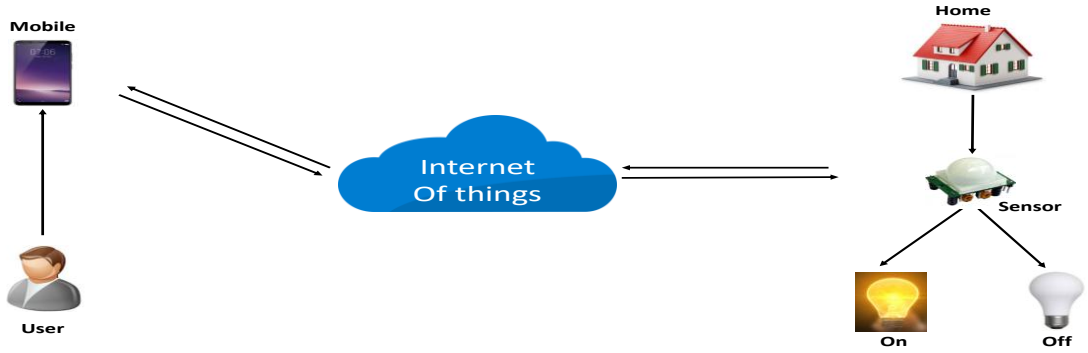

Fig.1 System Architecture diagram

The proposed system controls the on and off status of light in a room and the status seen over mobile.The light status (on/off) is controlled through the mobile application from any remote places. Hence electric power consumption can be reduced.

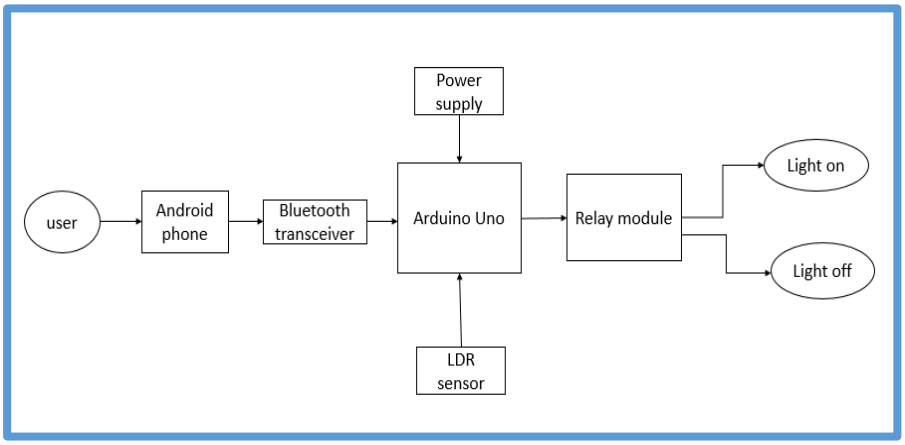

Fig.2 The block diagram of proposed system

3.1 SENSORS

Application of IOT in home automation system using arduino consists of two types of sensor:

(A) **LDR Sensor:**

A photoresistor or light dependent resistor, LDR, or photo conductive cell is a light controlled variable resistor. The resistance of a photoresistor decrease with increasing incident light intensity; in other words, it exhibits photoconductivity. A photoresistor can be applied in light –sensitive detector circuits,and light activated and dark activated switching circuits.

(B) PIR Sensor:

A passive infrared sensor (PIR sensor) is an electronic being emitted from objects in its field of view. They are most often used in PIR based motion detectors.

3.2 Arduino Uno

Arduinois an open-source platform and it also of both a physical programmable circuit board .It is often referred to as a micro controller .And a software called Integrated Development Environment that runs and compile program on computer, used to upload computer code to the physical board. The program is uploaded to the physical board by using USB port .All the electronic components required for the project is connected to the arduino board.

Fig 3: Arduino Uno Board

3.3 Relay Board

A relay is an electrically operated or electromechanical switch composed of an electromagnet, an armature, a spring and a set of electrical contacts. Relays are necessary when there must be electrical isolation between controlled and control circuits, or when multiple circuits need to be controlled by a single signal.

IV. SIMULATION

i) Arduino board with LED bulb blinking

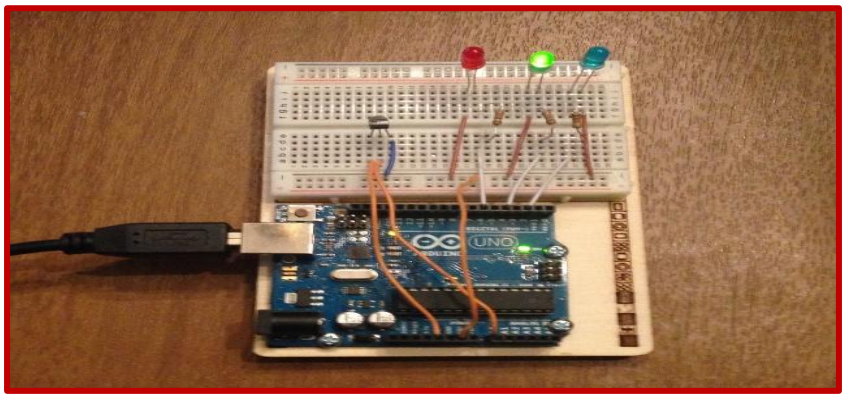

Fig.4 Arduino with LED bulb connection

The above figure shows the connectivity of Arduino Uno with LED bulb. In arduino input pins with analog are used for connection LED.

ii) Arduino with PIR sensor

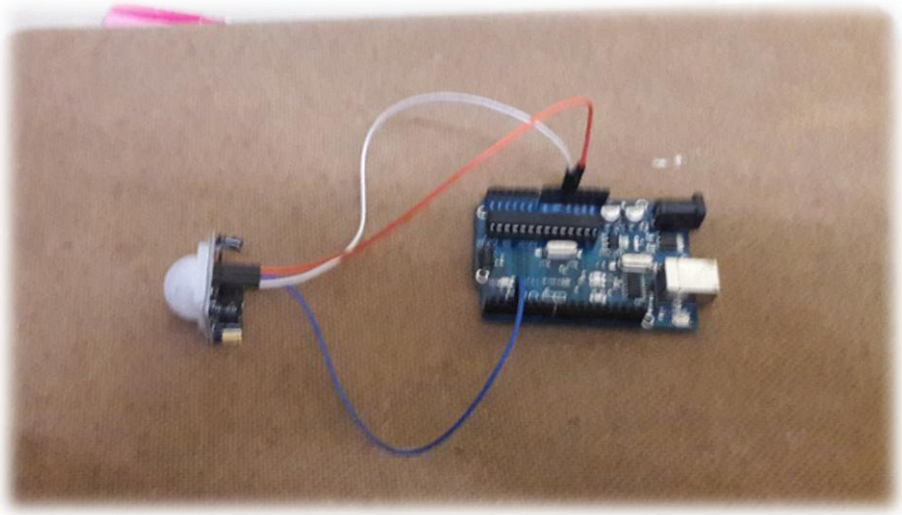

Fig.5 Arduino board with PIR sensor connectivity.

The above figure shows the connectivity of arduino Uno with PIR sensor. PIR sensor input pins vcc, analog, and GND etc.

iii) PIR Sensor With LED

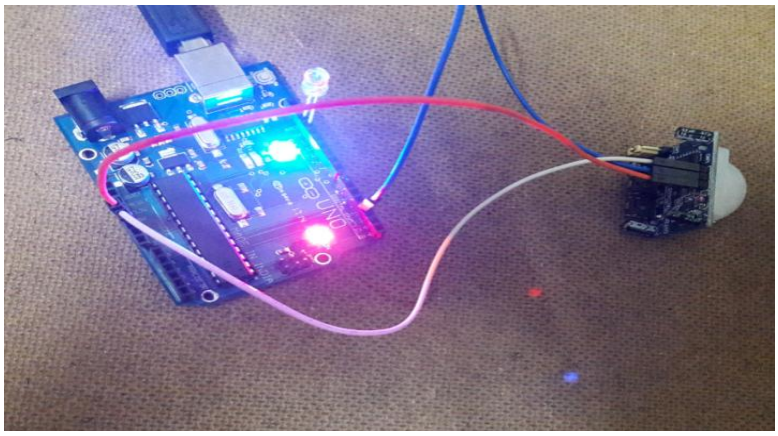

Fig.6 PIR sensor with LED connectivity.

The above figure shows connectivity for arduino Uno with LED bulb and PIR sensor.

iv) Arduino Uno with LDR Sensor

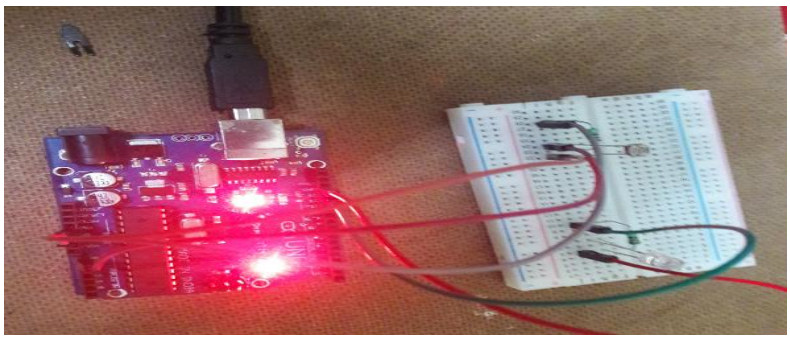

Fig.7 Arduino with LDR sensor and LED connectivity.

The above figure shows connectivity for arduino Uno with LED bulb and LDR sensor.

v)Arduino Uno with relay board and LED bulb

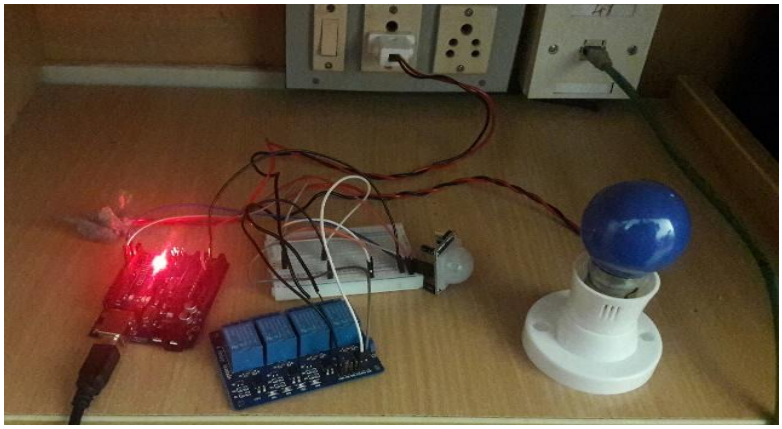

Fig.8 arduino with relay and PIR sensor connectivity.

The above figure shows connectivity for arduino UNO with relay channel,PIR sensor and light control .

Vi)Arduino Uno with relay board,PIR sensor and control light

Fig.9 Arduino Uno with relay board, PIR sensor connectivity.

V. CONCLUSION

Hence arduino based home automation system to control the light from remote places have been implemented. This system proves to be cost effective by means of android application for controlling the status of light (on/off).

REFERENCES

[1] Mohamed S. Soliman, Majed O. Dwairi, Iman I. M. Abu Sulayman1 "Towards the Design and Implementation a Smart Home Automation System Based on Internet of Things Approach **"**International Journal of Applied Engineering Research ISSN 0973-4562 Volume 12, Number 11 (2017) pp. 2731-2737.

[2] AbhishekBhat, Satvik Sharma, Pranav K.R" Home Automation Using Internet of Things" International Research Journal of Engineering and Technology (IRJET) e- ISSN 2395-0056.

[3] Waiz Khan, Shalini Sharma" Smart Home (Home Automation)" International Journal of Latest Transactions in Engineering and Science.

[4] A. Vinodha Krishnan, J. Indira Priyadharshini, T. Sivaranjani" Smart Home Automation System Using Arduino" International Journal of Engineering Sciences & Research Technology.

[5] vini Madam S.R.N Reddy,"GSM-Bluetooth based Remote Controller", International Journal of Computer Applications, Volume46-No.1, May 2012.

[6] E.Isa and N.Sklavos,"Smart Home Automation: GSM Security System Design &Implementation "Journal of Engineering Science and Technology Review10 (3) (2017).

[7] Gaga deep Singh Tuteja, Sachin Pandey, "Home Automation and Security System Using IOT", International Journal of Research in Science & Engineering Volume: 3 Issue: 2 March-April 2017.

[8] N. Sriskanthan and Tan Karand. "Bluetooth Based Home Automation System". *Journal of Microprocessors and Microsystems, Vol. 26, pp.281-289, 2002. [9].*

[9] Sougata Das, NilavaDebabhuti, Rishabh Das, Sayantan Dutta and Apurba Ghosh, "Embedded System for Home Automation Using SMS" IEEE International Conference on Automation, Control, Energy and Systems (ACES), pp. 1-6, Feb 2014.

[10] S.Syed Imran J.VigneshVikash Kumar Singh Dr.T.Arunprasath," Smart Home Automation Based On IoT Using Arduino Mega", International Conference on Current Research in Engineering Science and Technology (ICCREST-2016**).**