# HOME AUTOMATION USING ARDUINO




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# CANDIDATE'S DECLARATION

It is declared hereby that this thesis paper or any part of it has not been submitted to anywhere else for the award of any degree.

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# Certification

**This is to certify that this project entitled "HOME AUTOMATION USING ARDUINO UNO" is done by the following students under my direct supervision. This project work has been carried out by them in the laboratories of the Department of Electrical and Electronic Engineering under the Faculty of Engineering, Sonargaon University (SU) in partial fulfillment of the requirements for the degree of Bachelor of Science in Electrical and Electronic Engineering.**

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We are, indeed, grateful to all those from whom we got sincere cooperation and help for the preparation of this report

# ABSTRACT

The main objective of this project is to develop a home automation system using an Arduino board with Bluetooth being remotely controlled by any Android OS smart phone. As technology is advancing so houses are also getting smarter. Modern houses are gradually shifting from conventional switches to centralized control system, involving remote controlled switches. Presently, conventional wall switches located in different parts of the house makes it difficult for the user to go near them to operate. Even more it becomes more difficult for the elderly or physically handicapped people to do so. Remote controlled home automation system provides a most modern solution with smart phones. In order to achieve this, a Bluetooth module is interfaced to the Arduino board at the receiver end while on the transmitter end, a GUI application on the cell phone sends ON/OFF commands to the receiver where loads are connected. By touching the specified location on the GUI, the loads can be turned ON/OFF remotely through this technology. The loads are operated by Arduino board through opto- isolators and thyristors using trials.

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# INTRODUCTION

## 1.1 Introduction

The "Home Automation" concept has existed for many years. The terms "Smart Home", "Intelligent Home" followed and has been used to introduce the concept of networking appliances and devices in the house. Home automation Systems (HASs) represents a great research opportunity in creating new fields in engineering, and Computing. HASs includes centralized control of lighting, appliances, and other systems, to provide improved comfort, energy efficiency and Automation system. HASs becoming popular nowadays and enter quickly in this emerging market. However, end users, especially the disabled and elderly due to their complexity and cost, do not always accept these systems. Due to the advancement of wireless technology, there are several different of connections are introduced such as GSM, WIFI, and Bluetooth. Each of the connection has their own unique specifications and applications. Among the four popular Bluetooth connections that often implemented in HAS project, Bluetooth is being chosen with its suitable capability. The capabilities of Bluetooth are more than enough to be implemented in the design. Also, most of the current laptop/notebook or Smartphone come with built-in Bluetooth adapter. It will indirectly reduce the cost of this system. ,« This project forwards the design of home automation system using Arduino uno, a credit sized computer. Arduino provides the features of a mini computer, additional with its digital pins where other components and devices can be connected. Digital pins registers of Arduino are used for the output purposes. The home appliances are connected to the input/output ports of Arduino along with the jumper wire and their status is passed to the Arduino. The android running OS in any phone connected to a network can access the status of the home appliances via an application. It presents the design and implementation of automation system that can monitor and control home appliances via android phone or tablet.




Figure 1.1 Bluetooth Control Home Automation

## 1.2 Objective of the Project:

The project here is all about a Bluetooth control Home Automation, In this project we have planned to develop a Bluetooth control Home Automation. HC 05 works on serial communication. The Android app is designed to send serial data to the Arduino Bluetooth module when a voice is send through the app. The Arduino Bluetooth module at other end receives the data and sends it to the Arduino through the TX pin of the Bluetooth module (connected to RX pin of Arduino). The code uploaded to the Arduino checks the received data and compares it. If the received data is light on, the 1st relay turns ON. The 1st relay turns

OFF when the received data is light off. If the received data is fan on, the 2nd relay turns ON. The 2n relay turns OFF when the received data is fan off. If the received data is ac on, the 3rd relay turns ON. The 3r relay turns OFF when the received data is ac off. If the received data is tv on, the 4ff relay turns ON. The 4 relay turns OFF when the received data is tv on. You can open the serial monitor and watch the received data while connecting.

## 1.3 Overview of the Proposed System

A free standing intrusion detector to be set in an arca of said home to be protected, said free standing intrusion detector comprising :An intrusion detector to generate an intrusion signal in response to an intrusion into said arca; A radio signaling transmitter responsive to said intrusion signal to transmit a radio signal means for modulating said radio signal for a predetermined time in response to said intrusion signal; and time delay means for delaying the actuation of said intrusion detector to allow a person sufficient time to exit said area to be protected aner setting said intrusion detector; and a portable receiver adapted to be hand carried comprising. Means for generating an output signal in response to said radio signal. Display means for generating a visual display indicating an intrusion has occurred in response to said output signal.

## 1.4 Project Outlines

Home Automation System using Arduino and Bluetooth system final thesis is arranged into following chapter:

- Chapter 1: Basically is an introduction of the project. In this chapter, provides the background of the project, objectives, scope of the project, and also the thesis outline. • Chapter 2: Focused on familiarization of the elements and devices and the in features those used in this project.
- Chapter 3: Mainly focused on methodologies for the development of home Automation System. Details on the progress of the project are explained in this chapter.
- Chapter 4: Presents the results obtained. All discussions are concentrating on the result and performance of our designed project.
- Chapter 5: Concludes overall about the project. Future recommendations are also discussed in this chapter.

# CHAPTER 2

# COMPONENT

## 2.1 Microcontroller

A Microcontroller (or MCU) is a computer-on-a-chip used to control electronic devices. It is a type of microprocessor emphasizing self-sufficiency and cost-effectiveness, in contrast to a general-purpose microprocessor (the kind used in a PC). A typical microcontroller contains all the memory and interfaces needed for a simple application, whereas a general purpose Microprocessor requires additional chips to provide this factors. So as they have all the 10 and memory built on the chip it is very easy to use them in power and space restricted environments. And also as they are very cheap compared to typical PC microprocessors, they can be used almost everywhere. Now a day's almost all electronics products contain some form of microcontroller to make our life a lot easier by automation.

Although they seem to be too slow and have insanely low amount of memory they are very energy efficient. And most of the jobs they do does not require very powerful processors. A microcontroller is a single integrated circuit with the following key features:

a) Central processing unit - ranging from small and simple 8-bit processors to sophisticated 32- or 64-bit processors*

b) Input/output interfaces such as serial ports

c) Peripherals such as timers and watchdog circuits

d) RAM for data storage

e) ROM, EEPROM or Flash memory for program storage

f) Clock generator - often an oscillator for a quartz timing crystal, resonator or RC circuit.

## 2.2 Utilities of Microcontroller

Like all good things, this powerful component is basically very simple. It is made by mixing tested and high-quality "ingredients" (components) as per following receipt:

The simplest computer processor is used as the "brain" of the future system. Depending on the taste of the manufacturer, a bit of memory; a few A/D converters, timers, input/output lines etc. are added all that is placed in some of the standard packages.

Simple software able to control it all and which everyone can easily learn about has been developed.

On the basis of these rules, numerous types Of microcontrollers were designed and they quickly became man's invisible

companion. Their incredible simplicity and flexibility conquered us a longtime ago and if you try to incent something about them, you should know that you are probably late, someone before you has cither done it or at least has tried to do it. The following things have had a crucial influence on development and success of the microcontrollers:

Powerful and carefully chosen electronics embedded in the microcontrollers can independently or via input/output devices (switches, push buttons, sensors, LCD displays, relays etc.), control various processes and devices such as Industrial automation, electric current, temperature, engine performance etc.

Very low prices enable them to be embedded in such devices in which, until recent time it was not worthwhile to embed anything. Thanks to that, the world is overwhelmed today with cheap automatic devices and various "smart" appliances.

Prior knowledge is hardly needed for programming. It is sufficient to have a PC (software in use is not demanding at all and is easy to learn) and a simple device (called the programmer) used for "loading" ready-to-use programs into the microcontroller.

So, if you are infected with a virus called electronics, there is nothing left for you to do but to learn how to use and control its power? PIC microcontroller can be used as the brain to control a large variety of products, in order to control large devices. It is necessary to interface or connect them to the microcontroller.

## 2.3 Families of Microcontroller

The microcontroller field is very diverse. Hundreds of variations and architectures exist. A lot of them are task intensive. Here are some popular ones:

- Atmel - AT89, AT90, AT tiny, AT mega series, AT 91SAM, AVR32
- Xilinx - Micro blaze, Pico blaze
- NEC-17K,V25, 75X, 78K, V850
- Intel - MCs-48, MCS-51, 80960
- Microchip - PIC8, PIC 16, PIC32

Among beginners or hobbyists, the PIC series, from Microchip and AVR series from Atmel is most popular. As they are cheap and have a huge user base populating the internet.

## 2.4 Peripheral Interface Controller:

PIC is a family of Harvard architecture microcontrollers made by Microchip Technology, derived from the PIC 1640 originally developed by General Instrument's Microelectronics Division. The name PIC initially referred to "Peripheral Interface Controller". PICS arc popular with both Industrial developers and hobbyists alike due to their low cost, wide availability, large user base, extensive collection of application notes, availability of low cost or free development tools, and serial programming (and re-programming with flash memory) capability. Microchip announced on February 2008 the shipment of its six billionth PIC processor.

## 2.5 Advantage of PIC

There are some advantages of PIC are given below:

- It is a RISC (Reduced Instruction Set Computer) design . Only thirty seven instructions to remember.
- Its code is extremely efficient, allowing the PIC to run with typically less program memory than its larger competitors. It is low cost, high clock speed.

## 2.6 Arduino

Arduino is a computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board? To do So you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing. Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike. Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IOT applications, wearable, 3D printing, and embedded environments. All Arduino boards are completely open-source, empowering users to build them independently and cvcntually adapt them to their particular needs. The software, too, is open-source, and it is growing through thc contributions of users worldwide.

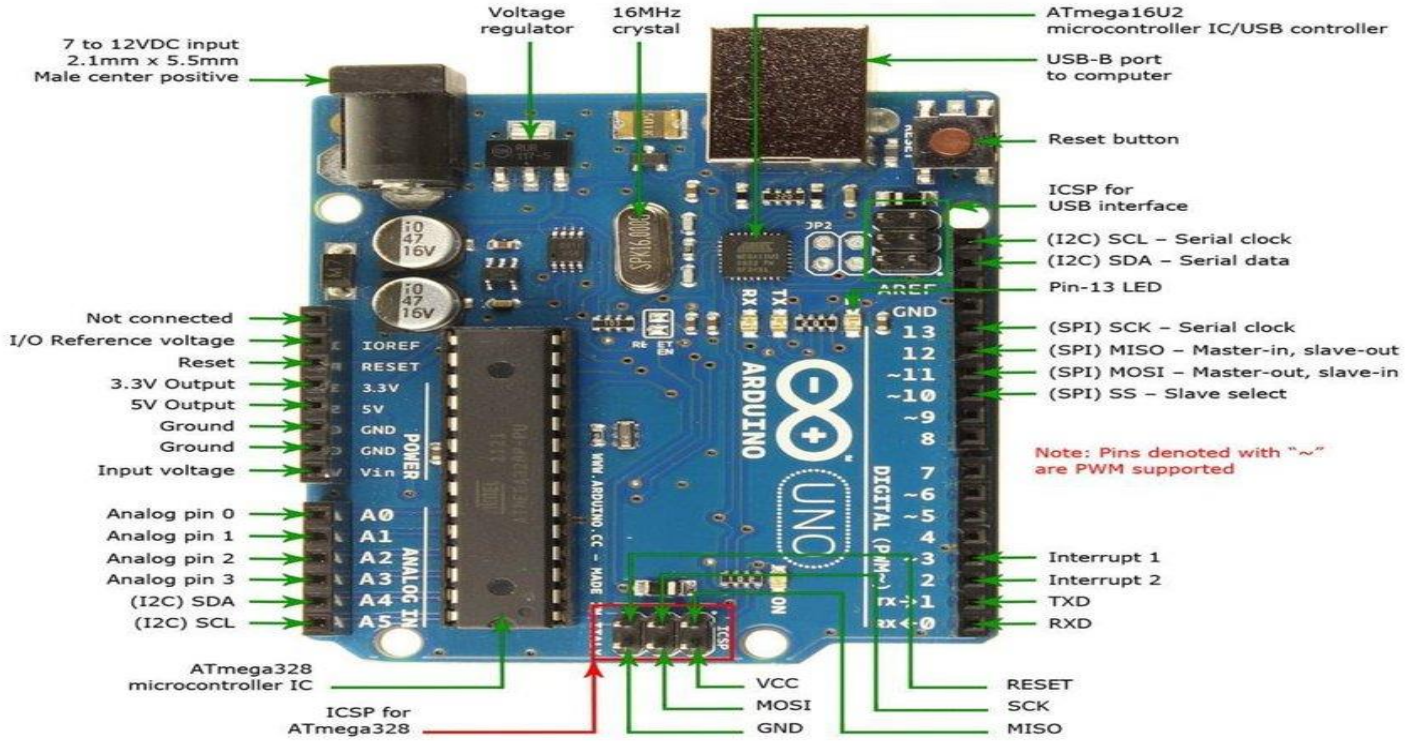



Figure 2.1 Arduino

## 2.7 Utilities of Arduino

Thanks to its simple and accessible user experience, Arduino has been used in thousands of different projects and applications. The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. It runs on Mac, Windows, and Linux. Teachers and students use it to build low cost scientific instruments, to prove chemistry and physics principles, or to get started with programming and robotics. Designers and architects build interactive prototypes, musicians and artists use it for installations and to experiment with new musical instruments. Makers, of course, use it to build many of the projects exhibited at the Maker Faire, for example. Arduino is a key tool to learn new things. Anyone - children, hobbyists, artists, programmers - can start tinkering just following the step by step instructions of a kit, or sharing ideas online with other members of the Arduino community.

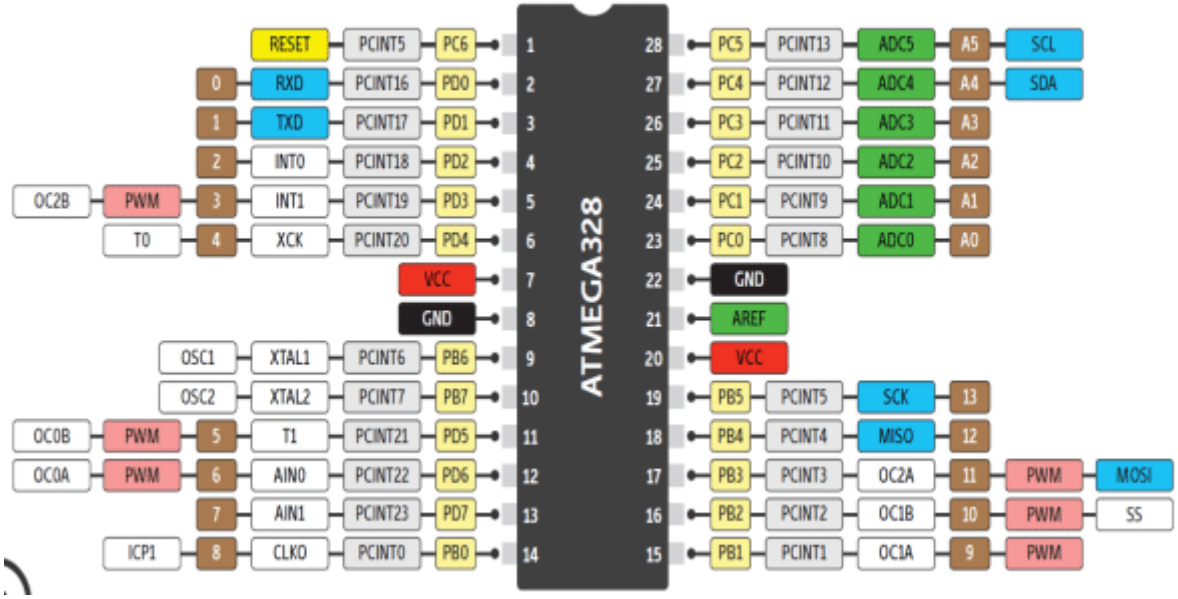



Fig 2.2ATMega 328 pinout

There are many other microcontrollers and microcontroller platforms available for physical computing. Parallax Basic Stamp, Net media's BX-24, Phi gets, MIT's Handy board, and many others offer similar functionality. All of these tools take the messy details of microcontroller programming and wrap it up in an easy-to-use package. Arduino also simplifies the process of working with microcontrollers, but it offers some advantage for teachers, students, and interested amateurs over other systems.

- Inexpensive - Arduino boards are relatively inexpensive compared to other microcontroller platforms. The least expensive version of the Arduino module can be assembled by hand, and even the pre-assembled Arduino modules cost less than $50

Cross-platform - The Arduino Software (IDE) runs on Windows, Macintosh OSX, and Linux

- Inexpensive - Arduino boards are relatively inexpensive compared to other microcontroller platforms. The least expensive version of the Arduino module can be assembled by hand, and even the pre-assembled Arduino modules cost less than $50

- Cross-platform - The Arduino Software (IDE) runs on Windows, Macintosh OSX, and Linux operating systems. Most microcontroller systems are limited to Windows.

simple, clear programming environment - Arduino Software (IDE) is easy-to-use

for beginners, yet flexible enough for advanced users to take advantage of as well. For teachers, it's conveniently based on the Processing programming environment, so students learning to program in that environment will be familiar with how the Arduino IDE works.

- Open source and extensible software - The Arduino software is published as open source tools, available for extension by experienced programmers. The language can be expanded through C++ libraries, and people wanting to understand the technical details can make the leap from Arduino to the AYR C programming language on which it's based. Similarly, you can add AVR-C code directly into your Arduino programs if you want to.
- Open source and extensible hardware - The plans of the Arduino boards are published under a Creative Commons license, so experienced circuit designers can make their own version of the module, extending it and improving it. Even relatively inexperienced users can build the breadboard version of the module in order to understand how it works and save money.

## 2.8 Android Application

There are many apps to control the Bluetooth communication with our smartphones. In our project we have used Arduino Voice controller application for controlling our project using our smart phone. It is available on the google play store.

Arduino voice Controller Application is to allow you to control various electrical devices by different ways. Use Android Bluetooth mobile device to remote control your device with Bluetooth Module and Arduino Board.

For Automation System, Voice control ,Car control, Smart Home Automation ,light control etc.

### 2.8.1 MAJOR FEATURES

1. TERMINAL which is used to send commands using keyboard.
2. ON/OFF Buttons which you can configure according to your need.
3. REMOTE controller to control cars related devices.
4. DIN'INIER is used to change brightness of lads or the speed of devices.
5. TIMER is used to set Time duration to ON / OFF the device and show the countdown timer.

2.8.2 OTHER FEATURES

l . You can sct the device as default so next timc App will connect with thc default dcvicc automatically.

2. You can Configure App according to your need i.e. the command you wanna send to Arduino board will bc according to your choice.

3. The Arduino microcontroller C/C-I-F SAMPLE codc is provided for each feature which you can check it in cach MENU in App.

# 2.9 Relay switch

Arduino can provide and control voltage of maximum 5V but an AC load is connected to 220V. As Arduino cannot control this high voltage, a relay module has been used here. Relay is a kind of switch which can control a higher voltage using a lower voltage. The lower voltage is used as binary signal input and the higher voltage as the binary output.

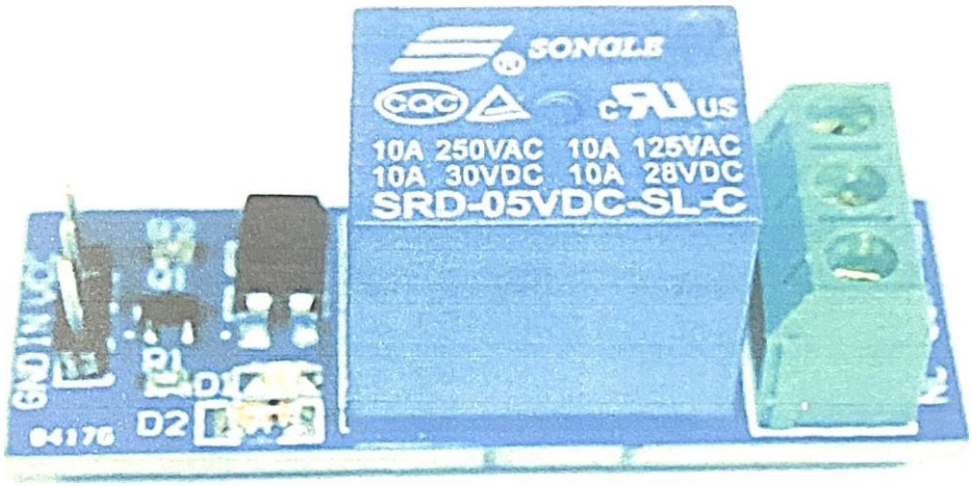



Fig 2.3 relay switches

There are three output pin in a relay module:

1. NO
2. COM
3. NC

COM = Common connection: It is the center terminal.

NO Normally Open connection: It acts like a switch. since it is open. Normally there is no contace between COM and NO, when we trigger the relay module, it connects to COM by the electro magnet inside the relay and supply to the load is provided, which powers up the light. Thus the circuit is closed until we trigger the static to low in relay. NC = Normally Closed connection: It is always connected to COM, even when relay is not powered. When we trigger the relay it opens the circuit, so the connection is lost. It behaves just opposite to NO.

HereNO connection is used, but in this type of relay "HIGH" static of INPUT pin turns off the relay (opens the circuit). "LOW" state of INPUT pin turns on the relay.

2.9.1 Input of relay:

Arduino 5V to relay VCC

Arduino GND to relay GND

Arduino digital pin 2 to Relay INPUT I (Any other digital pin can be used)

Arduino digital pin 3 to Relay INPUT 2 (Any other digital pin can be used)

Arduino digital pin 4 to Relay INPUT 3 Arduino digital pin 5 to

Relay INPUT 4

2.9.2 Output of relay:

1. NO - connected to AC load in series
2. COM - the supply line to AC light
3. NC - Not connected to the line

## 2.10 Bluetooth Module

HC-05 Bluetooth Module is an easy to use Bluetooth SPP (Serial port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth

V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4 GHz radio transceiver and baseband. It uses CSR Blue core 04-External single chip Bluetooth system with CMOS technology and with AFH (adaptive Frequency Hopping Feature).lt has the footprint as well as 12.7mmx27mm. I-IC-05 Bluetooth module provides switching mode between master and slave mode which means it able to use neither receiving nor transmitting data.

Specification:

* Module: llC-05

* Input Voltage: DC 5V

*Communication Method: Serial Communication * Master and slave

mode can be switched * Typical -80dBm sensitivity A.

* Up to +4d13m RF transmit power

*PIO control

*UART interface with programmable baud rate

* With integrated antenna

* With edge connector

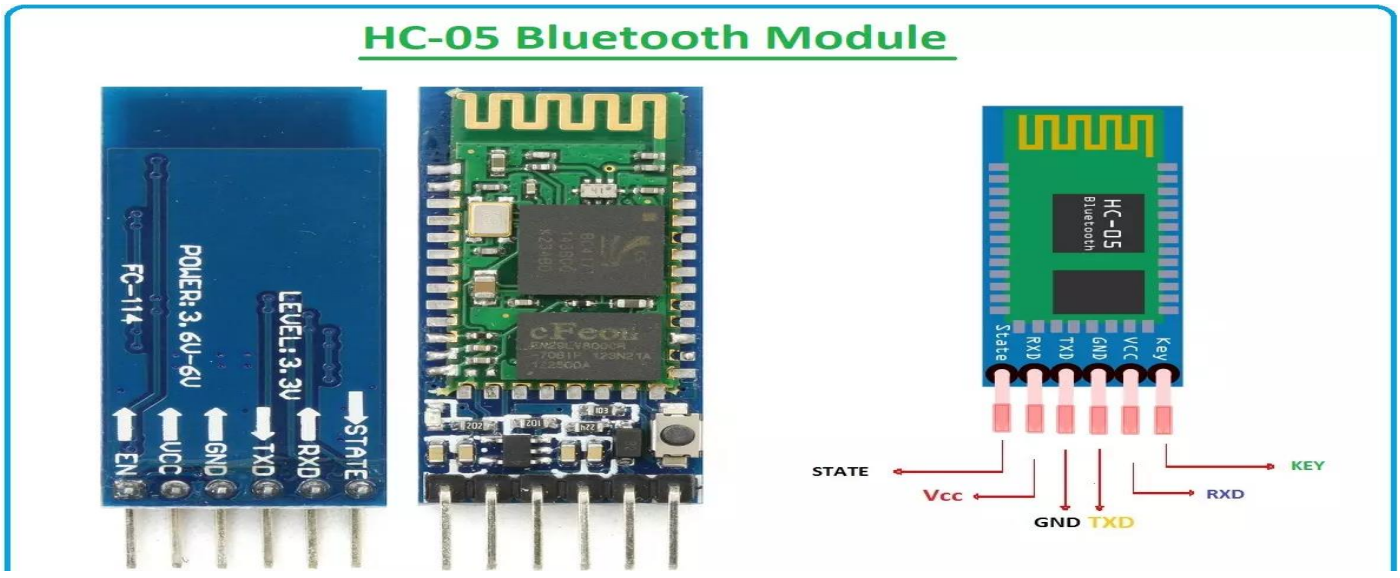



Fig 2.9 HC-05 Bluetooth Module

The Bluetooth protocol operates at 2.4GHz in the same unlicensed ISM frequency band where RF protocols like ZigBee and Wi-Fi also exist. Every single Bluetooth device has a unique 48-bit address, commonly abbreviated BD ADDR. This will usually be presented in the form of a 12-digit hexadecimal value. The most-significant half (24 bits) of the address is an organization unique identifier (OUI), which identifies the manufacturer. The lower 24-bits are the more unique part of the address.

This address should be visible on most Bluetooth devices. For example, on this RN-42 Bluetooth Module, the address printed next to "MAC NO." is JDY-30 14:41:05:07:0D:B1 the module. Every RN module will share those upper 24-bits. The "422152" portion of the module is the more unique ID of the device.

# CHAPTER 3
# DESIGN AND DEVELOPMENT

## 31 Hardwar Design:

Home Automation systems uses Arduino cabled Laptop or pc for its application and the Arduino Uno as the Microcontroller, The key components of this system arc:

For implementing our desired Home automation system, the following equipment's are used.

## 3.2 Components:

1. Arduino UNO
2. Bluetooth Module
3. Relay
4. Motor build holder
5. Bulb
6. Connecting wire
7. Power supply

## 3.3Tools:

- Glue gum
- Wire Stripper
- Pliers
- Laptop

3.4 Block Diagram:

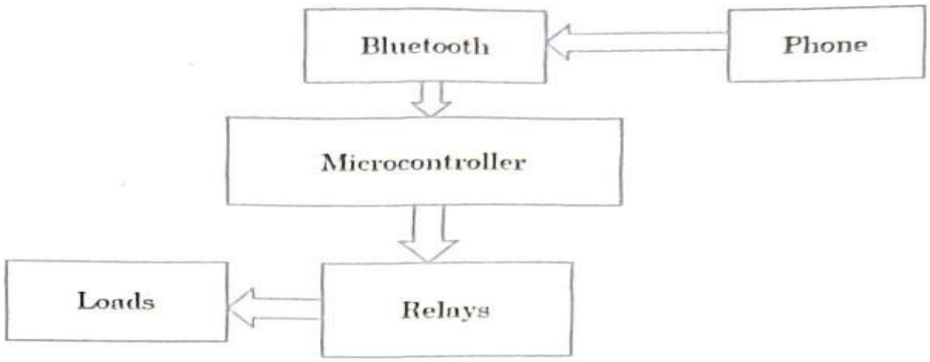



Fig 3.1 Flow chart of our system

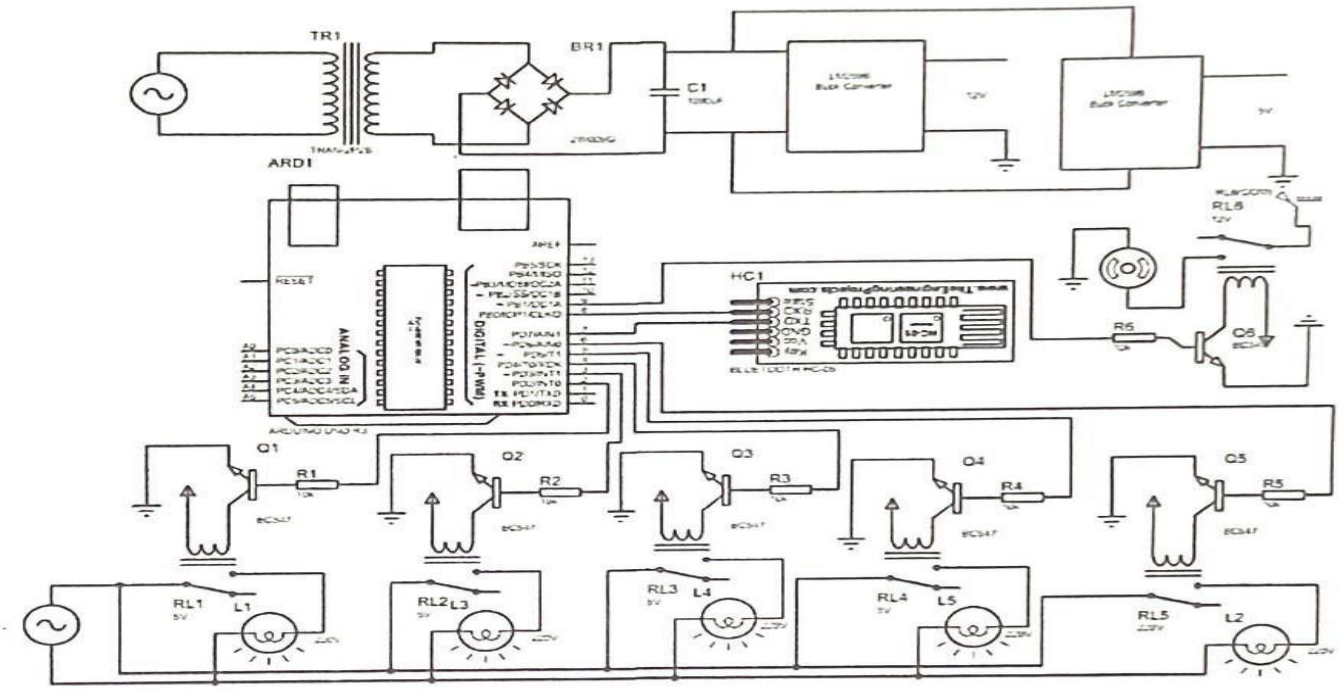



Fig 3.2 Circuit Diagram of our system

This project is basically based on both the android and Arduino Uno AT mcga 328. In this experiment we control our

ardunio uno by using the Bluetooth of the android smart phone. Inorder to communicate with the Arduino, android need an interface. By using this interface, android sends the text commands to Arduino. In this project we have designed a room with the help of Arduino microcontroller. \l-lcre we have also used apps which are controlled through android smart phone.

In our project the room contains light, fan, AC and TV. Here we have tried to control all this things using Arduino along with the help of Bluetooth module I-IC-05.

In our project we have used used Arduino Voice control apps which available in the Google play store.

### 3.5 Software Design

proteus VSM for AVR@ contains everything you need to develop, test and virtually prototype your embedded system designs based around the Atmel@ AVR@ series Of microcontrollers. The unique nature of schematic based microcontroller simulation with Proteus facilitates rapid, flexible and parallel development of both the system hardware and the system firmware. This design synergy allows engineers to evolve their projects more quickly, empowering them with the flexibility to make hardware or firmware changes at will and reducing the time to market.

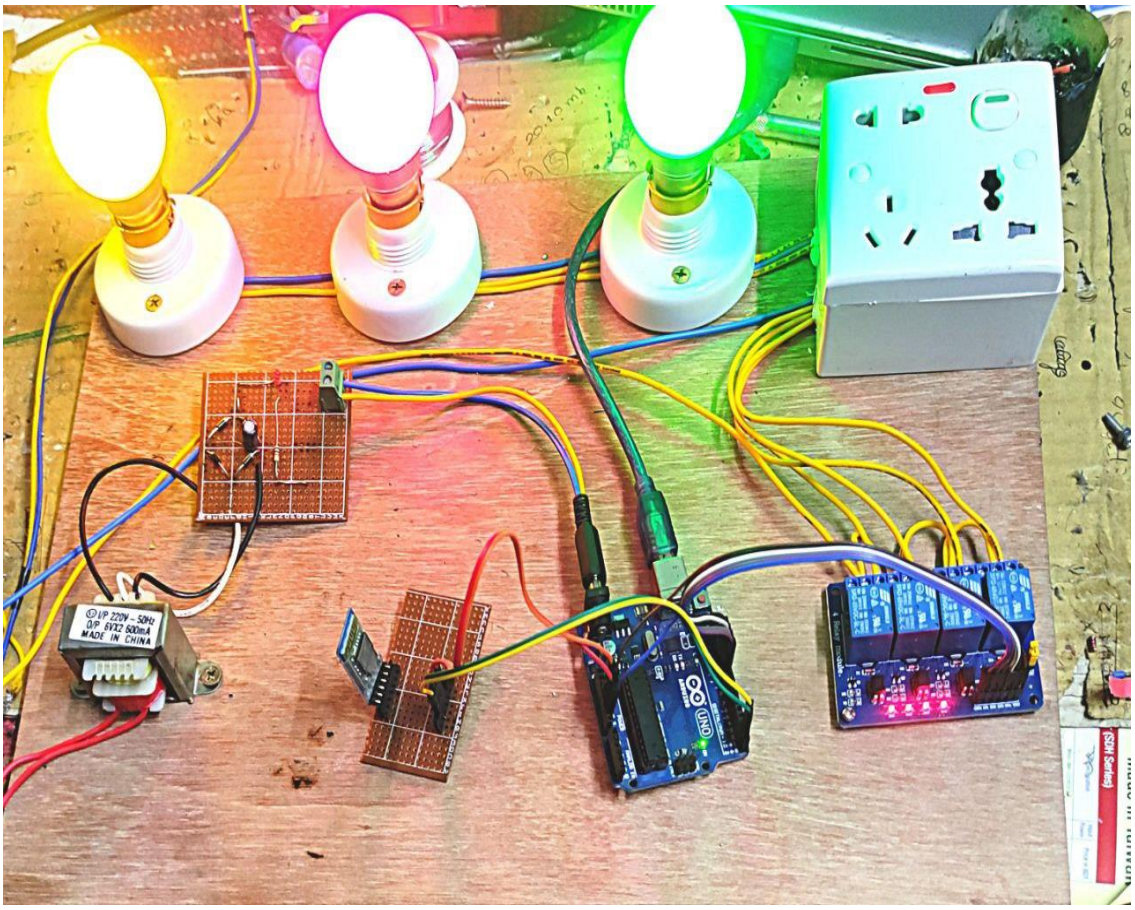
# CHAPTER 4

# DISCUSSION

## 4.1 Testing:

The Bluetooth based HOME Automation System has been designed and tested with the Mobile Bluetooth. This system us we control 4 switch via Bluetooth .

## 4.2 Project pictures:



## 4.3 Result

### 4.3.1 Light

When I send "Motor on" via phone then Relay goes to on. When I send "Fan off then Relay turn off

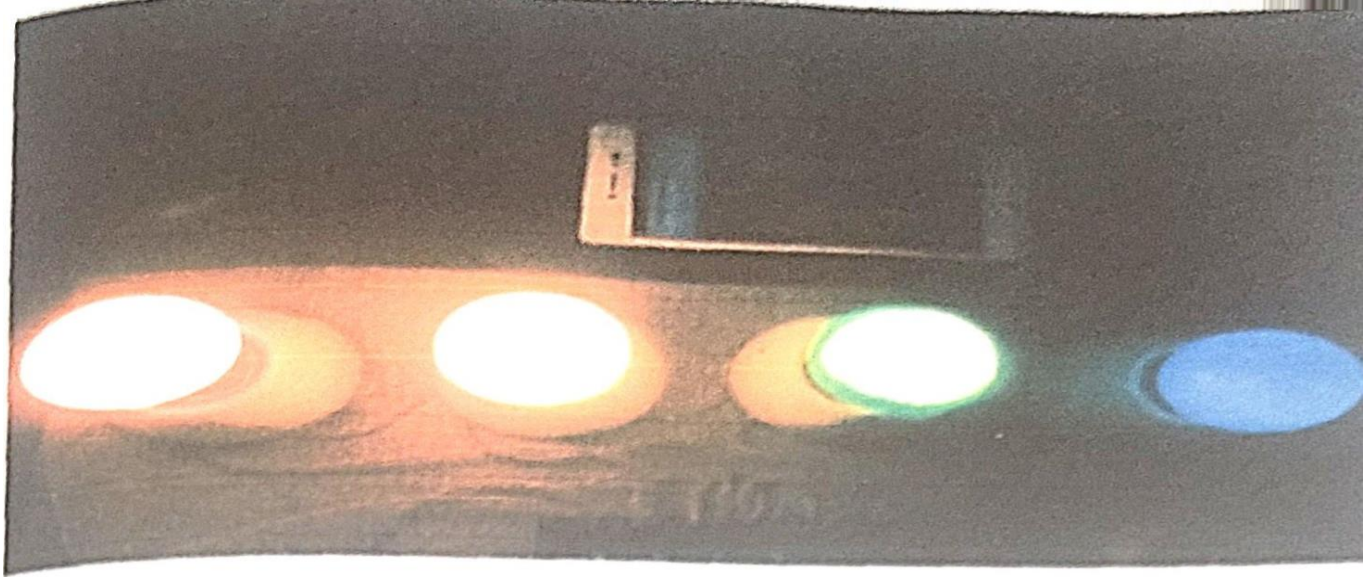


Fig 4.1 light

### 4.2.2 Motor

- When I send "Motor on/" via phone then Relay go to on. When I send "Fan off then turn off

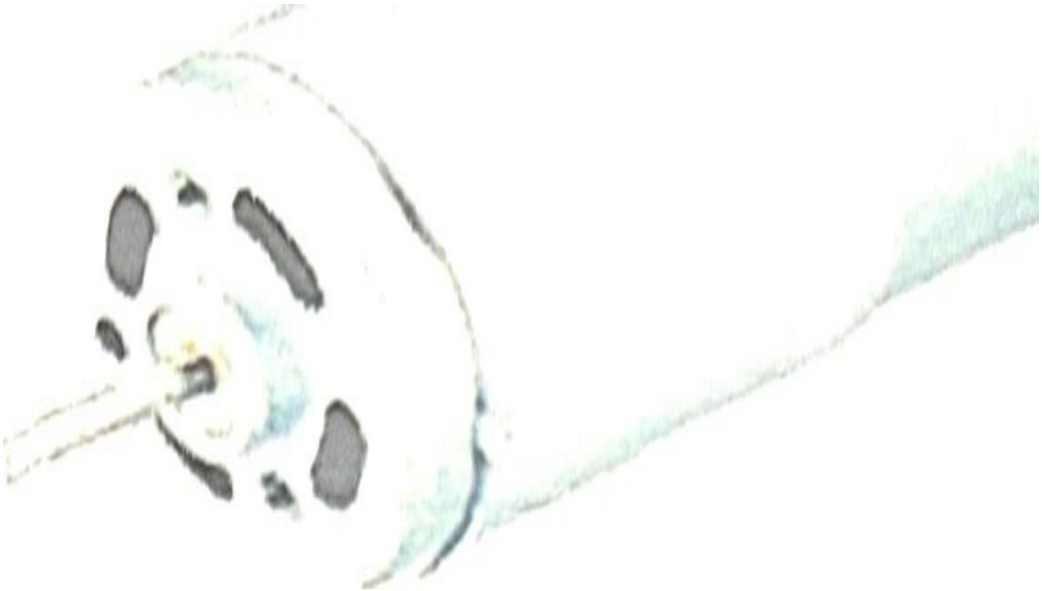


Fig: 4.2 DC Motor

### 4.2.3 Phone charger

When I send "Phone charge on" via phone then Relay goes to on. When I send BAC Relay turn off.



## 4.3 Discussion

The Home Automation System (I-IAS) was developed using Java Me [14] and MO Sync [15] during the course of research and now a User Interfaced (UI) Android Application program implemented on an Android based Bluetooth enabled mobile phone, and an 8-bit microcontroller based relay driver circuit with Serial Bluetooth Module, which is able to communicate with the Home-Appliances over Bluetooth link. The system is based on serial data transmission using Bluetooth wireless communication in order to facilitate the appliances control in a HAS.

This system ensures a secured exchange of data on wireless communication. It also supports conventional ON/OFF system of appliances. A user interface (UI) on the Android enabled mobile phone offers system connection and control utilities. ULN 2803 relay driver [16] and serial Bluetooth Module from TINY OS [17] as well as Television DE [IS] for compiling C Language Code and unflashy+ programmer [19] for burning HEX file into microcontroller were used for the development. An ATMEL 1549, S-bit microcontroller [20] was used as an embedded relay controller.

# CHAPTER 5 CONCLUSION

**5.1** Future Works to our days, alternative designs have been developed which support sornc of the propogcd Automation services, as it prcscntcd in detail, Some of' thcm arc dcvclopcd in J Iornc systcrn scctor, while somc other comes from the rcscarch community and acadcmia. In most orthc cascg, ems from Home support a number or scrviccs. Thcsc usually orrcr a rcliablc rcmotc control of stem via a mobile device, support services ror all day long, or a fricndly intcrfacc dcsigncd be used by all I-Iome residents. On the other hand,

to many systems coming mainly from research groups, offer a part of these facilities at lower cost, gencrally. For example, if a uscr does not have the ability to control the alarm systcm through a mobilc application, this decreases the total system cost at a great value. Another point of comparison, bctwccn all the Automation systems is their scalability. Some of these systems do not allow the users to add any additional sensors or coding functions, or even to change the operations source code. The proposed system design is fixed, in sense of operation modes, when it is fully integrated. On the other hand, in open systems, the user has the option to install, to add, to change or to modify operation modes on demand, which increase their complexity.

**5 2** Automation has attracted the interest of the research community during the last decode, at a great manner. Horne Automation systems consist n constantly, year after year, developing research field. Sine oc these systems orc limited to support basic operation, while c others satisfy a range of additional print)attics. In thig paper, a gystcrn for smart Ilorin automation is proposed. The introduced system operation ig supported by a Bluetooth embedded system, the proposed system is implemented on a microcontroller module, through an embedded platform. System's operation is also based on Mobile Phone via Bluetooth. Our diligence Ifeoma automation system provides a lot of advantages. Some often arc given below:

- To design Home Automation system that can be controlled by mobile phone through Bluetooth.
- That can be controlled within a reasonable range like outside of Ilic when room is locked.
- Its cost will be low and easily maintainable and user friendly.
- Although Automation is a vital point for any system and in this case our system is more reliable and more secured, but sometimes to overcome some problem it is will be necessary to use a system by any one. But this device can't be connected by unknown person. So it may be problematic some time.
- This system may be more useful and more practical but our device can't operate far away. So it is worse limitation of our designed system.

## References:


Ill Anitra Sasmal, Abhradccp palit, Abhishck Majurndcr, Dccpjoyti Bhowmik, Sougata Chanda, depicted Home Automation system considering notification system to notify uscr accordingly used toast notification and putting status mcssagc on status display.

[2] Ms. Jaya srce depicted thc way to usc various softwarc rcquircd for manufacturing and working of system. For cxamplc, Exprcss PCB is for designing circuit, kcil compilcr for compilation part protcus7 for simulation part.

[31 R.A. Ramie , M.I-I. Leong, R.S.S. Singh, M.M. Ismail, M.M. Othman, J-I.A. Sulaiman, M.I-I. Misran, M. A. Mcor well cxplaincd thrcc diffcrcnt types of phisical control method namely pressing on the modified low voltage activating switch, clccking on window GUI on PC/Loptop, andoid GUI installed in smart phone.

[4] Sycd Husain, Naqvi Raza Introduced The Concept Of I-Iomatic Worid In Which Homatic Is Represented as aWirclcss I-Iome Automation and makes Life casicr .The used single core prosessor Whice operates on gingerbread operating system.

[51 Baris Yuksekkaya, a.AlparKayalar, M. Bilgehan Tosum ,M. KannOzcan, and Ali Zahalka,"A GSM, Internet And Spaeech controlled wireless Internet Home Automation System" A GSM, IEEE transaction on Consumer Electronics, VOI.52 NO.3 AUGUST 2006.

[61 N. Srikanth and Tan Karanda, " Bluetooth Based Home Automation Systems", Journal of Microprocessor and Microsystems, 2002, Vol.26,pp 281-289.

[71 Kwang Yell Lee & Jae won Choi, Remote controlled Home Automation systems via Bluetooth Home Network " In SICE Annual Conference in Fukui,2003, Vol,3 ,pp. 28242829.

[81 Serial Bluetooth Module, Tiny OS Electronics, http://www.tinyosshop.com/index.php?route=product/product&productid=330, 2003.

[91 uCFlashprogrammer, UC Micro Systems, http://www.ucmicrosys.com/products/ic-programmers/ucflash.html, last seen on April,2013.

[101 AT89c51 8 bit Microcontroller, ATMEL corporations, http://www.atmel.com/images/doc0265.pdf last seen on October 2013.

## PROGRAM CODE

```
Software Serial Bluetooth (7,8);//RX,TX
String voice; char c; int relay1=2; int rclay2=3; int relay3=4; int relay4=5; Char commanbool statel=l; bool state2=1;
char data = 0;
void setup()
{Serial.begin(9600);
pinMode(10, OUTPUT);
pinMode(11, OUTPUT);
pinMode(12, OUTPUT);
pinMode(13, OUTPUT);}
void loop()
{
if(Serial.available() > 0)
{
data = Serial.read();
Serial.print(data);
Serial.print("\n");
if(data == 'a')
digitalWrite(10, HIGH);
else if(data == 'b')
digitalWrite(10, LOW);
 if(data == 'c')
digitalWrite(11, HIGH);
else if(data == 'd')
digitalWrite(11, LOW);
if(data == 'e')
digitalWrite(12, HIGH);
else if(data == 'f')
digitalWrite(12, LOW);
if(data == 'g')
digitalWrite(13, HIGH);
else if(data == 'h')
digitalWrite(13, LOW);
}
```

---

```
}
```