Mini Project Report on

TITLE

Submitted in partial fulfillment of the requirement for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE & ENGINEERING

Submitted by:

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January 2023

CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the project report entitled **"SMART HOME APPLICATIONS"** in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science and Engineering of the Graphic Era (Deemed to be University), Dehradun shall be carried out by the under the mentorship of **DR PRIYA MATTA,** Department of Computer Science and Engineering, Graphic Era (Deemed to be University), Dehradun.

Signature

NAME – MAYANK RAI **University Roll No – 2019682**

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Chapter 1

INTRODUCTION

In the following of my Mini Project I have described my ideas on the topic '**SMART HOME APPLICATIONS'**

1.1 What is smart home applications ?

We already know that the Home Automation is an exciting way to interact with our home environment and we can attain higher level of relaxation and convenience with the help of IOT . We can keep an eye on lots of product who follow IOT principle and make our work easier ex- SMART WATCHES , SMART DOOR LOCKER , SMART SPEAKERS , SMART CAMERAS , SMART LED LIGHTS .

1.2 Features

Now let's talk about some features of HOME AUTOMATION . In the digital world, connectivity is the key to functionality. Smart home technologies do not just make humans job simple, but also address critical issues like global warming, climate change and renewable energy by automating energy consumption process.

1.2.1 Smart Energy Consumption

Having a smart system that monitors and optimizes energy consumption has a range of benefits. Not only does it add sustainability to your regular consumption, but its efficient modelling will also help you cut down on energy costs. It is the perfect solution for you and the environment!

1.2.2 Security Systems

You need to have a fully automated security system in your smart home to boost your safety and get timely alerts for suspicious activity, even when you are away from home. It will help you notify the respective authority to ensure your house and family members remain safe.

1.2.3 Temperature control

With temperature control automation, you can adjust the home temperature to the level that suits you best. Smart thermostats control the temperature based on configurations set by users in accordance with their preferences. These controllers can check your current activity and change the temperature accordingly.

For instance, users can configure the app so that when they take a bath or a shower, the temperature would automatically go up. If they decide to work out, practice yoga, pilates, or any other physical activity at home, the temperature will decrease to help keep them cool.

1.2.4 Face Recognition

With temperature control automation, you can adjust the home temperature to the level that suits you best. Smart thermostats control the temperature based on configurations set by users in accordance with their preferences. These controllers can check your current activity and change the temperature accordingly.

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1.2.5 Home Automation

Finally, your smart home is incomplete without home automation. HOME AUTOMATION allows you to control entertainment, lighting, electrical appliances, etc. remotely, to help you add efficiency to your schedule. Your system will shut off lights at night, so you don't have to worry about wasting energy.

FIG – 1.1 Home automation description

You can automate your system and program it to follow your preferred routines. As a result, you will find yourself waking up to a hot cup of coffee, have warm water ready for showering, and listen to the news while you get ready for work.

1.3 APPS that follow IOT for smart home applications

As it turns out, it can with a smart home app!

Now we don't even have to move in order to grab the remote and change the channel. All we have to do is to talk to our TV, and it will change the channel itself. And it's not only limited to the television system. From kitchen appliances to the garage door, from the lights to the curtains, everything can be controlled. Thanks to the smart home technologies coupled with smart mobile app development that is making it easier for normal users.

Of course, smart home technology has advanced a lot further in such a short amount of time. Available for both ANDROID and iOS, a home automation system enables you to control every aspect of your home. With just a tap on your phone, even when you are not there. In this scenario, the smart-home mobile automation apps turn the smartphone into a remote.

And that's how you can begin your smart home automation journey.

1.3.1 AMAZON ALEXA

Fig 1.2 Alexa

Amazon's innovation has led them to be one of the leading brands when it comes to home automation. If you have Alexa, then the app is going to be useful. The Amazon Alexa app is one of the best apps you could use for home automation.

The Amazon Alexa app is compatible with a wide range of smart devices. This is due to many companies wanting compatibility with the Amazon Alexa brand.

1.1.1 Google Assistant

Fig 1.3 Google Assistant

Google Assistant is Google's voice assistant. Originally, Google Now smartly pulled out relevant information for you. It knew where you worked, your meetings and travel plans, the sports teams you liked, and what interested you so that it could present you with information that mattered to you. Google Assistant offers voice commands, voice searching, and voice activated device control, letting you complete a number of tasks after you've said the "OK Google" or "Hey Google" wake words. It is designed to give you conversational interactions.

1.1.2 Google Home App

Fig 1.3 Google Home

The Google Home app is the easiest way to control many smart devices, allowing you to operate them without using any other software. What's particularly convenient is that all the devices you use with Assistant automatically appear in the app without needing extra configuration. There's no need to manually add each device to the app, and you can control them all from one screen.

1.1.1 Apple Siri

Fig 1.4 Apple Siri

Siri is Apple's smart assistant across all of its platforms. It uses machine learning to determine suggestions for users, answer queries, or control devices. Users can configure it to speak with multiple voices across several languages.

1.1.2 Smart Home Manager

Fig 1.5 Smart Home Manager

This free tool makes managing your AT & T home internet easy. It provides a personalized method of controlling your home network from your smartphone, tablet or computer. You will be able to manage your account in addition to other detailed information about your internet like you never have before with this convenient app. Have total control right beneath your fingertips with the AT&T Smart Home Manager app.

1.2 NEED OF SMART HOME APPLICATION

→ Home automation is constructing automation for a domestic, mentioned as a sensible home or smart house. In the IO Thome automation ecosystem, you can control your devices like light, fan, TV, etc.
→ A domestic automation system can monitor and/or manage home attributes adore lighting, climate, enjoyment systems, and appliances. It is very helpful to control your home devices.
→ It's going to in addition incorporates domestic security such as access management and alarm systems. Once it coupled with the internet, domestic gadgets are a very important constituent of the Internet of Things.

→ A domestic automation system usually connects controlled devices to a central hub or gateway.
→ The program for control of the system makes use of both wall-mounted terminals, tablet or desktop computers, a smartphone application, or an online interface that may even be approachable off-site through the Internet.

Chapter 2

LITERATURE SURVEY

2.1 Introduction to the survey

In this introduction to survey we are going to discuss the various types of RESEARCHES made by teachers from various universities in INDIA and from various authors . we are going to learn the different ideas and researches made by them to understand our topic SMART HOME APPLICATIONS.

2.2 Survey on smart home application using Arduino (set)

Now we start discussing the different types of surveys

2.2.1 ABSTRACT

Internet of things (IoT) is an emerging technology today that envisions all objects around us as a part of Internet. Automation of the devices, appliances at home and office is having extensive possibility of research with the innovation of technology in communication.

Technology plays an anchor role in making our homes more automated and hence more convenient. This research objective is to design and implement a cost effective but yet flexible, adaptive and secured Home automation system.

The article discusses different challenges and key issues of IoT, architecture and important application domains. Also, the article bring into light the existing literature and illustrated their contribution in different aspects of IoT.

KEYWORDS - Arduino uno , IOT , Smart phones , IOT based appliances , Bluetooth module.

2.2.2 INTRODUCTION

The main attraction of any automated system is reducing human labor, effort and time. home automation aims at automating the human lives. activating the home appliances without conventional switch but by using a smart phone is known as home automation. There are several IOT systems which can be easily used for home automation based as well as industrial automation based. Generally the applications of IOT devices are divided according to their use in several sectors. There is numerous IOT application used in consumer sector.

IoT includes variety of objects like smart phones, tablets, digital cameras and different sensors. When all these devices are connected together, they enable additional smart processes and services that support our basic needs, environment and health . We can also control the home appliances by two methods by voice commands or by using android mobile as a remote controller. The voice recognition is done by the google assistant and thus given to the controller to control the devices. .

2.2.3 COMPONENTS REQUIRED

2.2.3.1 Arduino uno –

Arduino UNO is a microcontroller board based on the **ATmega328P**. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB

cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

Fig 2.1 Arduino Uno Borad

2.2.3.2 Relay Modules –

A power relay module is **an electrical switch that is operated by an electromagnet**. The electromagnet is activated by a separate low-power signal from a micro controller. When activated, the electromagnet pulls to either open or close an electrical circuit.

Fig 2.2 Relay Module

2.2.3.3 Bluetooth HC-05 –

Ever wanted to control your Mechanical Bots with an Android Phone or design the robots with custom remote, here in this tutorial we will learn about a Bluetooth Module HC-05 used for the above mentioned and many other cases. Here we will be understanding the connection and working of a HC-05 module and also its interfacing with custom android app.

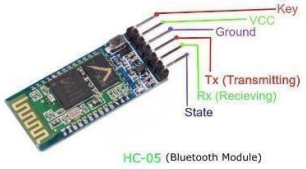


Fig 2.3 Bluetooth HC-05

2.2.3.4 Wires , and extra appliances

Fig 2.4 Wires

Fig 2.5 Board

Fig 2.6 Bulb

Fig 2.7 Laptop

Fig 2.8 USB Cable

2.2.4 SOFTWARE REQUIRED

2.2.4.1 Arduino IDE

The Arduino Software (IDE) makes it easy to write code and upload it to the board offline. We recommend it for users with poor or no internet connection. This software can be used with any Arduino board. The Arduino Interactive Developer Infrastructure is a cross platform software for Microsoft, mac, and Linus that uses C and C++ functions. It's used to write and publish applications for Arduino-compatible devices, as well as additional vendor development boards that have third-party core support.

2.2.4 Features

→The project will have an android application in the user's android device. This application is designed to receive the voice commands from the user and automatically.
→Using IOT devices the user can save the valuable time. Using such IOT devices it avoids the user to do the same jobs frequently.
→Optimum use of energy and resources can be obtained. It is possible to adopt this technology. For this it is necessary to keep the devices under observation.
→All AI based applications are efficient to formulate our daily life better. Such devices are applicable to improve our comfort, convenience and better management.
→A preset program could monitor opening & closing of windows & shades according to position of sun & wind flow to regulate temperature, humidity & fresh air inside house.

2.2.5 Circuit Design

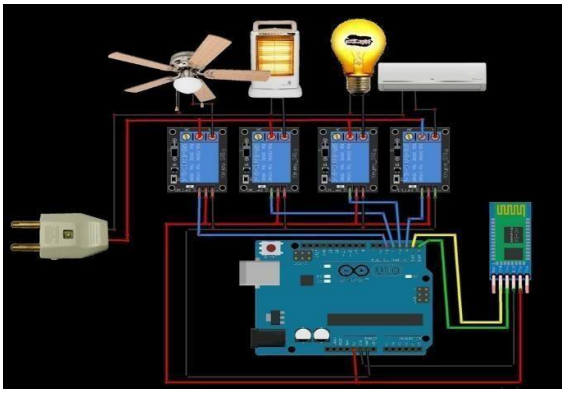


Fig 2.5 Circuit Diagram

2.2.6 DISCUSSION

Smart home technology allows homeowners to control smart devices with a cellphone or other networked device, providing security, comfort, flexibility, and cost savings. Smart home systems and devices that are parts of the Internet of Things (IoT) often collaborate, sharing customer use data and automated actions based on the choices of the residents. IoT technology has great impact in everyone's everyday life. This survey describes various methodologies used in home automation system to control and access the home appliances remotely through Internet services anywhere anytime. These devices also learn from the behaviors of their users and modify settings automatically to provide the best possible comfort and efficiency to their occupants. Smart thermostats may also measure energy use and alert users when filters need to be replaced, among other things. A higher level of energy efficacy Based on how you utilize smarter-home technology, you may make your home more energy efficient. The appliance's performance has been enhanced. Intelligent houses may also help your devices run more efficiently. A smart TV will aid you in discovering new apps and channels to watch your favorite programs.

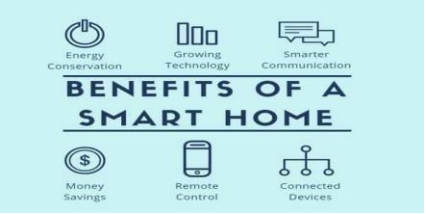


Fig 2.6 Overview image of Smart Home Applications

2.2.7 CONCLUSION

The purpose of making the SMART HOME APPLICATIONS is to reduce the burden of physically active work because now a days the life in the multinational cities of the country in quite busy and everyone wants to do the work with the help of ARTIFICIAL INTELLINGENCE to reduce the extra work of home so that they can peacefully complete their official work without any disturbance. It also is an important aspect in the present world where people are so busy, this would help them in easing the basic functionality of their life. The world around us is going digital in every aspect we can imagine and it is happening fast, we also need to move forward with it. Our system is a great initiative step in automation, it would also provide with security. Survey of different home automation system shows that there are several types of technologies used to implement this type of system . This system mainly help the people to operate their house appliances with the help of their mobile phones with help of different types of appliances ex – ARDUINO UNO etc. The system is requires less cost and is very flexible. It also provides security to the system. Finally it makes home as “SMART HOME APPLICATIONS”.

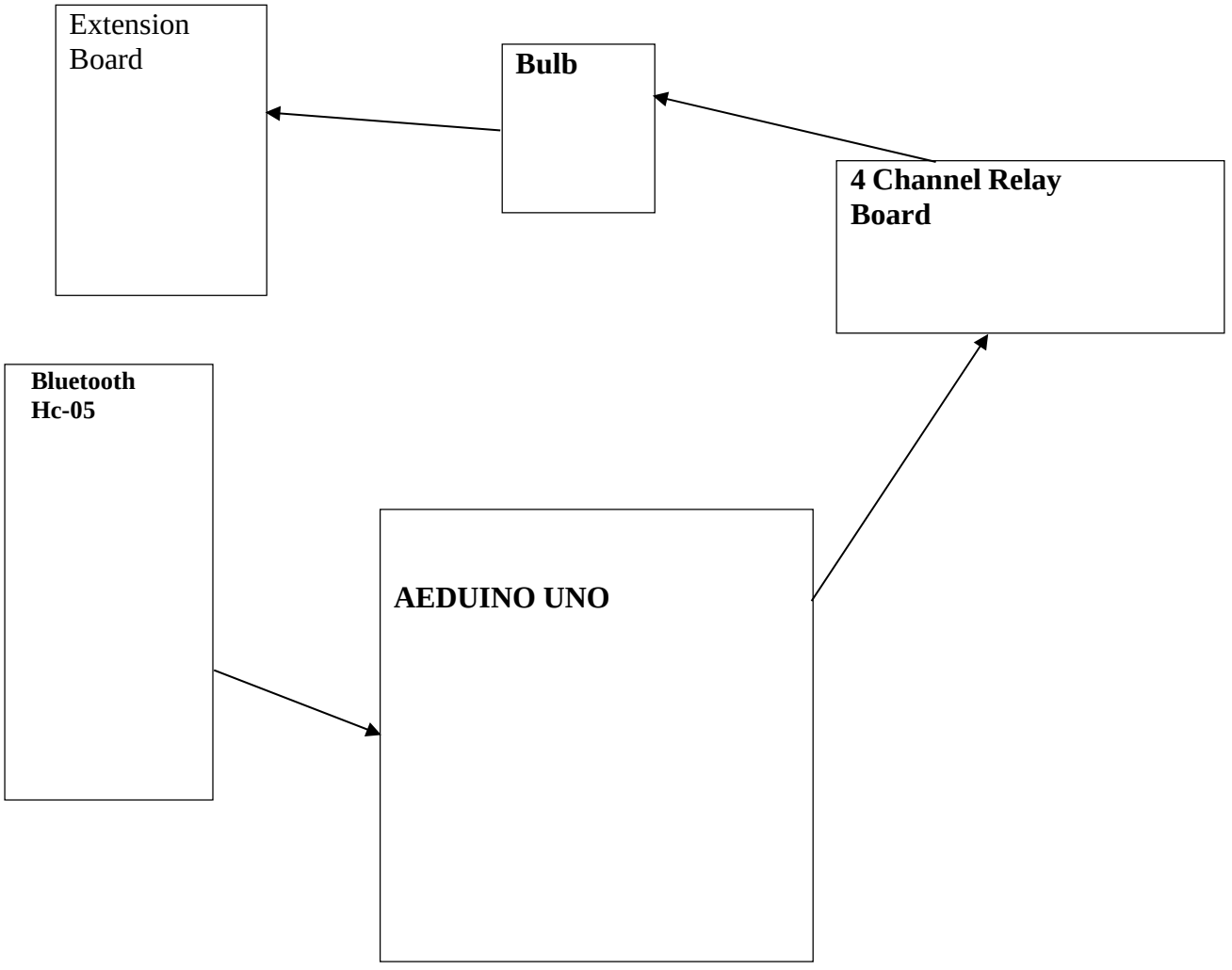
Chapter 3

METHODOLOGY

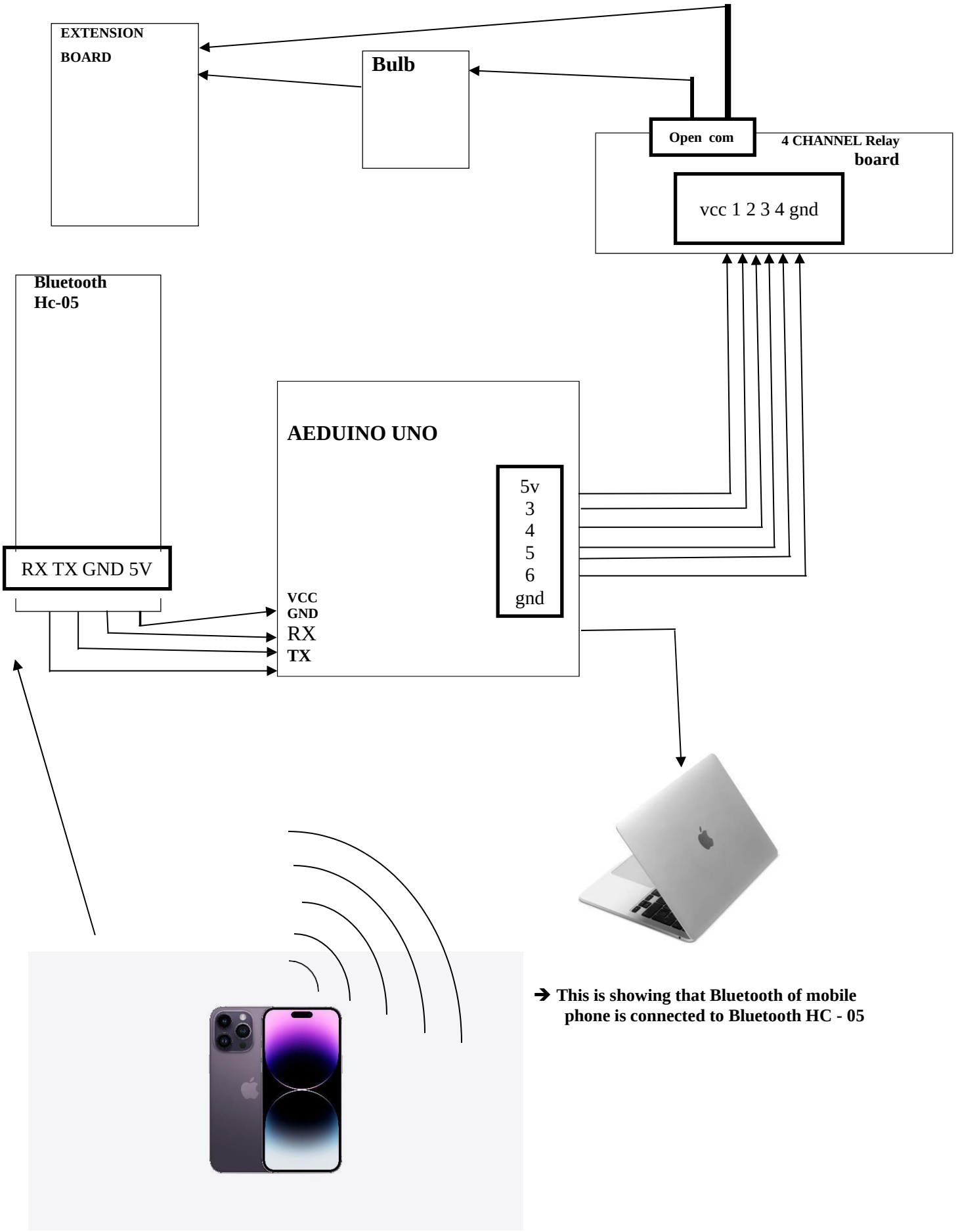
3.1 OVERVIEW

First of all I want to give the overview what I have done in my mini project named – SMART HOME APPLICATIONS . I have completed my mini project by operating smart home appliances using ARDUINO UNO BOARD , BLUETOOTH HC – 05 , 4 CHANNEL RELAY BOARD , MALE AND FEMALE JUMPER WIRES , LAPTOP , CODE (programmed in c , c ++ language) , USB Cable wire , BULB , EXTENSION BOARD etc . I have made the circuit in such a way that the circuit has no error and no error in the programming code . I have made the connection which I am going to show below in my methodology and i also used ARDUINO IDE software to program my code and put it in my Bluetooth module and after that I connected that Bluetooth with my mobile phone and download a certain application which allows to connect my mobile phone with Bluetooth module. After that with the help of that application I make my home appliances connect with my mobile phone and worked smartly in such a way that when I on the switch in the mobile phone the appliance which is connected to phone will become on and vice-versa

3.2 FLOWCHART OF PROCESS



3.2 CIRCUIT DIAGRAM OF PROCESS



➔ **This is showing that Bluetooth of mobile phone is connected to Bluetooth HC - 05**

3.4 ARDUINO IDE SOFTWARE FOR PROGRAMMING

Fig 3.1 Screenshot of successfully compilation of my code on ARDUINO IDE SOFTWARE

3.4 STEPS

STEP 1 – First I download ARDUINO IDE software in my laptop and run my code and then I connect my Arduino uno board with my laptop and upload that code inside it.

STEP – 2 now I take 4 wires and connect the RX , TX , GND , 5V of Bluetooth HC-05 with TX , RX , GND , Vin of ARDUINO UNO board.

STEP – 3 after that I take 6 wires and connect VCC , GND , In1 , In2 , In3, In4 of RELAY board to 5v , GND , 3 , 4, 5 , 6 column of the Arduino board.

STEP – 4 Connect the Arduino to power supply.

STEP – 5 Now we make the connection of the bulb by applying the wire on the OPEN SOURCE of the relay and connect one wire of bulb to the COMMON SOURCE of the RELAY board.

STEP – 6 After that I connect the one wire from source part of the relay an done wire from the bulb to the extension board for the power supply.

STEP – 7 Now i downloaded the android application in my mobile phone connect my Bluetooth hc - 05 .

STEP -8 You can see that your appliance start working with your phone .

STEP – 9 You can control your home appliances with your mobile by switching onn/off.

STEP – 10 In this way I made my mini project – SMART HOME APPLICATIONS .

Chapter 4

RESULT AND DISCUSSION

4.1 RESULT OVERVIEW

In the Result we clearly see that the when i successfully connect the circuit with help of diagram I mentioned in my methodology then our home appliances started working smartly with the help of our mobile phone and we can operate our home appliances very smoothly and conveniently

4.2 DISPLAY OF RESULT

Now I am going to show you RESULTS

4.2.1 Displaying the RESULT when the SWITCH IS OFF

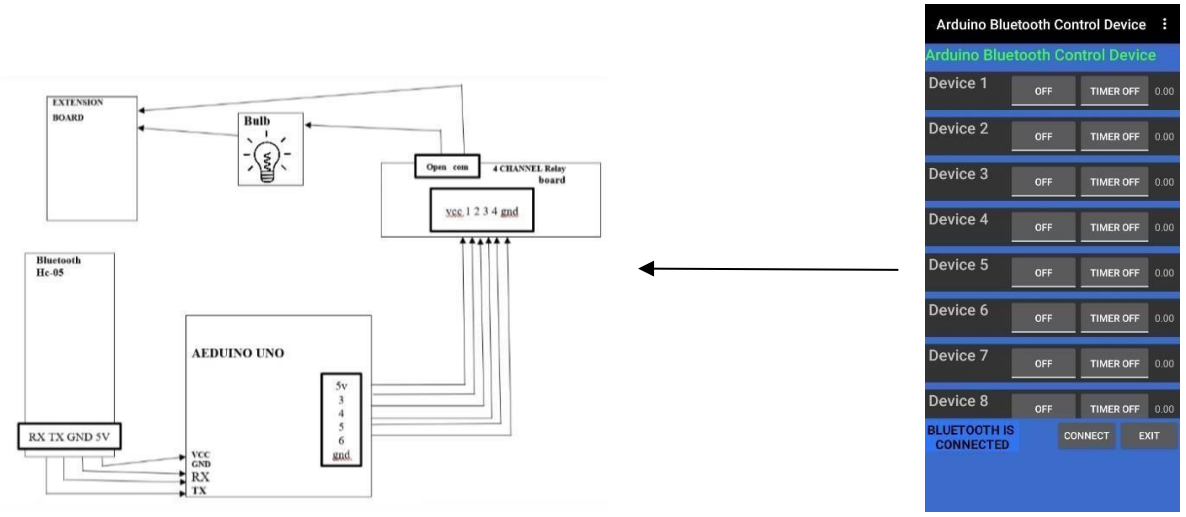


Fig 4.1 Clearly shows when the switch is OFF in the application BULB does not glow

4.2.2 Displaying the RESULT when the SWITCH IS ONN

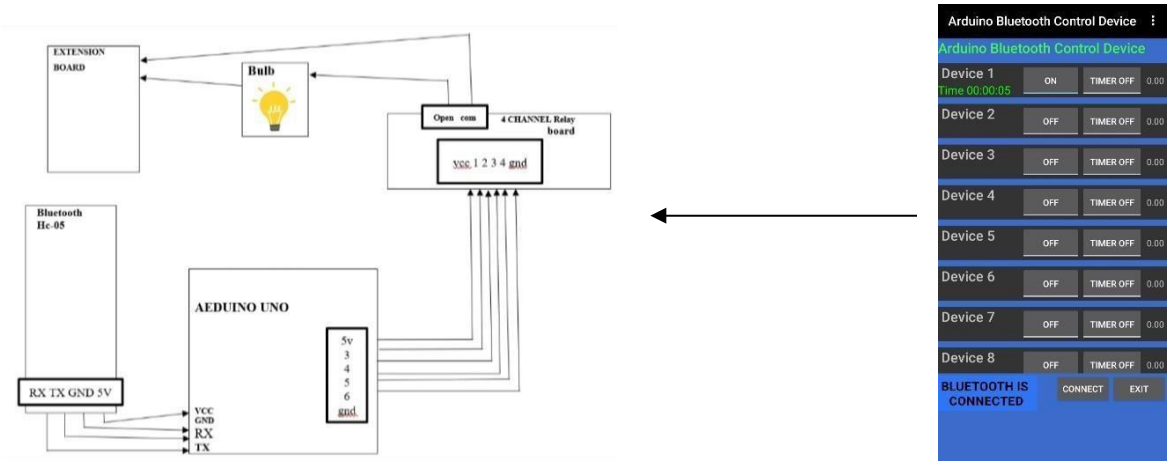


Fig 4.2 Clearly shows when the switch is ONN in the application BULB glows

Chapter 5

CONCLUSION AND FUTURE WORK

In conclusion at last I want to tell you that the SMART HOME APPLICATIONS are the future of upcoming generation . Wireless control is the most significant basic needs for all the people. Our Home automation will be helpful for disabled and Elderly people to perform ON and OFF operation automatically with the help of the mobile phones. The people will be able to interact with the system. It also is an important aspect in the present world where people are so busy, this would help them in easing the basic functionality of their life. IoT technology has great impact in everyone's everyday life. This survey describes various methodologies used in home automation system to control and access the home appliances remotely through Internet services anywhere anytime . This ARTIFICIAL INTELLIGENCE is becoming future. Main purpose of home automation system is to provide ease to people to control different home appliances with the help of the android application present in their mobile phones and to save electricity, time and money.

At last of my topic I want to tell you that SMART HOME APPLICATIONS is to going to become our future and most important thing in our daily life .

REFERENCES

[1] - Mr. T. M.Senthil Ganesan 1 , M. Rama Jothi 2, R. S. Sangavi 3 , L. Umayal 4 Departmentof Computer Science and Engineering Velammal College of Engineering and Technology, Madurai.

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