

Smart Home

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ABSTRACT

A contemporary way to operate any home appliance is to physically turn the switch on/ off. Thanks to the advancements in the field of IoT and mobile technology we can turn our home in a smart home. Humans take great pride in being the only intelligent species on the planet earth. With that being said, we like to have control over all the aspects of our life. The human race has come so far, from simply eating bananas to actually walking on the moon and everything in between. We can even control, although clumsy but highly efficient, rovers on the bumpy terrains of Mars right at the comfort of our office i.e. the ground control. And yet we cannot seem to take a complete control over our home appliances. All we wish is that our home gets a little smarter only to make our lives easier and lazier than ever before besides looking cool.

CCS CONCEPTS

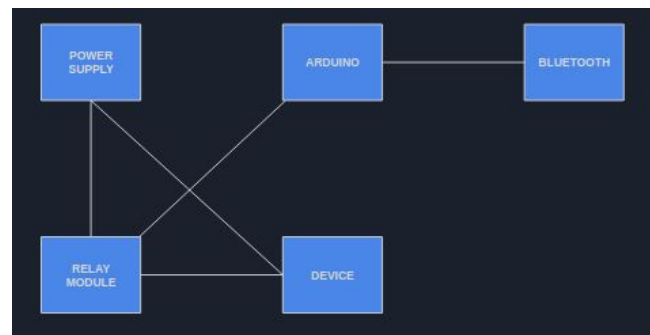
• Hardware → Electronic design automation

KEYWORDS

Arduino, Bluetooth, Smart Home, Mobile

INTRODUCTION

It's a home automation system also called as smart home. A device to smartly manage and control your everyday electrical appliances and bring them to life. It consists of a central hub (Arduino) and a user interface (Mobile App) to control the devices over bluetooth signal. It



enables to use handheld smart devices to control our everyday appliances.

SYSTEM DESIGN

Figure 1: System Design

The arduino is powered by an external power course (a portable charger in our case). The bluetooth and relay module is connected to the arduino. The appliances are connected to the arduino on pins 4,6 and 8. The light is connected on pin 4, fan on 6 and smart plug on 8.

The relay module controls the current flowing to the appliances. One end of the wire is connected to the appliances and other to the mains. The relay module is connected in the middle that controls the current. The signals received by the arduino are passed to the arduino as signals that switches the appliance ON or OFF.

HARDWARE

1. Arduino Uno



The Arduino Uno is the backbone of our smart home system. It is the central hub for controlling the devices over the mobile app using connected via bluetooth to the smartphone.

2. Relay Module



The relay module is the switch that controls the devices and turns them on/ off with help of Arduino.

3. Bluetooth Module



This tiny device is responsible to wirelessly control the devices over bluetooth by communicating with the Arduino using the smartphone.

SOFTWARE

Arduino IDE

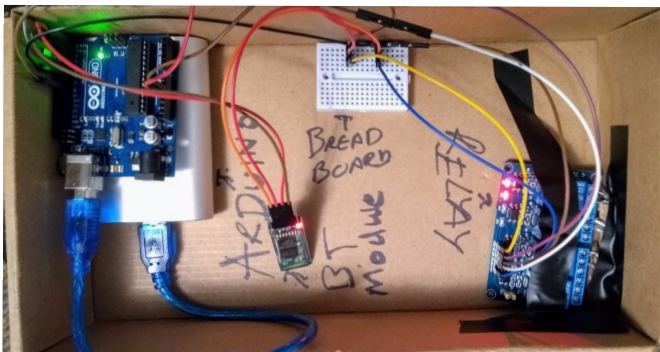
1. We have programmed the Arduino Uno using the proprietary Arduino IDE 1.8.8. The Arduino code uses flags to simply control the devices connected to the Arduino board.



2. Android App

For developing the mobile application for android we used the block programming approach using the MIT App Inventor 2 which is an open-source web application for developing android applications.

WORKING



The working of our project is fairly simple but just have to be careful as we are dealing with 220v AC current. In this, all other modules like the relay and bluetooth are connected to the arduino. The signals that are received from the application are given to the relay module and accordingly the appliances work (either ON or OFF). The appliances are connected to the arduino on pins 4, 6 and 8.

The appliances are connected to the relay module. one end of the connecting wire is connected to the the mains and other end is connected to the appliance. the

relay module is connected in the middle of the circuit to control the current flowing through the circuit.

To make this system work, you need to pair the smart phone with the system. This is done using the bluetooth module. Once paired, open the application and select the connected bluetooth device from the application. After successful connection, the app is ready to use. There are buttons provided that controls each appliance. Using those buttons the appliances can be controlled as long as the mobile phone is in the bluetooth range.

CONCLUSION

In this project we successfully made a prototype to control the home appliances wirelessly using smartphones. For achieving such a goal involved delving into the concepts of IoT and home automation demanding a fair knowledge of programming with a basic understanding of hardware modules.

The future work focuses more towards a more robust yet wireless approach involving controlling the devices using wifi with an extended range and improved overall accuracy.

REFERENCES

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- [2] <https://www.arduino.cc/en/Main/Software>