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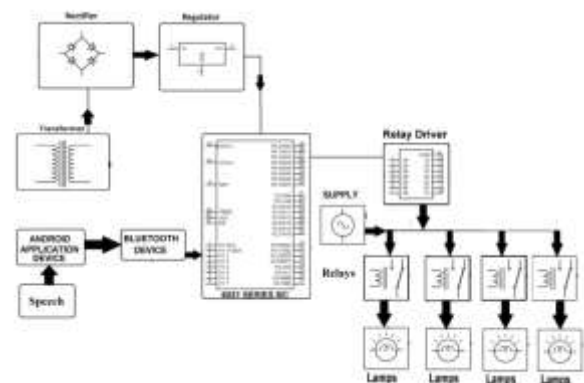
Abstract: - A fully autonomous home is going to be the future. Everyone want that the complete control such as switching on/off the lights, fans, televisions and other appliances through one device. This paper presents a novel solution that makes this future a bit nearer. Voice controlled automation, as well as a universal remote control application on an Android platform, has been presented. In this paper, the voice input has been captured by the android and will be sent to the Arduino Uno. Bluetooth module in Arduino Uno received the signal and processed the input signal to control the light and fan. The proposed system intended to control electrical appliances with relatively user-friendly interface and ease of installation.

I. INTRODUCTION

As the technology is advancing the automation in various fields can easily be seen. Day by day the effort for doing the daily routine work is decreasing, and it's necessary for the busy schedules the people are having as well as for the cost effectiveness. For example washing machines, autonomous vacuum cleaner, dishwashers, etc. have reduced the manual efforts, and it's quite affordable. Similarly, for the physically handicapped or elder persons the mobility is quite a difficult task and they always need some assistance for doing various tasks. Even when someone returns home tired, they feel quite difficult to do the simple activities like approaching the switch board for switching various appliances, closing curtains or windows, opening the doors, etc. In this paper, we are going to resolve such problems. By introducing VC HUB system that can provide switching control of various household appliances as well as some other tasks that constitute the home automation system.

VC HUB provides its residents the comfort, convenience and ease of operation of all devices at all times, irrespective of where the resident actually is within the house. With the help of VC HUB we can automate electrical appliances such as fan, light, air-conditioners, heaters, air-coolers, microwave etc and electronic gadgets such as television, audio systems etc all these appliances and gadgets can be controlled remotely, over a secure channel using Bluetooth through software application. Application of voice to control home appliances can be seen as new paradigm in the VC HUB as shown in Fig. 1

In this paper, voice recognition and touch screen button are successfully developed for home appliances using android via smart phone. Four home appliances that have been chosen for this project are fan, light, air-conditioner and heater. Inside this system the users can control the fan and switch off/on the light and other devices from the smart phone. The Bluetooth wireless environment have been used in this VC HUB system. Bluetooth module in the smart phone transmits the commands from android to the Arduino Uno. In Arduino Uno the Bluetooth module received the signal and then processed the input signal. Arduino is easy to used, open source and the software development is free. Furthermore, to develop the application of android we used Basics of Android software. This software used Java language and easy to program. We used smart phone which act as remote control to control the home appliances . We have successfully developed a voice control home appliances system which can make our life easier.



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II. SYSTEM OVERVIEW

The block diagram of voice control home appliances is illustrated in Fig. 1. Android application act as interface between smart phone and Bluetooth. Users give the input via the smart phone by using touch voice command.

The android application and Arduino Bluetooth controller are the main applications for implementing the system. The relays, rectifiers and regulators are being used for various control purposes Fig 1 gives the overview of the system architecture.

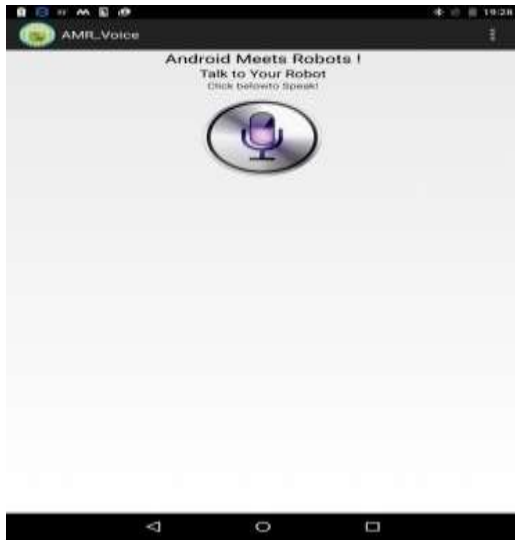


Figure 2 Android application

Here first we need to connect to hardware part with the help of Bluetooth. Figure 2 is a android application for home automation by commands. Android application:- This is a voice controlled application. As shown in the figure on tapping on the microphone (mic) icon, the voice commands is sent for controlling various appliances. First step is to tap the mic icon and say something. The speech commands get converted to text. The converted text is sent over the Bluetooth of the Android mobile to the serial buffer of Arduino via Bluetooth module. From the serial buffer data retrieved for the voice commands. By using Arduino Uno programmer the data strings are compared with lookup table and generated an actuation signal for the relays to control various appliances.

III. APPLIANCES AND APPLICATIONS IMPLEMENTED

This section discusses the various appliances where the testing of the system designed is implemented to make a complete automation system. In this work four appliances are tested using the touch and voice control.

SL.NO	Voice Command	Action Performed
1	Light on	Turns on the light
2	Light off	Turns off the light
3	Fan on	Turns on the fan
4	Fan off	Turns off the fan
5	AC on	Turns on the AC
6	AC off	Turns off the AC
7	Heater on	Turns on the heater
8	Heater off	Turns off the heater
9	All loads on	Turns on all the loads
10	All loads off	Turns off all the loads

IV. WORKING

For using the voice commands the following steps are as follows:-

Step1:- Open the android application and click on connect as shown in figure 3 to connect the application to the Bluetooth module.

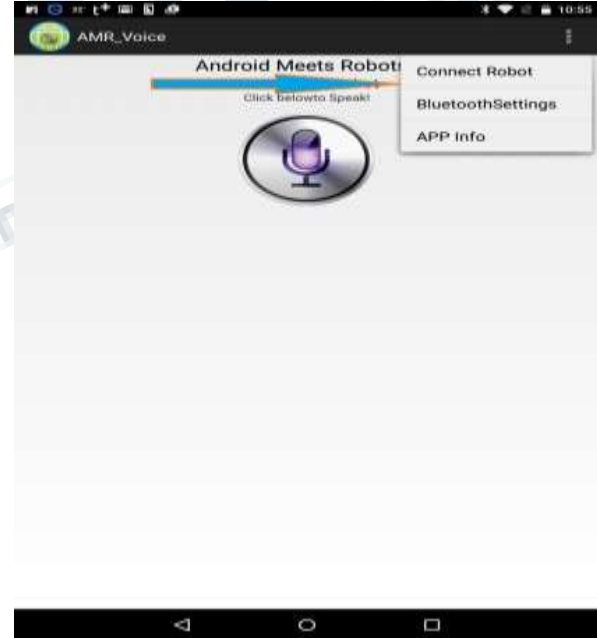


Figure 3 Option to connect to Bluetooth

Step2:- Once the module is connected tap on the mic icon of the app as shown in Figure 4 and say the command.

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Figure 4 Touch the mic icon to speak

Step3:-Once we speak the app converts the voice to text using Google voice services that go over the phone Bluetooth to the Bluetooth module.



Figure 5 Connection diagram

Step 4:- : From the serial buffer we get the stored text, and we use it as the control commands for various purposes. The code snippet for the purpose is as shown in below.

```

While ( Serial.available () ) {
delay (10);
Char c = Serial.read ();
if ( c=='#') { break; }
voice += c;
}
if ( voice.length() > 0) {
Serial.println(voice);
if(voice == "light on") { digitalWrite(led1,High); }
else if(voice == "light off") { digitalWrite(led1,low); }
else if(voice == "fan on") { digitalWrite(led2,High); }
else if(voice == "fan off") { digitalWrite(led2,low); }
}

```

As shown above in the snippet we can see that at first the serial buffer is checked for the availability of the voice commands. Suppose if the voice command is "light on", it sends a digital high signal to "led 1". It is the pin to which the relay is connected and on getting high it actuates to turn on the light. Similar is for the touch control that gets actuated on getting the character "A" and the light is switched on. Similarly, the other appliances are operated for different commands as shown in Table. Now, for the application of fan, AC, and heater the commands are similar.

V CONCLUSION

In conclusion, generally speech or voice recognition interface can be implemented in many applications. Home automation based on voice recognition has been built and successfully developed in this project. The voice recognition system in this project are transmit the signal from the smart phone to the home appliances via Bluetooth. This system was targeted for elderly and disabled people.

VI IMPLEMENTATION

Here we thought to implement it for television. Using voice commands can change the channels using the channel frequency or bandwidth.

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