

Voice Controlled Home Automation

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Abstract- Voice controlled home automation is used in controlling the electrical load with voice. The input signals provided here are the Bluetooth signals which are actually signals from android device received by Bluetooth device[6]. The system works by interfacing a Arduino-Uno set-up with the relays connected to the electrical devices which are controlled according to the commands received from the android based phone. The AMR voice app is the suitable interface to fulfill the task. Nowadays this system is needed by the handicapped and paralyzed people most because for them, in order to walk and switch ON and OFF the devices is next to impossible. Since voice commands are given so this problem is solved. Apart from helping the handicapped population, it has a number of applications in households and industries as well. This paper covers the methodology, results and uses of Voice controlled home automation

Keywords- Home Automation, Arduino-Uno, Bluetooth

I. INTRODUCTION

With the advancement in technology everybody is dreaming of a fully automated house. Voice controlled home automation is one of the trending topics from the very beginning of 21st century, many work has been done in this field. The main reason behind this interest in home automation is it reduces human effort and all the errors that may occur due to human ignorance. With the revolution in the technology the need to automate has made its scale up. Home Automation via Voice provides a platform to its user to access any electrical load like bulbs, lights, fans by their voice^[5].

It is a beneficial for a large amount of people including those who are physically challenged or are very old. Home automation is basically a microcontroller based application which can be integrated with a large number of other modules like relay, Bluetooth, WiFi or ZigBee providing a way to user to control devices through voice. The technology is having a very vast scope in future as it can not only be used for controlling home devices^[6] but it can also be used in hospitals, in schools for projectors, wheelchairs and cars. Modules like analog relay will enable the users not only to ON and OFF the loads but also to control the intensity.

II. DESIGNING

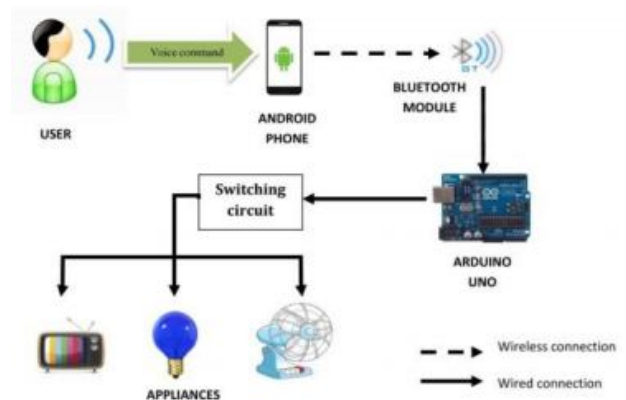


Fig1 Circuit Design

The main objective of this paper is to provide an idea of such environment in which a user is able to control devices like bulbs, lights, fans by voice. The key components used are:

- Arduino UNO
- HC – 05 Bluetooth Module
- AMR Voice app
- Two channel Relay

2.1 Arduino UNO.

Arduino-UNO uses ATmega328P IC and is an open-source platform which is used in electronics. Programming in Arduino is done by using very user friendly programming languages such as embedded C language which provides predefined commands to carry out certain applications, and the compilation and testing of the code is done in an Arduino Software (IDE) such as Arduino-UNO IDE^[4].

Due to its ease of access and interaction with the user it is popularly known as the brain of many applications. Since it helps in performing tasks which may be complex or easy, it is used by so many students and in researches. The open space nature of this device provides a base to perform the real time needs which can be a live project operated by phone or voice or even gesture. Applications using Arduino can be implemented with accuracy and compatibility.



Fig 2 ARDUINO UNO Board^[4]

2.2 Bluetooth HC – 05.

Bluetooth module is used for wireless networks and wireless communications. Here HC-05 Bluetooth module is used. It has pins: TX for transmission, RX for reception, VCC and GND^[4].

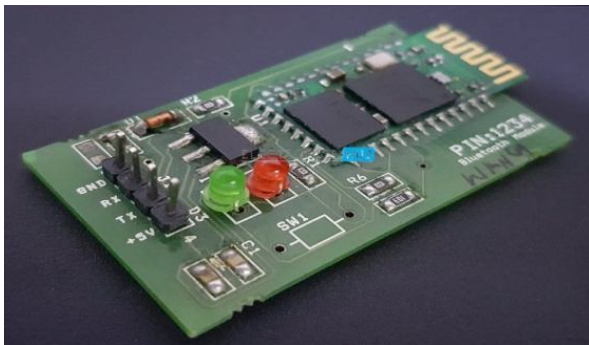


Fig 3 Bluetooth Module

2.3 AMR Voice app.

It is an Android app which is designed by Simple labs IN, in order to work on the applications operating over voice commands. In order to recognize voice it converts the voice commands to characters or strings with the help of Bluetooth^[6].

2.4 Relay Board.

A relay is a device which connects any low current transistor device to a high current device. It is mostly considered as switch.



Fig 4 Two-channel Relay

Relays are used where a user needs to control many circuits with one device. Relays used to control motor which is a high power device is known as contractor. Most of the relays are used to protect the circuit from overloading and are known as protective relays^[4].

III. IMPLEMENTATION

The whole concept can be easily implemented on a breadboard. The Bluetooth module, relay are connected to Arduino-UNO. Then by using the Android app a user can easily instruct the UNO board to turn ON an OFF the loads. The signal first go to Arduino through Bluetooth followed to relay. The working follows the following steps:

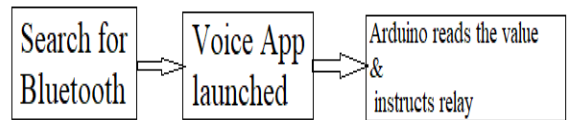


Fig. 2.4 Design Flowchart

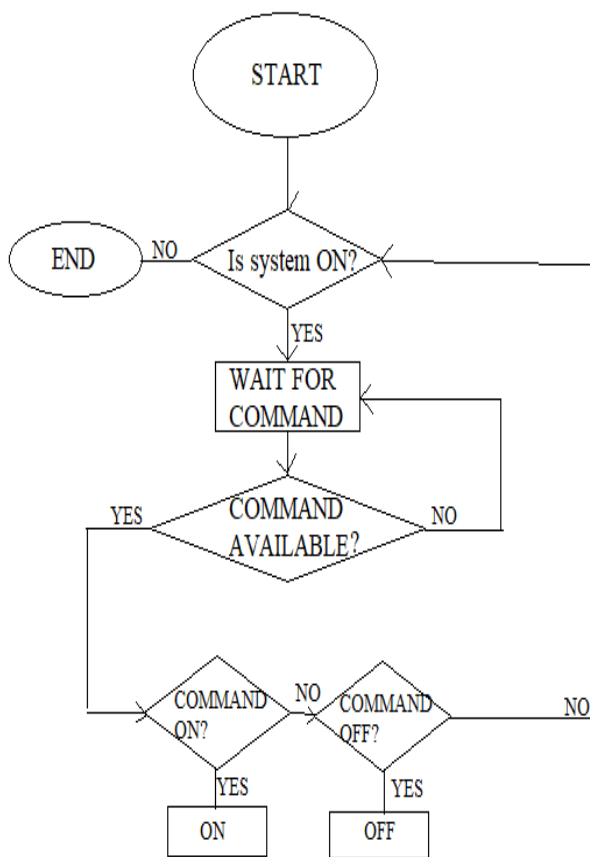


Fig. 2.5 Program Algorithm^[2]

IV. CONCLUSION

After the study, it can be concluded that a any household device can be easily controlled from any corner of the house through voice. Since it is having voice as an interfacing medium it becomes very flexible and simple to use. It is not necessary that a user should be a fluent English user, if the basic on and off words are known to the user then the commands can be easily given and the device can be controlled effectively. It can be used not only at homes but in other places like offices, hospitals and is beneficial for handicapped and paralyzed people. Its ease and scalability make its affordable to a large number of users Its main advantage is to reduce the manual errors and efforts to switch on and off the lights, fans etc. Since the system is very economic, so if taken to the market then it will be a great source of profit having the results which are of great accuracy. It is not only useful at present but it has wide future scope as it supports the idea of a fully automatic environment by enabling a user to operate the appliances from anywhere. Also the system can be used over multiple network together if a WiFi module or ZigBee is used but they are much suitable for point to point instructing^[7]. Apart from it if analog relays are used

then the use can be expanded to continuous increase and decrease of values rather than just ON and OFF a device. It will enable us with the idea of operating even vehicles and other motor operated appliances but then the cost of the system will be increased.

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