

# IVRS Based Home Automation using Voice Feedback

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## Abstract

This project titled “IVRS BASED HOME AUTOMATION USING VOICE FEEDBACK” to regulate an appliances with our voice through an Android application. An Arduino Mega board is used for controlling the relay by which an appliance is going to switch on or off. You can modify or alter the Android app to add more features to control accurately. Automation is one of the most important one in the upcoming decades. The Bluetooth module plays a vital role in home automation using voice recognition through the Bluetooth module. The attraction in an automatic system is mainly used for minimizing the number of human workers, efforts, working time, cost that is paid to the workers and the errors can be reduced that is being caused by the workers. In modern science and technology development, smart phones are one of the most necessary things for every individual in this world. By collaborating all ideas, we are going to do a project named IVRS based home automation using voice feedback with the help of an Arduino board that is connected to the Bluetooth Module HC-06. This system will definitely help the humans who are using this system in their place to control/regulate over the devices connected to this system.

In modern world, everything is based on the android application. We can control the devices using mobiles through the hardware and the software that is connected to the automation system to regulate/control the appliances.

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## I. INTRODUCTION

From the past decades, for every appliances there is a control especially for TV and alternative electronic devices, that have changed our life very simple and easy. Do you puzzled concerning about the home automation might provide an ability for dominant fluorescent lamps, fans either ceiling fan or table fan and alternative electronic appliances reception employing a remote or control? The answer will be definitely Yes!, But the area unit out there choices price – effective? If the solution is not any, we’ve got found an answer to that. We’ve got come back up with a replacement system referred to as Arduino required system mostly home automation system mistreatment by Bluetooth. This system is amazing – price effective for creating the system and might provide the customer, is mainly the flexibility management to regulate any/specific device .

In order to avoid wasting their time all should have a tendency to area unit introducing an Automation system for home by making the connection with the Arduino board to the Bluetooth module along with the relay. With the help of this assistance, the method of this system will be able to manage your home appliances from your transportable using the vary of Bluetooth.

### 1.1 Importance Of Interactive Voice Recognition System

The objectives of interactive voice recognition systems using voice feedback are twofold:

1. Implementing a cost low, flexible to the humans, reliable for understanding and scalable that is mainly using in the automation systems in home, offices, etc.

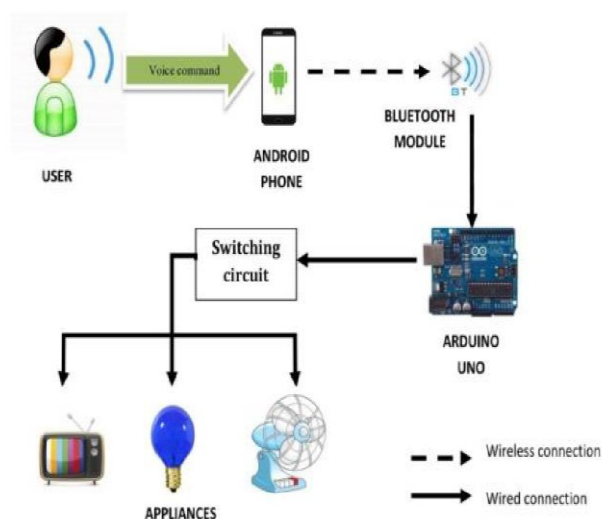
## 2. Low cost short messaging service,

**Low Cost** The cost for the system is very low. It is applicable for poor people also. This system can be done anywhere in any industries. Now-a-days, home automation has become one of the most important things with low cost, reliable and scalable.

**Short Messaging Service** Normally, in home automation the minor devices i.e., small devices will be connected to the major devices like Arduino, Bluetooth module, etc. The messaging services cannot be activated automatically.

## II. DESIGN

### 2.1 System Design



**Figure 2.1 System Design**

The Voice-operated humanoid is associated with an Arduino board for automating the home appliances which uses a humanoid primarily regarding Bluetooth associated phone for its specific application and therefore an Arduino UNO board because it is a microcontroller. The main elements for this kind of method are:

1. Humanoid primarily associated phone
2. The Bluetooth HC-06 module
3. Arduino UNO

### 2.2 System Description

This particular system has two most important sections: one is hardware and the second most things are the software. Mainly the hardware part includes three main elements: 1. Android software containing mobile, 2. An Arduino UNO or Mega board and 3. The Bluetooth HC-06 or HC-05 module. Here, likewise the hardware, the software also consists of an Arduino integrated development environment (IDE) software to run and execute the program if the system contains the programming section and the module is connected to an android application between the application and the module.

### 2.3 Hardware Architecture

This projected automation system in home consists of 3 hardware equipments: 1. Android mobile, 2. an Arduino UNO or Mega board and the Bluetooth module. Smart phones are wont to connect with the Arduino boards employing an application and the technology used in the Bluetooth. During the analysis, the Bluetooth HC-06 module and an Arduino UNO are mainly used for the hardware implementation in this system.

## III. COMPONENTS DESCRIPTION

### 3.1 An Arduino Microcontroller

An Arduino Mega may be a microcontroller that supports ATmega1280 data sheet. It contains 54 input/output pins of digital, 16 inputs as analog inputs, 4 UART s (hardware ports as serial), a 16MHz crystal oscillator, an influence power jack, an ICSP header, and also a push button. It has everything that is required for supporting the controller; therefore it will merely connect to a personal computer with a cable or providing the power to it through a ADC adapter or through the battery that includes to get started.



**Figure 3.1 Arduino Mega Microcontroller**

An Arduino Mega board will be a battery-powered board through the cable association or through an external power supply that'll provide.

An External power will also keep company with either an ADC adapter or with the battery. The adapter will always be connected by plugging into a 2.1 mm plug in the board's jack. Lead from an electric/electronic battery will be inserted onto the GND and VIN pin headers have the ability for the connection. This board will always care for an external provider for half dozen to 20V. If it is provided with 7V, the 5V pin may provide a 5V and also this board is not stable. If this mistreatment is quite 12V, then the transformer might be overheated and it will cause injury the board. The recommended suggestion varying from 7V to 12V.

An Atmega280 had 128KB of non-volatile memory for storing the code (in that 4KB is employed for a boot loader), 8KB for SRAM and 4KB for a EEPROM (that will browse and will written within the EEPROM library). Every 54 digital pins in the Mega board will be used for input and output, using the commands like `pinMode ()`, `digitalWrite ()` and `digitalRead ()` functions. They will operate only at 5V. Every pins will give or accept most of the 40mA and it also has an indoor pull up resistance (Default it will get disconnected) 20-50kOhms. An Arduino Mega board has a range of facilities for human activities by a personal computer, an Arduino board, or by alternative microcontrollers.

An ATmega1280 consists of 4 hardware for TTL (5V) serial communication. A FTDI232RL in the

board channels combined altogether for USB and also a FTDI driver gives a virtual communication port for connecting the software in the personal computer. An Arduino software system that also includes the serial monitor that'll permit the straight forward information that has to be sent to the board and receives the matter from an Arduino board. The receiver and Texas LED's in the board will be flashed, when the information is being once transmitted via the chip and an USB association to personal computer (not for the serial communication between the pins 0 and 1).

An ATmega1280 is giving the additional support to I<sup>2</sup>C and the SPI for communication in an Arduino board. To give the details of SPI for communication, we have to see an ATmega1280 data sheet for an Arduino and the Bluetooth association.

## 3.2 Arduino Software

### 3.2.1 Integrated Development Environment (IDE)

An integrated development environment (IDE) may be cross-platform app (Windows, mac OS and Linux) had wrote within the coding language Java for easy understanding. It has been originated from IDE for language Processing and also for the Wiring. This includes a workspace with the specifications for cutting the message and pasting it where ever it needed, searching for text and replacing the same text, an automatic indenting, checking the brace matching, and highlighting the syntax that's important, and providing a simple one-click process for compiling and uploading programs in an Arduino. It consists of a messaging area, an editor or a space, a tool with a related buttons for most used functions and mainly for hierarchy of operation menu. The ASCII text file for an IDE has been released that is coming under the General Public License.

An Arduino IDE software library used the program for converting an executable program to a document

in hexadecimal being loaded to an Arduino board by a loader in the firmware. A user program with Arduino software is called the sketch. The Sketches will always get stored in the development part of the computer as a text files using the file extension .ino. An Arduino Software (IDE) pre-1.0 is saved using the file extension of .pde. It has 2 main functions. They are:

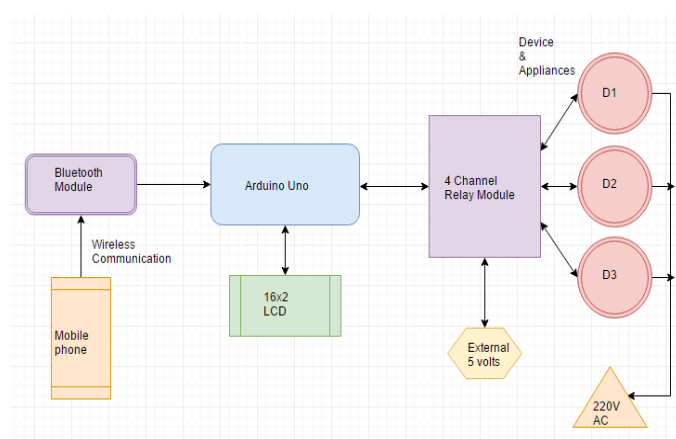
- 1.setup()
- 2.loop()



**Figure 3.2.1.1 Arduino IDE Software**

It will accustom for writing and uploading the programs to an Arduino board. The program of this system will be done by providing Arduino IDE software using a programming language C.

### 3.2.2 Block Diagram Of An Interactive Voice Recognition System Using Voice Feedback



**Figure 3.2.2 Block diagram of Interactive Voice Recognition System**

## IV. APPLICATIONS AND ADVANTAGES

There are many real time Applications for Controlling the Electronic and Electric devices through manual Voice, the very few of the applications are:

1. By using this system, we can reduce the man power issues in the industry.
2. By making the system automatic, the robots are this system will handle all the issues in the industry.
3. This automatic system will definitely help the paralysed people and also the elder/older people who can't even stand.
4. This system is mostly used by the employees who didn't even have a time to do their daily routines.

## V. RESULTS

Controlling or regulating the devices of household appliances is successfully achieved. The household appliances like a ceiling fan, either a fluorescent lamp or the LED lamps. Here the fan will be regulated upon three levels in speed i.e., full speed, medium and a power off state. This bulb may voice operated upon two levels i.e., switching ON and switching OFF and this system will be used for operating the loads with high weights in house. For example, an air conditioner.

## VI. CONCLUSION

In our project, we did automation for regulating or controlling the home appliances for avoiding the wastage of time. It will be merely helpful for an older people. Especially for the software engineers in this modern world.

## VII. FUTURE SCOPE

This project is completely for controlling and automating for switching on and off an electronic devices not only the appliances that are in the home but also this can be used in offices and gives us a message to state the devices to on and off.



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