

# **Controlling Home Appliances Remotely through Voice Command using Android Mobile**

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## **ABSTRACT**

The development in home automation is moving forward towards the future in creating the ideal smart homes environment. Optionally, home automation system design also been develop for certain situation which for those who need a special attention such as old age person, sick patients, and handicapped person.

The main objective of this project is to develop a home automation system with VOICE COMMAND Android application controlled remote using GSM TECHNIQUE. As technology is advancing so houses are also getting smarter. Modern houses are gradually shifting from conventional switches to centralized control system, involving wireless controlled switches. Presently, conventional wall switches located in different parts of the house makes it difficult for the user to go near them to operate. Even more it becomes more difficult for the elderly or physically handicapped people to do so. Remote controlled home automation system provides a simpler solution with Android application technology.

## **INTRODUCTION**

The past decade has seen significant advancement in the field of consumer electronics. Various “intelligent” appliances such as cellular phone, air conditioners, home security devices, home theatres, etc., are set to realize the concept of a smart home. They have given rise to a Personal Area Network in home environment, where all these appliances can be interconnected and monitored using a single controller.

Home automation involves introducing a degree of computerized or automatic control to certain electrical and electronic systems in a building. These include lighting, temperature control, etc.

This project demonstrates a simple home automation system which contains a remote mobile host controller and several client modules (home appliances). The client modules communicate with the host controller through a wireless device such as a Bluetooth enabled mobile phone, in this case, an android based Smart phone.

Proposed method reduces the wiring and complexity of the system. It has no geographical limitation and can be used on any GSM network; it provides portability to the system. It is mainly focused on the elderly people, disables and for the people who are unable to type text or face difficulties in typing. For the disable people, it is quite difficult to operate the HOME appliances physically or they are unable or feel uncomfortable to type a text so as to switch on/off the relative device. So a system has been developed to monitor the Appliances remotely by simply running the mobile application and giving voice command. The mobile application efficiently converts the voice command to text and transfers it to the GSM network. It is affordable to everyone, cheap and easy to install.

As there is no wired communication between the remote user and appliances control module and the electronic devices used to control are easily available making it a cost effective solution. The technology used to develop the system is Java for mobile and MPLAB for microchip family of controller, and Bluetooth interface for wireless communication between home mobile and hardware control module.

## **LITERATURE REVIEW**

### **1. Advance Home Automation Using FPGA Controller:**

In this paper, author introduced a new technology with Field Programmable Gate Array (FPGA) controller, Bluetooth and Android phones. It is wireless technology. VHDL language is used for a Xilinx Spartan-3E. V means VHSIC (Very High Speed Integrated Circuit). FPGA Controller is based on Basys2 development board. FPGA has a many input and output pins so it can connect number of home equipment's. FPGA is used for controlling home equipment's. Bluetooth is used for monitoring equipment by wireless technique. Android phone is used for speech recognition. DC motor, stepper motor, a LED is connected to FPGA. A microcontroller has less number of input and output pins than FPGA Controller. Main aim of this paper is to increases the speed using parallel communication.

### **2. GSM Based Home Automation System Using App-Inventor for Android Mobile Phone:**

In this paper, author introduced Home automation based on GSM system using App-inventor for Android mobile. In App inventor, programmer has to design different blocks than design the source code like in LabVIEW software. Programming is not essential. The main aim of this paper is to have ease in programming using App inventor and security using GSM. App inventor is a platform to design a new smart phone apps using android. User has to login first online then start to design both part the screen objects (Designer) and the programming logics (blocks). User can control home equipment using GSM by each corner of world. In hardware, ULN2803 octal peripheral driver array, ATMEGA328 Arduino board with microcontroller, GSM Modem, Relay and some other small components are used. Arduino board worked as a transceiver. It has 23 I/O lines. In this paper hardware and software part is done individually.

### **2. Android Based Appliances Control System:**

In this paper, controlling fan speed and light intensity is specialty of the project. This paper hold two parts, hardware part called process unit and software part called monitoring unit. Process unit contain Bluetooth module LM400, LCD, dimmer circuit, and microcontroller PIC16F877 (40 pin IC). Monitoring unit contain only smartphone. For better efficiency dimmer circuit is designed using SCR. Home appliances can control using android phone which has Bluetooth application. Bluetooth module is used for communication. It is wireless technology. Dimmer circuit is used for controlling the fan speed and intensity of light.

### **3. Bluetooth Based Home Automation and Security System Using ARM9:**

In this paper, the two microcontroller development boards viz ARM 7 and ARM 9 were used. ARM 9 (S3C2440A) is in transmitter side and ARM 7 (LPC2148) is in receiver side. Operating system Wince6.0 is used for designing the application on ARM9. In hardware parts ARM7, ARM 9, ULN2003, Relays, Bluetooth module are used. VB.NET is used for designing apps. Graphical User Interface module and Serial Port Profile modules are used in software part. Bulb, fan is controlled using Bluetooth, ARM – MDK kits acts as a processor. It is cost effective project.

## METHODOLOGY USED

The aim of this research is to propose a model for home appliances control, an android OS based Mobile giving voice command, the mobile application convert the voice into text using android intent

API 2.01. Conversion of voice into text SMS step undergoes many other steps such as;

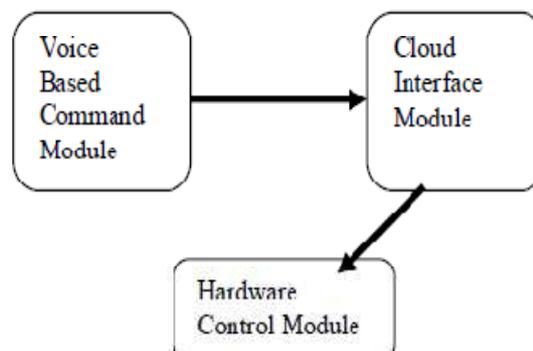
- After taking voice command, convert it into Byte Output Stream.
- Than convert Byte Output Stream into unsigned integer array. And add 255 into all those values which lie between 0-31 ranges.

The commands generated are appended in SMS payload which is sent through GSM network.

## WORKING

### SPEECH RECOGNITION MODULE:

With the daily updated technology, there will be a growing need for more convenient and natural way in information exchange between human and machine. Speech is the most natural, effective and convenient communication method in information exchange. Traditional interface which is composed of keyboard and button cannot satisfy the need of human in service robots intelligent space at present. Now as the development of speech technology, it is necessary to develop an interaction system, which can use natural language communication.



**STEPS:**

Step 1: Android based application on phone which uses voice input for control of appliances.

Step 2: Voice commands parsed from speech grammar helps in mapping from NLP to text commands.

Step 3: The text is retrieved from grammar format which must be known to user in prior context.

Step 4: Text is converted to commands to be processed efficiently and reliably to perform action.

Step 5: The command is sent to cloud module which uses Google cloud messaging service to downstream and upstream light information.

Step 6: Hardware module has the functionality to accept messaging and act accordingly to the appliance mentioned with respect to command.

**FUTURE WORK:**

Efficient algorithm design for speech based system is a great topic of research for development of such systems.

Application on mobile system should be able to utilize voice based interface for user. Processing of commands can be done on cloud platform to increase the speed of mapping accuracy. Networked appliances should be preconfigured and in build for support of mobile based controlling applications.

**CONCLUSION:**

The communication link between the appliances and remote user plays an impotent roll in automation. In this study we proposed a system that control electric appliance via voice when the user is in remote area, and also it controls the appliances through home mobile.

The home automation system has been experimentally proven to work satisfactorily by connecting sample appliances to it and the appliances were successfully controlled from a wireless mobile device.

The Bluetooth client was successfully tested on a multitude of different mobile phones from different manufacturers, thus proving its portability and wide compatibility. This project will not only provide convenience to the common man but will be a boon for the elderly and disabled.

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