# Home Appliances Control Using Speech

**Sabale S. A[1] Waikar S. A[2] Kinikar P.I[3]**
[1,2,3]Department of Electronics & Telecommunication
[1,2,3]Dr. Daulatrao Aher College of Engineering, Shivaji University Karad, Maharashtra, India

*Abstract—* This paper present the overall design of "Home Appliances Control Using Speech" with low cost.This system is designed to assist and provide support in order to fulfill the need of elderly and disabled persons. It was design to solve a appliances control problem in home, company, auditorium, halls etc. The actual process home appliances control using speech use to control all electrical and electronic appliances."Speech recognition "is technology in which human speech is recognized by machine such as computer, using speech recognition one can operate a computer.For this project, the system is called speech operated system for home appliances.It is used to read the speech of user from a microphone which is connected to the computer wired or wireless, analyze the speech characteristics and then transduced it into machine understandable format. In our project electrical and electronic appliances will automatically ON and OFF through speech and keypad. In our project we use visual basic software for speech recognition .It consist of a words 'one' or 'two', the project according to this will sense the commands and control respective appliance .Also keypad is use for as an optional. The "Home Appliances Control Using Speech" concept in the system improves the standard living at home. The system intended to control electrical appliance and devices in house with relatively low cost design, user-friendly interface and ease of installation.
*Key words:* Automatic Speech Recognition, ARM7 Controller, PC, Visual Basic

## I. INTRODUCTION

In the future, speech recognition will be the method for controlling appliances, computers and robots. In future there will be a huge demand waiting for this technology to become perfect.The construction and building of a stand alone and very less expensive speech recognition technique that may be used to control just about anything such as electrical appliances, robots, test instruments, Fans, Light, TV's, etc. Speech recognition is a multileveled pattern recognition task, in which signals are examined and structured into a sequence of sub word units (e.g., phonemes), words, phrases, and sentences. At the same time speech has various type of unique characteristics which are used for speech as well as speaker recognition .To control and command an appliance by speaking to mice, will make it easier, while increasing the efficiency and effectiveness of working with that device .It is useful for physically handicap persons in their day to day activity.

Classification of Speech recognition is in two categories, speaker dependent and speaker independent. As its name suggest, a speaker dependent system is intended for use by a single speaker, but a speaker independent system is intended for use by any speaker. Speaker dependence is difficult to achieve because a system's parameters is tuned for a particular speaker and these parameters tend to be highly speaker-specific. Following figure shows automatic speech recognition system. [9][10]
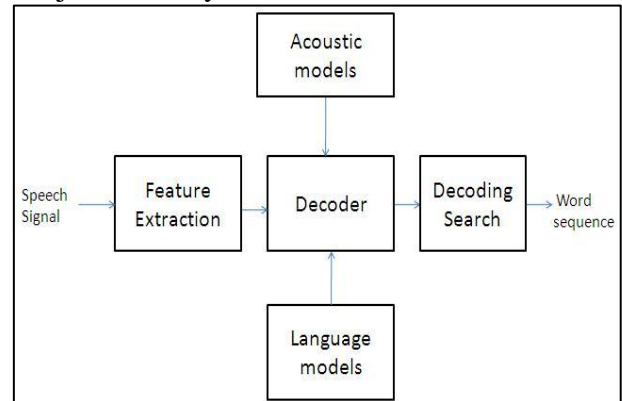


Fig. 1: Automatic Speech Recognition System

In feature extraction, speech features are extracted from recorded speech of male or female speaker. In acoustic model the temporal information of speech feature vectors plays an important role in recognition process. In order to capture the dynamic characteristics of speech within the framework of the Bayesian classifier, certain temporal restrictions should be imposed. Decoding is the process to calculate which sequence of words is most likely to match to the acoustic signal represented by the feature vectors. Language models have been proven quite beneficial for a variety of automatic speech.[17][18]

The interface is the combination of hardware and software embodies the hardware is an electronic circuit that used to trigger the appliance, and the software is the programming of the PC to manage all recognition tasks in Google. In language model speech transcription tasks to highlight the impact that one can expect from increasing both the amount of training data, and the size of the language model estimated from such data. Depending on the task, availability and amount of training data used, language model size and amount of work and care put into integrating them in the lattice rescoring step we observe reductions in word error rate .Decoding search is useful for providing output as an word sequence.[1][2]

## II. PROPOSED SYSTEM

To convert an ordinary home, all appliances must be controllable through computer. As we know PCs are provided with input/ output ports, which makes easily to interface PC with the real world applications. The interface is the combination of hardware and software embodies the hardware is an electronic circuit that used to trigger the appliance, and the input/output signals to its ports, hence, the interface hardware circuits. In this paper, for the purpose of interfacing with the real time control applications, the PC parallel port is used. Since the parallel port works well as hardware interfacing .The parallel port pins are TTL levels output. This means that they put output 0 to 0.8 dc volt logically 0, and 2.4 to 5 dc volt logically 1. According to the parallel port behaviours, there are 8 bits for data input/output, which can produce 256 different control signal statuses .Inside the program by using the command Dllcall(

) could be used to directly access all data port signals ,There are many ways could be used to control all home's appliances by sending appropriate signals to the PC's ports ,parallel or serial. Then these signals inserted to the interface hardware system that prepared, designed and matches with the output signals, then depend on the signal, the interface hardware control or manage one or more of the home appliances.
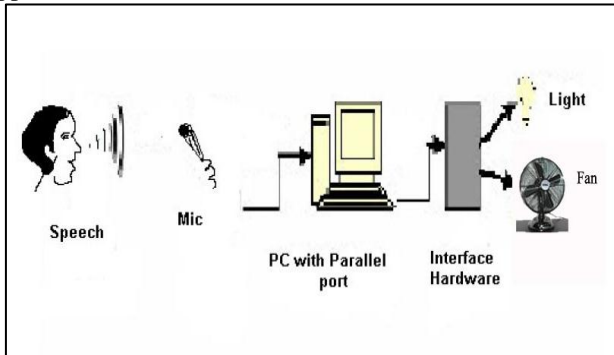
Fig. 2: "Home Appliance Control Using Speech" System
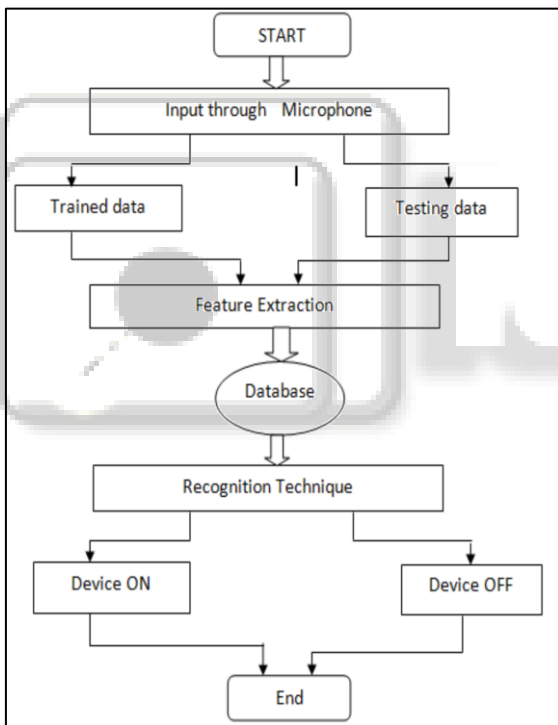
## III. PRINCIPLE OF SPEECH RECOGNITION

Fig. 3: Flowchart of "Home Appliance Control Using Speech System"

In Speech Recognition speech analysis is done after taking an input through microphone from a user. The design of the system involves processing of the input audio signal. At different levels, different operations are performed on the input signal such as feature extraction and Recognition (Matching) of the spoken word. The voice algorithms consist of two distinguished phases. The first one is training sessions, where recording of speech signal takes place associated with the application or uniqueness, while, the second one is referred to as operation session or testing phase, where particular speech commands matching with database is tested. On the basis of spoken command appliance get control.
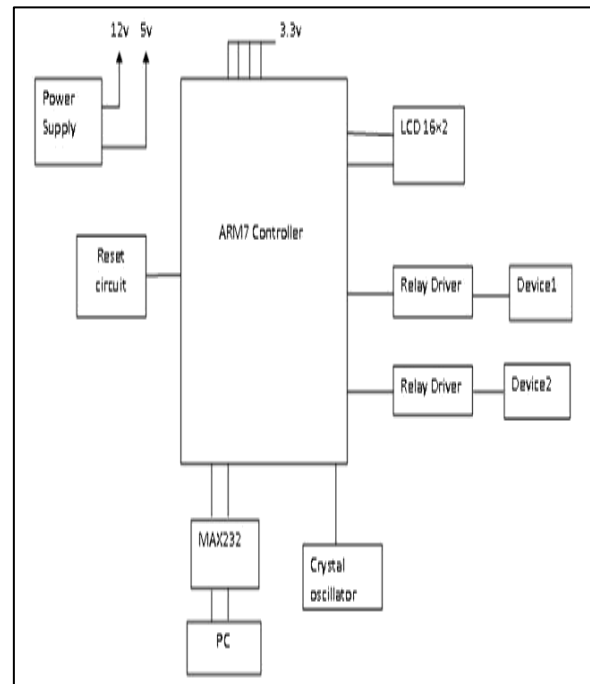
## IV. HARDWARE DESIGN

Fig. 4: Hardware design

### A. Power Supply:

By using12v step down transformer, it provide +12v to full wave bridge rectifier .Bridge rectifier give +12v pulsating dc, but some error in their output. so we use electrolytic capacitor for filteration.This pure dc given to 7805 for providing +5v .This +5v give to LM317,LM317 produce +3.3v.

### B. ARM7 Controller:

In ARM7 controller,LPC2138 has dedicated port. Two input /output port such as port0 and port1,it is 32bit. Width of p0 is 32 bit and p1 is 16 bit. Power +3.3v is given at four sides of dedicated port.10 bit ADC is used for analog voltage 3.3v.It has two serial port,32kbit RAM and 504kbit code memory. Two peripheral such as UART0 and UART1,UART0 IS used for downloading and also after downloading.

### C. MAX232:

The MAX 232 Converts from RS232 voltage levels to TTL voltage levels, and vice versa.One advantage of the MAX232 chip is that it uses a +5v power source which, is the same as the source voltage for the LCD ,Relay and MAX232.MAX232 requires four capacitors ranging from 1 to 22microfarade.

### D. PC:

By using visual basic platform matching of trained data and testing data is performed.

### E. Reset Circuit:

It is used to reset ARM7 controller and remove program interrupts.

### F. Crystal Oscillator:

It is used for providing a ARM7 controller with a clock.Clock is needed so that ARM7 controller could

execute the program or program instruction.It provides an accurate clock frequency.

*G. LCD:*

In LCD if RS=0, The instruction command code register is selected,allowing the user to send the command.If RS=1 the data register is selected,allowing the user to send data to be displayed on LCD.R/W input allows the user to write information to the LCD or read information from it.The 4bit data pins D4-D7,are used to send information to the LCD or read the contents of the LCD's internal register.

*H. Relay Drive:*

The relay takes advantage of the fact that when electricity flow through a coil it becomes an electromagnet. The electromagnetic coil attracts a steel plate, which is attached to a switch. So the switch's motion is controlled by the current flowing to the coil, or not, respectively. It can be used to electrically isolate different parts of a circuit.It will allow a low voltage circuit to switch the power in a high voltage circuit. Diode is used to restrict the flowof the charge.

## V. RESULT

The main aim of the project was to design a system in such a way that it can give maximum output with minimum complexity and this Home Appliances Control Using Speech, system delivered it. It is beneficial for handicap person and those are physically disabled.

There are some issue that arises when using this system the problem is pronunciation of the user is when doing the process. For the pronunciation matter, the system takes it at a quite high level of sensitivity. So when the user wishes to use the system, thus he/she must produced word with the correct pronunciation as in thetraining process.



Fig. 5: Hardware Of "Home Appliance Control Using Speech" System

## VI. ACKNOWLEDGMENT

## VII. FUTURE SCOPE

1) Adding confirmation commands to the voice recognition system from appliance.
2) Integrating appliance control function to improve the system versatility such as providing control commands other than ON/OFF commands such as slow down , dim etc.

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