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Analytical Survey: Speech Recognition Methods Used in Voice Recognition Techniques

A B S T R A C T

This paper mainly studies *Speech recognition methods used in voice control systems Analytical survey*, Construction of the system voice control is now urgent. Such systems can greatly facilitate user interaction with the computer system. This is especially the idea developed in the concept of Moreover, sometimes the voice Interface is a necessary component of, for example, when it comes to people with disorders of the musculoskeletal system., The work proposed describes general methods of speech recognition based on hidden Markova models (HMM), for in ability to design control system, has high efficiency through voice commands save time and effort and shorten the distance through this circuit get a security system depends on it registered only the person who by scoring and Help people with special needs to rely on themselves in some work

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Introduction

The system voice control is currently the urgent work; such systems, facilitate user interaction with the computer system. This is especially the idea developed in the concept of the so-called smart houses" voice interface is a necessary component of the task of such systems is the allocation and recognition from the flow of the signal horn (both voice and non-voice and a certain set of voice commands. The system must not respond to other areas of speech signal, including those that contain the words of predefined commands. To create such a system developer faces certain problems. First, the lack of a mathematical model of the semantics of speech signal that is reflected in the fact that in order to determine the semantics of speech signal can only be applied probability and heuristic methods. Accurate results and accuracy of which is inversely proportional to the number of semantic units, for which they are intended. Second, the individual characteristics of the Speaker: the specificity of the pronunciation, two main methods of voice control: a method of sliding window and method of models of fillers. Both methods are based on the algorithm of speech recognition using hidden Markov models (CMM) [1]. The voice tag as the divine seal created by the Almighty God to distinguish it from other humans, Each man has his imprint so that each finger in humans unique from the other imprint. has created every human footprint distinct voice in addition to the odor and eye and ear form of sound wave Show figure 1



Figure1: The form of sound wave

The human voice comes out through the vocal cords as vibrating vocal cords in the larynx due to exhaled air with the help of neighboring muscles surrounding, Nine small cartilage each of which shares with the lips, tongue and throat until tone of voice out, Tone of voice this is what distinguishes human from other humans, it is known that each of us has a different tone of voice from the other that you can distinguish between your friends and your brothers through the tones of their voices on the phone this is the imprint of their own voice [2,3].

Sound frequencies in humans:

The audio frequency range ranges in humans almost , From (300Hz -3400Hz) Acoustic speech adult male has a fundamental frequency of 85Hz to 180Hz for either an adult female, it would be from 165Hz to 255Hz so the fundamental frequency of most speech falls below the audio frequency range present for fig 2.

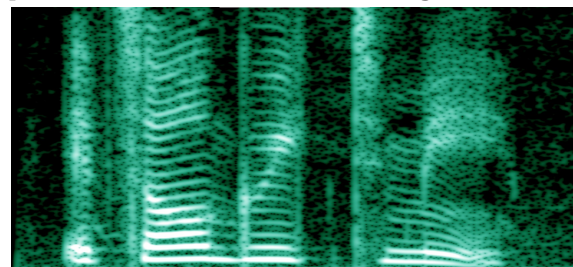


Figure 2: The form of voice tag in humans

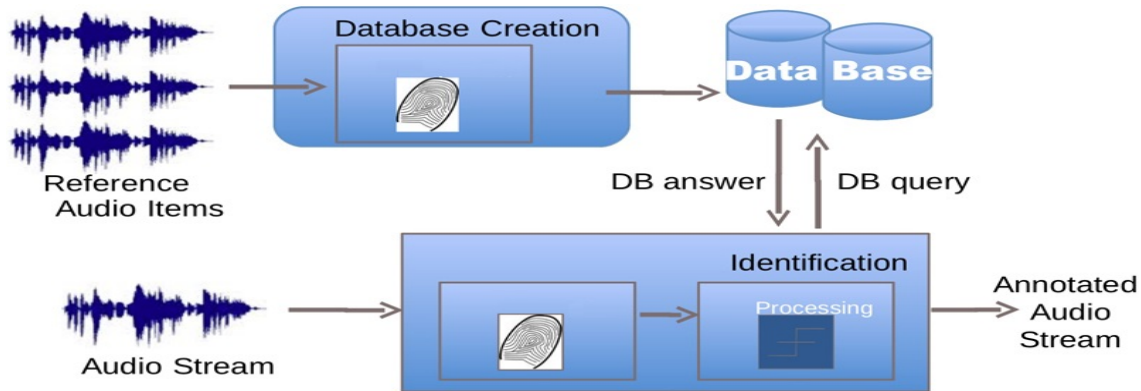


Figure 3: General outline the block to do the voice command

Related work:

Is an integrated circuit compressed microcontroller to receive voice commands are recorded and then stored in the memory assistance through the given orders from the program, and are giving something else to do on the orders of conformity and giving it adjusted a control required an output Speak to Control (Arduino compatible) Voice Recognition Module is a compact and easy-control speaking recognition board ,this product is a speaker-dependent voice recognition module. It supports up to 80 voice commands in all Max 7 voice commands could work at the same time. Any sound could be trained as command. Users need to train the module first before let it recognizing any voice command show fig 4

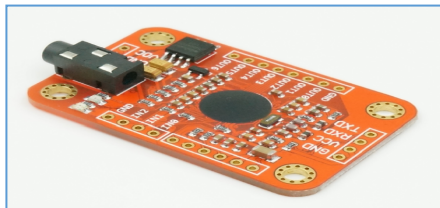


Figure 4: voice recognition module circuit

-Voice recognition platform:

Through this block diagram see fig 5 is clarified two operations:

-Audio recording of the user and Verification and matching process.

Here are the sound discovery in (endpoint detection) and convert it into an electrical signal , And then the noise is removed by using a specific noise (noise elimination), Here the signal is either ready for registration and verification, According to the code, here are the registration process and get the voice of the store model is ready for comparison with any sound at any time see figure 5.

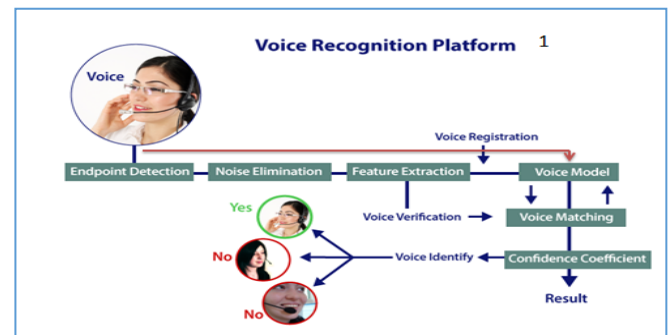


Figure5: The signal path in the audio recording process

Verification and matching process:

Here are the audio receiver and converted into an electrical signal and then remove noise, Then according to the command given to the microcontroller a match is made between the new sound and the stored sound

inside (voice matching) in the microcontroller, Note through a form that there is more than one person has been their refusal for not matching their voice with the sound stored [4.5.6].

- The process is controlled by voice using Arduino:

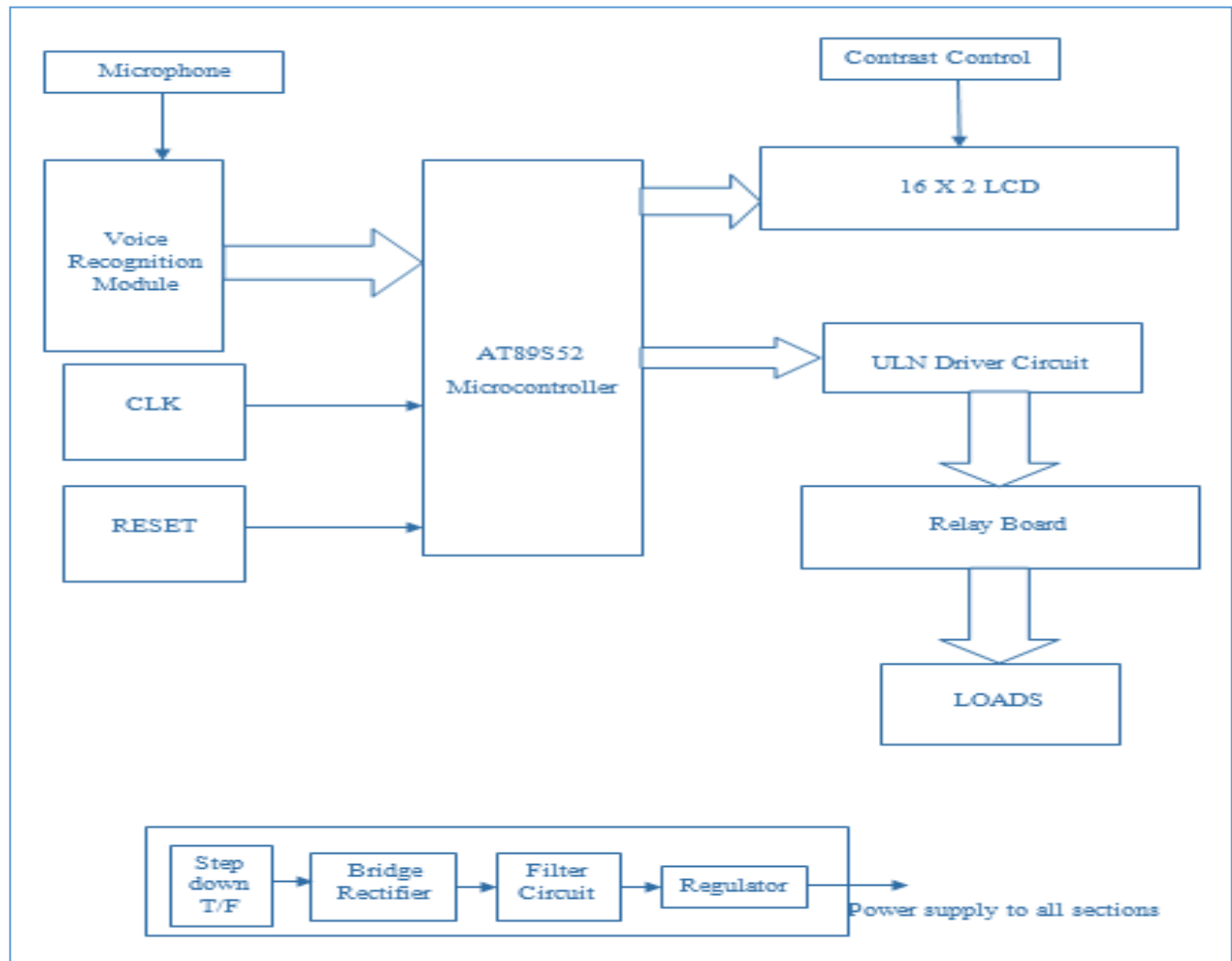


Figure 6: The block diagram of the process is controlled by voice using Arduino

Through this block diagram is clarified two operations:-

- 1- Audio recording of the user.
- 2- Verification and matching process.

Audio recording of the user:

Registration required voice commands using the tone of voice of the user personally so that the sound is transforming into an electrical signal using a microphone connected with the module Voice recognition module It works to

convert electrical signals received from analog to digital is then converted into a

binary counting system and then to hexadecimal and then stores it in the memory module

After that we have a voice commands stored encrypted ready to be compared with any other orders. [7].

Verification and matching process:

Here are comparisons between the commands stored and new orders in the microcontroller, according to the microcontroller program is the comparison in terms of the length of a voice command and voice frequency in addition to the form of voice command and if the mismatch between the old orders and new orders are ordering the implementation of the microcontroller for some operations, according to it voice.

-16*2 LCD : Working on the show all the processes of registration and compared in addition to the operations that are performed

-Relay Board: it is used to control high currents through the voltage of Arduino.

-Loads: is a device It required to run or stop.

-Reset : It is working Clear of all the commands and code from the microcontroller

-power supply: Consisting of :

1-step down T/F: It is a transformer works on convert of high currents into low currents.

2-Bridge rectifier: It works to convert AC to DC .

3-Filter circuit: It is a filter capacitors we get from the output of the DC frequency equal to zero free of meandering.

4-Regulator: Voltage Regulator we get from the output on more of an voltage to feed all the circuit components [8].

2.1-Audio control circuit:

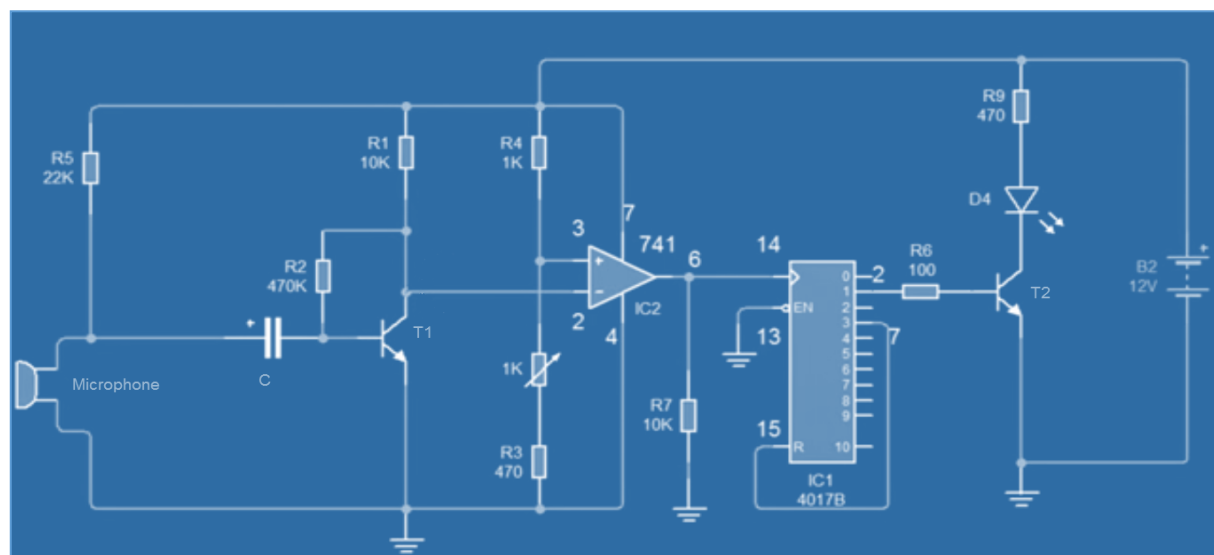


Figure 7: Control circuitry of LED (ON, OFF)

-The microphone is working to convert the audio signal to an electrical signal is then amplified in Transistor which works amplifier

first voice signal and then transmitted to note amplifier differentially you grow and given to the microcontroller, which works first on the

conversion from analog to digital and then extracted from the frequency and wavelength and shape of voice command and stores it all in the memory. Then when the

compliance is verified the things stored and give it either run or stop

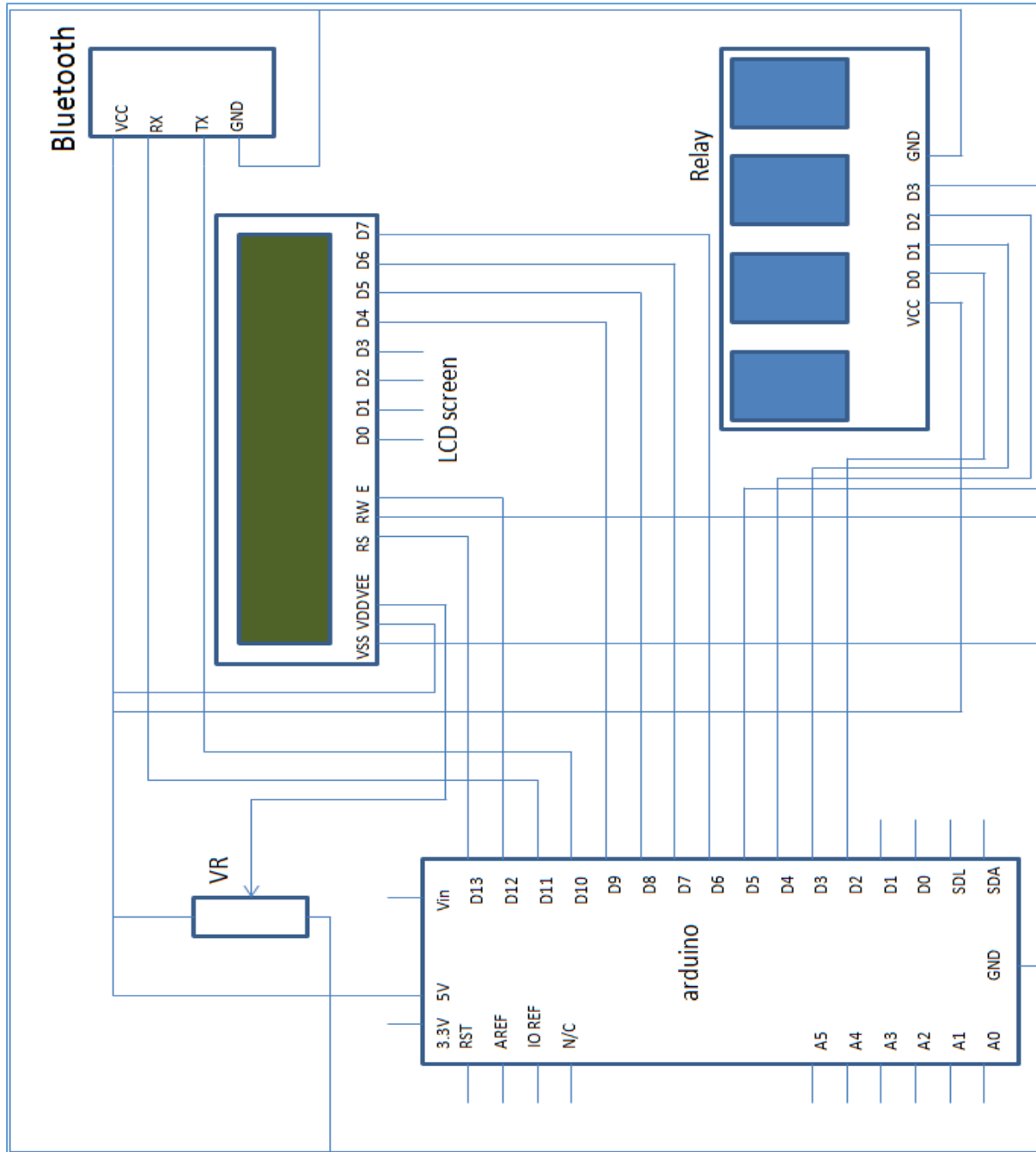


Figure 8: the form of circuit diagram

Through this device has been a mechanism to pursue the development, which is currently working on the development of human,

Principle of operation

where mobile phone usage and technologies instead of using modules which have efficiency the probability of their decline is very large, in the use of mobile phone and technology has been underestimated this bad component of a very large problem in this device. Where the use of the Bluetooth feature in the mobile phone as a property send only one direction through the application being downloaded from(App store , play store) The figure 26 shows the transmitter property of the phone. In this work, a microcontroller type(ATM32) which is the theme of arduino which is fed by adapter or battery and its feeding will be (12v), the arduino consists of a group of entrances and exits analog and digital I/O The device is also made of Bluetooth receiver for mobile phone signal ,figure 23 shows the Bluetooth model , where it consists of four poles one is VCC and one is GND (VCC=5v ,GND =0) , he also has two poles the first is transmitter and the second is receiver these electrodes are used to receive and transmit signals between the Bluetooth and the microcontroller they are connected TX to pin 10 and RX to pin 11 .

It also consists of the display screen, figure 24 shows the LCD screen , The screen is connected (VSS to GND and VDD to 5v and VEE to VR) , The variable resistance is used to control the brightness of the screen so as to conserve energy if the device is connected with a battery instead of an adapter and it is connected respectively(D4,D5,D6,D7)in pins of screen to pins (D6,D7,D8,D9) in digital i/o in arduino , through this screen is displayed what is turned on and off through a system understandable to the user and it is also controlled using the digital exits in relays , work OFF and ON in relay which in turn controls the electrical appliances that operation at 220V When you want to turn on

and turn off any device connected to the relay.

You must open the application and Bluetooth in the mobile phone then the work of coupling between Bluetooth module and the Bluetooth in mobile phone voice commands are then sent by pressing the button recording ,during this period he works as (Google Analytics Editor) which converts audio command to text then Bluetooth in mobile phone sends it to Bluetooth module , Bluetooth receives encrypted text ,this text is sent to the microcontroller , the microcontroller performs a matching between the first two texts in the controller and the second receiver of Bluetooth, if the two texts match each other, the controller gives the command to run to the digital outputs and gives a script command to run to the display screen[9.10].

The processes within the microcontroller are done using an integrated program to control everything:

Experiment and result:

- We were able to record voice commands on the device through voice recognition.
- We have to control three devices, stop and run and Each device needs to be a voice command to run and commanded to stop.
- To improve the work of the circuit we used a wireless microphone to help some of the people Is connected to the circuit near the desired operation and that are controlled through voice commands setups.
- The operation and control through a wireless microphone with instruments.

Conclusions

Through experiments conducted enable us to do some work on this project the mismatch control electrical appliances through voice commands remotely ,we also we connect the device to the gate of the house open and close automatically using voice commands, the device is also connected with the elevator to be summoned before remotely caller person has him up by his own voice command ,we also connect the device to a home lighting and control are running shut off through voice commands ,we can also connect this device to lock the safety lock is not open to through the user's voice command recorded .

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