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K. J. Somaiya Institute of Engineering & Information Technology, University of Mumbai, Maharashtra, India

Speech Recognition Bot

Atharva Pathak
Department of Electronics & Telecommunication, KJSIEIT
University of Mumbai
Mumbai, India
atharva.pathak@somaiya.edu

Dhaval Patel
Department of Electronics & Telecommunication, KJSIEIT
University of Mumbai
Mumbai, India
dhaval.ap@somaiya.edu

Bhavik Panchal
Department of Electronics & Telecommunication, KJSIEIT
University of MumbaiĀ
Mumbai, India
bhavik.mp@somaiya.edu

Rushabh Patel
Department of Electronics & Telecommunication, KJSIEIT
University of Mumbai
Mumbai, India
rushabh.patel@somaiya.edu

Prof. Rupali Kadu
Department of Electronics & Telecommunication, KJSIEIT
University of Mumbai
Mumbai, India
radvirkar@somaiya.edu

***Abstract*—Voice Controlled Bot (VCB) is a flexible bot whose gesture can be supervised by the authority using specific voice instructions. An Android device is used as a microphone. A Speech to Text conversion application for the recognition of voice signal is developed. This app is connected to the Bluetooth module contained in the bot. The Bluetooth module sends the command message to the robot's microcontroller. The microcontroller inspects the message and takes suitable actions. The aim is to implement a bot which is controlled by servo motors. The Speech Recognition Unit in the application converts the voice commands into digital signals. These text instructions are transmitted to the bot. On the recipient side, the Bluetooth module receives the command from the transmitter side and then carries out the respective functions. The Hardware microcontroller employed here is AT89s52. The voice recognition unit performs alone without the intelligence of the bot. The best part is that, it does not involve bot's main intelligence power. The software work is done in Keil software using Embedded C.**

Keywords— Bluetooth, Android Application, DC Servo motor, Speech Recognition, Voice Control.

Ⅰ. INTRODUCTION

In the present world technology has been at great excellence when it comes to bots, equipments, devices etc. Several technologies have come out into presence out of which one such is Speech recognition. Speech Controlled System basically works on the principle of Speech Recognition[2]. Speech recognition is the method which helps the machine interpret the words. Speech recognition is the most useful or efficient way to control any system. This idea can be used in several industries and labour sites where manual activities are taking place. In this system,initially the user's face will be detected using a camera module with the help of image processing. the same face will be saved and will be in further used for locking and unlocking the bot. Later on, using various voice recognition techniques, the voice of the user will be saved in the bot and the bot will act according to the commands. The controller will detect the speech and convert it to a digital information which can be read by the machine[1]. The Speech module used works distinctly from the main controller power unit. The main feature of this system is to convert any speech data to text and transmit it to the microcontroller using any communication module.The most distinct feature of this project is its programmability . User can program the module according to any unique command it wants to be recognized. One can program and function the SRC to recognize the unique command one wants to perform[6]. The communication can be easily interfaced to the bot's controller. If we want to control any event or perform any task using this speech recognition technique it will become very easy, robust and will consume less time.

Ⅱ. PROPOSED METHODOLOGY

The impetus behind the project is to assemble a mini-car which could be handled using speech. The vehicle build by us will not recognize a variety of keywords, we just want it to recognize some of the local words we use for direction.

Example of such words are as follows:

1. Move forward
2. Move back
3. Turn right
4. Turn left

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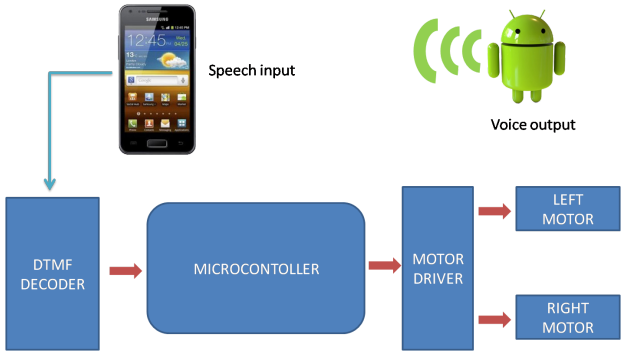

Fig. 1: Block Diagram of Voice Controlled Bot

1. Hardware

1.1 HC-05 Bluetooth Module:

HC-05 Bluetooth Module is and the module which is used for SPP(Serial Port Protocol) module[1]. It is used for unwired communication. It is basically a Master-Slave Configuration. It works at a data rate of 3 Mbps at 2.4GHz radio transceiver.

1.2 USBasp Programmer:

USBasp programmer is made up of some passive elements as well as the ATMega8 microcontroller[3]. It is to be aligned before its real-time exercise. It needs only firmware-only USB and any distinct USB controller is not needed.

1.3 DC Motors:

It is basically a motor that converts electrical energy into mechanical energy. A DC motor's speed is managed by varying the supply voltage or by changing the strength of the current in field winding.

2. Software

2.1 Keil Software:

Keil MDK is basically a software development environment for various microcontroller devices. It offers broad domain of tools like ANSI C compiler, debuggers and simulators, linkers, library managers, real time operating systems, etc[4].

2.2 Speech Recognition Application:

These days android phones are developed with an inbuilt speech to text conversion mechanism. The input speech is streamed on a server for converting it to text and the content is given back to our application[5]. Later on, using the Android's Bluetooth, the converted text is sent to the Bluetooth module assembled on the robot for further process.

Ⅲ. ALGORITHM

1. Start.
2. Recognize user's image using image processing technique.
3. Save the image for current use and further for locking and unlocking the bot.
4. Recognize the voice of the user.
5. Establishment of connection between Android & Bluetooth module.
6. Input commands to the Android to perform functions.
7. Conversion of speech to binary values.
8. Transfer of commands from Android to Bluetooth module.
9. Microcontroller will receive data and carry out functions accordingly.
10. Stop.

Ⅳ. FLOWCHART

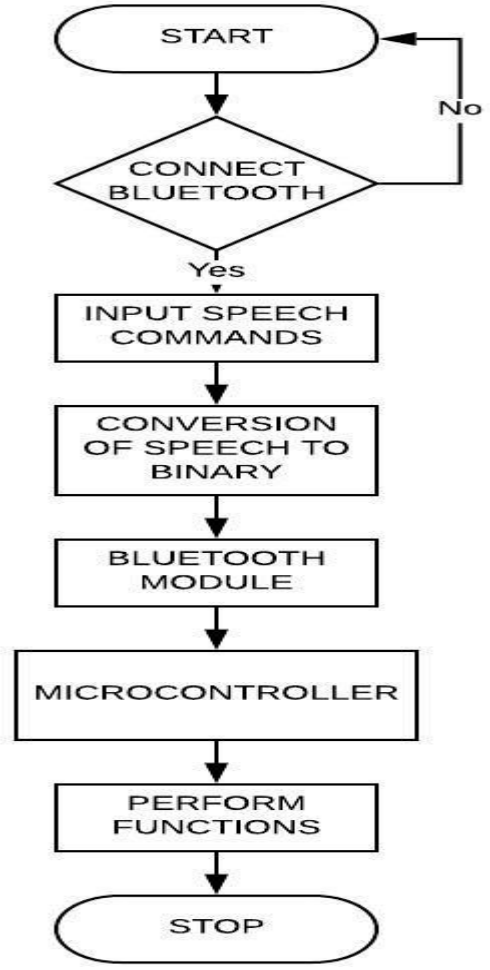

Fig. 2: Flowchart of Speech Recognition Bot

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V. APPLICATIONS

1. It helps physically challenged people to carry some objects from one place to another place using the arm structure in the robot.
2. It can assist a visually impaired person to reach the terminus by using the vocalizing feature.
3. It helps to guide visitors in an association by providing information about the services available.
4. Time-based control is possible because of Real-time Clock (DS1307).
5. It can be used in menacing locations where humans cannot reach.
6. Voice controlled robot vehicle has significant application in industries where a user is able to control the robotic vehicle via voice commands.

VI. FUTURE SCOPE

1. This study work has been narrowed down to a concise range Bluetooth module. Employing a wide-range module can ensure large connectivity.
2. Power Optimization such as sleep and wakeup plans can be incorporated.
3. The concept of Image processing can be executed in the robot to recognize variations in color and different objects.
4. For more precise working servo motors can be deployed.

VII. RESULT & CONCLUSION

The voice recognition application has a decent accuracy in properly recognizing a voice command. In short, we can deduce the discussion to the point that speech recognition bots are the future market for many commercial and household purposes related to presetting daily tasks. After many tests our recommended method of Bluetooth communication functioned efficiently with a tolerable time interval. The connections between the microcontroller and Bluetooth operated quite fine with a few inaccuracies in recognition of voice instructions. We used MIT App Inventor tool for the application which uses packet data to identify the commands and bond it to microcontroller. But for forthcoming alterations we can produce an offline system for the application to detect voice and send it to microcontroller. A few amendments in the components used can result in a much more intelligibility of voice recognition.

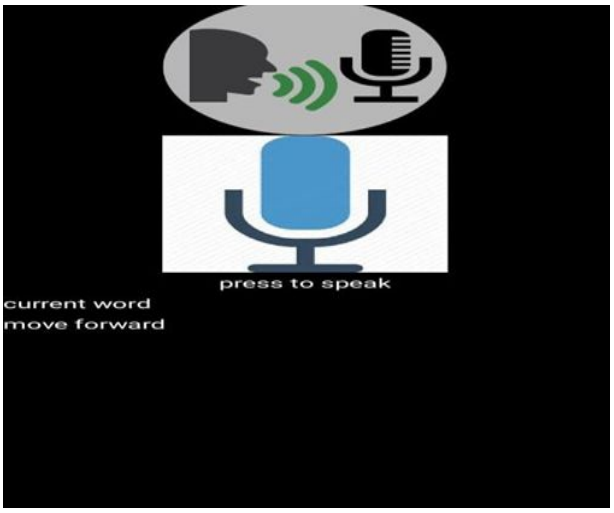

Fig. 3: Speech to Text Conversion Application

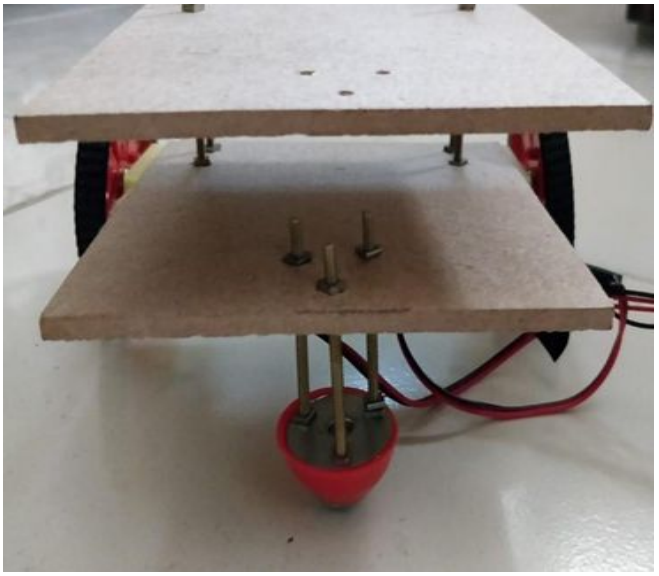

Fig. 4: Robotic Vehicle

VIII. REFERENCES

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