

SPEECH RECOGNITION MODULE USING ARDUINO

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ABSTRACT-Tremendous research has been done on speech processing applications, especially speech recognition. Based on the voice as the research object which allows the machine to turn the speech signal into text or commands through the process of understanding and identification, and also it makes the function of natural voice communication. Speech recognition implicates many fields of physiology, Psychology, linguistics, Computer science and signal processing, and is related to the person's body language. The ultimate goal is to achieve the natural language communication between human and machine. This paper comprises a module of ASR (Automatic Speech Recognition) using Arduino and BitVoicer.

Keywords- Speech, Arduino, BitVoicer, Automatic Speech Recognition, Natural Language

I. INTRODUCTION

Speech recognition is an interdisciplinary subfield of computer science and computational linguistics that develops methodologies and technologies that enable the recognition and translation of spoken language into text by computers.

In this Project Speech Recognition is implemented with a Microprocessor called Arduino DUE Board and to control LED's by using human vocal communication attested with a Speech Software.

The main goal of this project is to control the LED's using a person's Speech command. This Module initially works with the Microprocessor Module called Aduino Board and a Special Software which is an Application of Speech Recognition called BitVoicer. BitVoicer is a speech recognition application that enables simple devices, with low processing power, to become voice-operated. To do that, BitVoicer uses the PC processing power to analyze audio streams, identify the sentences present in these streams and send commands to a microcontroller connected to it. These Modules helps to implement a Person's Speech and to Recognize it. Initially an Arduino DUE Board (ESP8266) is initiated and Connected to a System. Then the BitVoicer is Installed in that System and Connected to the Arduino module. These operations are done using a Software called Arduino IDE. The Arduino Integrated Development Environment (IDE) is a cross-platform application

(for Windows, macOS, Linux) that is written in functions from C and C++. ... The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. The Arduino board is connected to a computer via USB, where it connects with the Arduino development environment (IDE). The user writes the Arduino code in the IDE, then uploads it to the microcontroller which executes the code, interacting with inputs and outputs such as sensors, motors, and lights. In this module the LED's are controlled by the users Voice Commands and it acts based on the Command. The user will give his command to Arduino and it will operate by using the Bitvoicer and hence finally the LED's performs according the user's commands.

II.SYSTEM ANALYSIS

System Analysis is a process by which we attribute process or goals to a human activity, determine how well those purposes are being achieved and specify the requirements of the various tools and techniques that are to be used within the system if the system performances are to be achieved.

A. EXISTING SYSTEM

The current Speech Recognition Techniques are not able to match and fulfil the requirements of the user/developer. The Main Dis-Advantage of the Existing System is it does not support all the connectable devices and customization was difficult. Hence, those projects are developed to its next state.

B. PROPOSED SYSTEM

The development of the new system contains the following activities, which able any user to control the Microprocessor or any other device through his/her voice and speech. This project will overcome all the previous faults and it will fulfil the user's requirements.

This project will be initialized through various new technologies and software's which bind to its new features and will be very useful to the Technical world.

C. SYSTEM REQUIREMENT:

a) HARDWARE REQUIREMENTS:

- Processor : Intel Pentium IV
- RAM : 4-6 GB

- Monitor : 17 inch Colour Monitor
- Keyboard : 108 Keys
- Mouse : Optical Mouse
- Hard Disk : 1 TB
- Other Hardware Requirements
- Microprocessor : Arduino DUE(ESP8266)
- Microphone : Spark-fun Electret Breakout Microphone
- Wires (both male and female joints)
- Colour LED's
- 330 OHM Resistors
- Bread Board (Mini)

b) SOFTWARE REQUIREMENTS:

- Front End/Language : Arduino Sketch-C/C++
- Back End/Speech Software : BitVoicer
- Operating System : Windows 7/10

III.IMPLEMENTATION

A. MODULE DESCRIPTION

A "module" in an open-project is a high-level description of a functional area, consisting of a group of processes describing the functionality of the module and a group of packages implementing the functionality.

a) SOFTWARE MODULE DESCRIPTION

ARDUINO IDE:

- Install and Run Arduino IDE
- Click New Sketch in File Menu
- Complete the required coding for LED control
- Compile the Code
- Set the code ready to Upload

BIT VOICER:

- Install and Run Bitvoicer from BitSophia Technology
- Click Add new Sentences
- Give the required commands as sentences in the sentence box
- Set the type of the inputs
- Load the sentences
- Start execution-
- Give the Commands as per sentences
- Stop

b) Hardware Module Description:

Entire Module Description:

- Take the small size Bread Board and place it centre
- Connect the Arduino DUE to the Board
- Initialize the Arduino Kit by connecting it to the system
- Boot the Initializing Program
- Connect the other parts of the module like Ohm resistor, LED's and Microphone
- Boot the required programs for the module

- Connect a Backup device for saving the data's
- Start the process
- Stop

IV. SYSTEM DESIGN

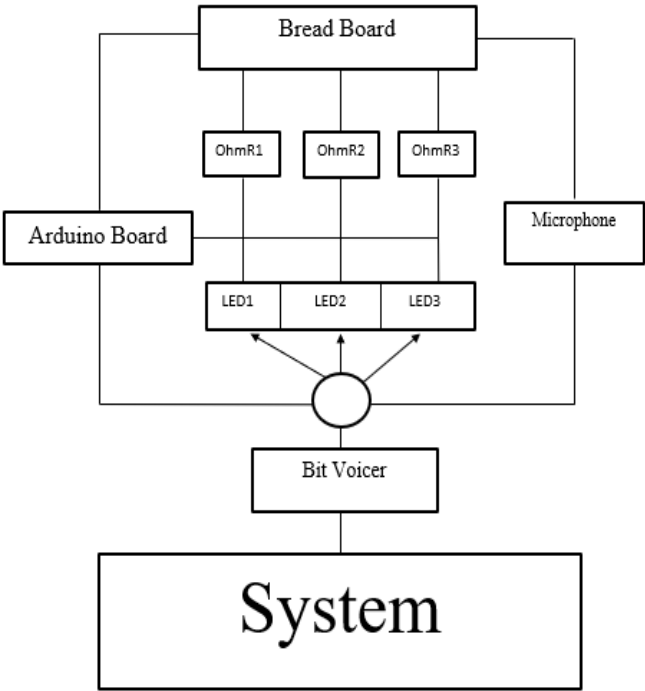


Fig. 1. Flow design

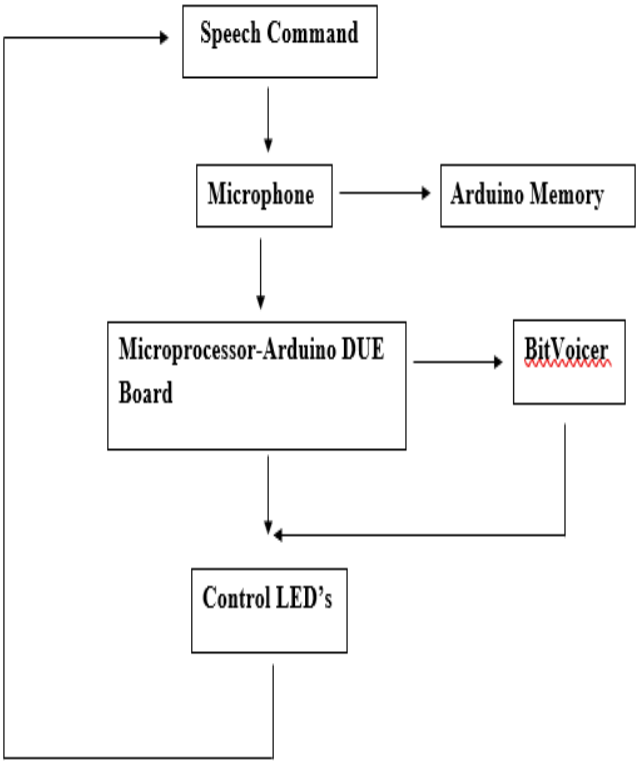


Fig.2. Circuit design

V.FUTURE WORKS

The Analysis on Speech Recognition using Arduino can be even more developed by using the Machine Learning techniques,

Speaker Identification Robot using Artificial Intelligence:

In this system, we are going to implement even more technologies to build up its state by using various domains like Artificial Intelligence by developing a **Robotic Attendance Module**. This will improve the Security level of technologies to the next step.

Hence, our Future Enhancements which will lead to a Major Improvement in Current Technological World.

VI.CONCLUSION

Thus, the Speech Recognition module using Arduino has proved to be more effective and efficient in which it fulfilled all the user requirements which helps us to develop more in future works.

This module proved good for me as it provided practical knowledge of not only programming in HTML, C++ skills and now some extent knowledge about Arduino and Speech Recognition system, but also about all handling procedure related with "SPEECH RECOGNITION MODULE USING ARDUINO". It also provides knowledge about the latest technology used in developing Speech enabled application and Speech based technology that will be great demand in future. This will provide better opportunities and guidance in future in developing projects independently. This Project helps various domains of the latest technologies which are ready to build up the current fields to higher range.

This easily interrupts to the Current field of technology to its next level. Even more the main domain of this module is "Artificial Intelligence", Because speech is the important aspect of AI. Easier and faster Speech technologies could be developed and make it possible for all fields. This gives us better opportunities in the Internet Technology fields and give a guidance in future in developing projects independently.

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