



JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

AI VIRTUAL ASSISTANT FOR WINDOWS AND FOR HOME AUTOMATION

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Abstract : The main aim of the work is to develop an economically effective and performance wise efficient virtual assistant for windows and for home automation based on the concepts of Internet of Things, Speech Recognition, Natural Language Processing and Artificial Intelligence. People who are using it can give voice inputs and the device itself responds through voice commands by itself. It can fetch the date, time, weather, play your favorite music and fetch search results from the internet along with controlling the home appliances. Python module like pyttsx3 play a major role in converting text to speech, The NLP artificial intelligence algorithm allows computer to communicate with human language. This project mainly involves software components so the hardware cost is reduced.

Keywords: Natural Language Processing, Speech Recognition, Voice Command.

I. INTRODUCTION

In today's world all tasks are computerized. We have mobile phones in our hands and it is nothing less than having world at your finger tips. These days we just use voice to complete our tasks. This is due to the invention of virtual assistants. And we can say it is the peak of human technology. This project is constructed based on the basic concepts on Internet of things (IOT) and Natural Language Processing (NLP). We have put forth a method to integrate all the home appliances through a central command center. This will eventually reduce the human interaction with the appliances and make the work easier. This system is designed to provide a user friendly experience as well as an easier interface so that anyone can use this effortlessly. The project is implemented on windows system. The python language is used as the main programming language. All necessary modules of python like Pyttsx3, Tkinter and python date time should be installed for the effective working of the project. The hardware access is made through arduino Bridge to control arduino using voice. Natural Language Processing is simply a bridge-way that reduces the distance between human communication and machine communication. The main objective of NLP is to make the machines understand the natural human language so that the usage becomes very much comfortable. In technical terms, NLP is the algorithm which analyzes and synthesizes human speech. This algorithm is based on artificial intelligence and computational linguistics.

II. LITERATURE SURVEY

MugdhaBapat, Pushpak Bhattacharyya, " morphological analyzer for most of the NLP solicitations of Indian Languages", 2015. [1]

During the work they described and estimated the morphological analyzer for Marathi language. They started by planning a to some extent homomorphism "boos trappable" encryption technique that functions during the function f is the techniques individual decryption function. The research showed a great accuracy for Marathi that adventures consistency in inflectional standards in engaging the Finite State Systems for demonstrating language in a sophisticated way.

Although Bangla is among the most spoken languages around the globe, some of the few works of Bangla ASR can be identified in the collected works, particularly Bangla accented in Bangladeshi. During this research, the quantity is gathered from the public in Bangladesh. Mel-frequency cepstral coefficients (MFCCs) dependent characteristics and hidden Markov model (HMM) dependent classifiers are utilized for identification. Dialectical variance makes happen a part of performance deprivation.

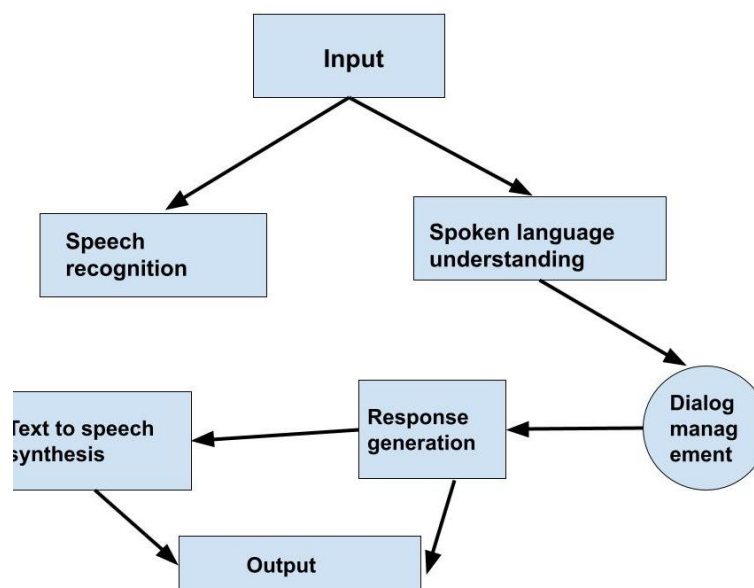
Dr.Kshama V. Kulhalli proposed the Most famous application of iPhone is “SIRI”,2017.[3]

This paper describes the Virtual assistant that helps the end user to communicate end user mobile with voice and it also responds to the voice commands of the user. Same kind of application is also developed by Google that is “Google Voice Search” which is used for Android Phones. But this Application mostly works with Internet Connections. But our Proposed System has capability to work with and without Internet Connectivity.

III.PROPOSED METHOD

The framework of the proposed project is the windows computer. The voice command is given as an input,the voice command is converted into string format by STT module which contains NLP algorithm,The NLP algorithm compares the given voice input to existing texts in the database.The recognized voice is converted into text (string) format to perform tasks,The tasks are done using the modules like pyttsx3,urlib,webbrowser,pyautogui,wikipedia.All the modules can be installed using the command [pip install x]in the command prompt.If the modules are already present it throws an error modules are already present. If a command search is given the NLP algorithm detects the speech and the text to speech module gives the command “what do you want to search”,we have to give the command which we have to search,the program initiate and starts to search the command which we provided.we can also use this virtual assistant to control LED lights by simply commanding lights on and of.This is done by using arduino and arduino interface in python.

IV.BLOCK DIAGRAM



MODULES DESCRIPTION

A module is a software component or part of a program that contains single or multiple routines.The project “Virtual assistant for windows and for home automation” consists of two main modules they are

- Hardware
- Software

SAPI5

Sapi5 is the microsoft speech application programming interface,the sapi5 contains both male and female voices,It acts as a TTS engine converting generated string text into voice.The speed of the voice can be controlled using the elements in the subprocess module.

RAM

The working system has 4 GB DDR3 memory and with a speed of 1600 Ghz. Normally 79 MB is used for hardware reserve. The arduino uno consists of 8k bytes SRAM and 256k bytes of flash ram. The 0.5k flash memory is reserved for the bootloader.

TEXT TO SPEECH CONVERTER

The Pyttsx3 module is known as text to speech converter. The pyttsx3 module works in python versions 2.7 and 3 series versions. The Pyttsx3 module works offline and doesn't require internet connection, it is better to work with later versions of this module for better performance. To upgrade one can simply visit python website and download the latest version.

Features:

- Common sampling frequencies include 8khz and 44.1khz.
- The audio signals have quantization range from -214 to 215
- The human audio perception for adults ranges from 85hz - 255hz

V.RESULTS AND DISCUSSION

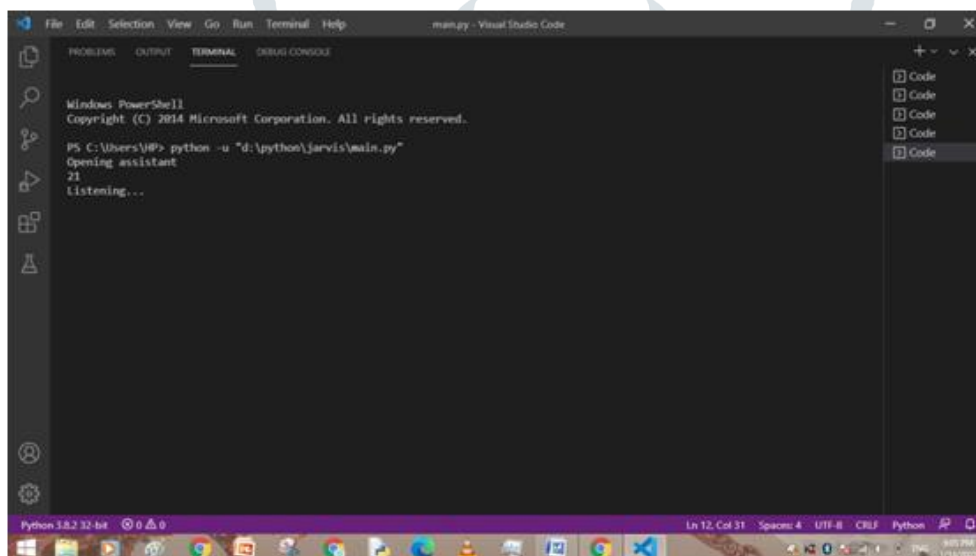


Fig.2. Listening

The program is initiated and it waits for the user to provide input, if there is an issue in the program it throws an error as something went wrong.

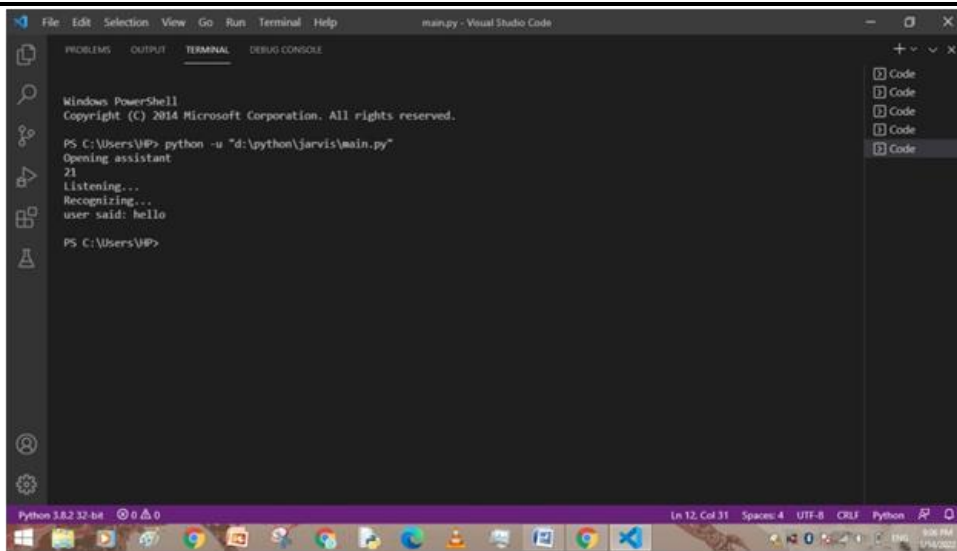


Fig.3. Recognizing Command

The voice is recognized and converted into string text, As of this scenario the user said hello, the voice is recognized and displayed as text.

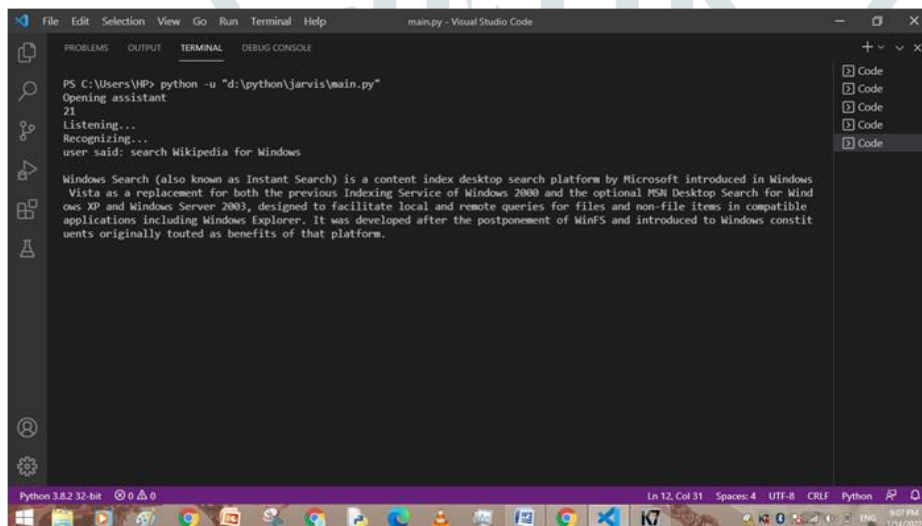


Fig.4. Searching wikipedia

When the command search wikipedia is given, The details of certain wikipedia search is obtained and displayed and the program reads the result, this is done with the help of wikipedia module.

VI. CONCLUSION & FUTURE WORK

This project implemented Ai virtual assistant for windows. The results have been successfully verified and the hardware output has been tested using different scenarios. This project software successfully takes the command and responds the expected result. The location search by using voice, the google search for certain query and opening of applications are performing well. This project is cost efficient and requires less hardware components. However the working completely depends on the internet connection and less noise. The future project have been planned to implement algorithms for noise cancellation and implementing algorithms to make virtual assistant work offline.

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