IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Virtual Voice Assistant

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Abstract: The project aims to develop a personal virtual voice assistant for windows based system. Jarvis draws its inspiration from virtual voice assistants like cortana for windows, and siri for ios. It has been designed ton provide a user-friendly interface for carrying out a variety of tasks by employing certain well-defined commands. Users can interact with the assistant ,jarvis assists the end-user with day-to-day activities like general human conversation, searching queries in google or yahoo, searching for videos, playing songs, live weather conditions, word meanings, searching for medicine details and reminding the user about the scheduled events and tasks. The virtual voice assistant takes the voice input through our microphone and it coverts our voice into computer understandable language and gives the required solutions and answers which are asked by the user. The assistant connects with the world wide web to provide results that the user has questioned. This project works on voice input and gives output through voice and displays the text on the screen. The main agenda of our virtual assistant is that it makes people smart and gives instant and computed results

I. INTRODUCTION

OVERVIEW : The development of technology allows introducing more advanced solutions in everyday life. This makes work less exhausting for employees, and also increases the work safety. As the technology is developing day by day people are becoming more dependent on it, one of the mostly used platform is computer. We all want to make the use of these computers more comfortable, traditional way to give a command to the computer is through keyboard but a more convenient way is to input the command through voice. Giving input through voice is not only beneficial for the normal people but also for those who are visually impaired who are not able to give the input by using a keyboard. For this purpose, there is a need of a virtual assistant which can not only take command through voice but also execute the desired instructions and give output either in the form of voice or any other means.

MOTIVATION: The main purpose of this project is to build a program that will be able to service to humans like a personal assistant. This is an interesting concept and many people around the globe are working it. Today, time and security are the two main things to which people are more sensitive, no one has the time to spoil; nobody would like their security breach, and this project is mainly for those kinds of people. This system is designed to be used efficiently on desktops. Virtual Assistants software improves user productivity by managing routine tasks of the user and by providing information from an online source to the user. This project was started on the premise that there is a sufficient amount of openly available data and information on the web that can be utilized to build a virtual assistant that has access to making intelligent decisions for routine user activities.

SCOPE OF THE PROJECT: Virtual Assistants will continue to offer more individualized experiences as they get better at differentiating between voices. However, it's not just developers that need to address the complexity of developing for voice as brands also need to understand the capabilities of each device and integration and if it makes sense for their specific brand. They will also need to focus on maintaining a user experience that is consistent within the coming years as complexity becomes more of a concern. This is because the visual interface with virtual assistants is missing. Users simply cannot see or touch a voice interface. Virtual Assistants are software programs that help you ease your day-today tasks, such as showing weather report, playing music etc. They can take commands via text (online chat bots) or by voice.

APPLICABILITY: The shift towards voice. The number of IoT devices such as smart thermostats and speakers are giving voice assistants more utility in a connected user's life. Smart speakers are the number one way we are seeing voice being used. Many industry experts even predict that nearly every application will integrate voice technology in some way in the next 5 years. The use of virtual assistants can also enhance the system of lot (internet of things). Twenty years from now, Microsoft and its competitors will be offering personal digital assistants that will offer the services of a full-time employee usually reserved for the rich and famous. .

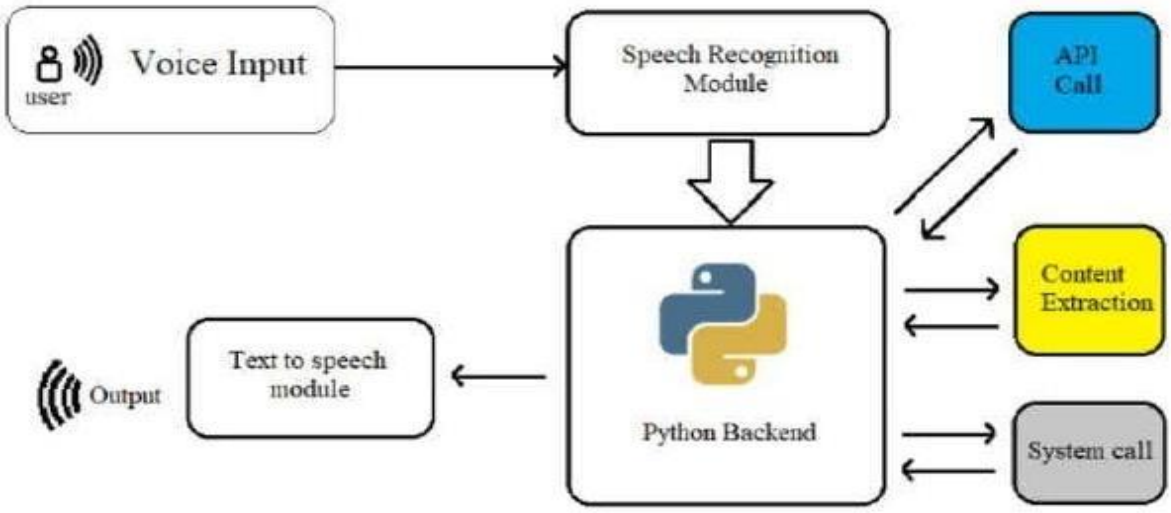

Figure 1.1: Virtual Assistant

2. LITERATURE SURVEY:

This field of virtual assistants having speech recognition has seen some major advancements or innovations. This is mainly because of its demand in devices like smart watches or fitness bands, speakers, Bluetooth earphones, mobile phones, laptop or desktop, television, etc. Almost all the digital devices which are coming nowadays are coming with voice assistants which help to control the device with speech recognition only. A new set of techniques is being developed constantly to improve the performance of voice automated search.

As the amount of data is increasing exponentially now known as Big Data the best way to improve the results of virtual assistants is to incorporate our assistants with machine learning and train our devices according to their uses. Other major techniques that are equally important are Artificial Intelligence, Internet of Things, Big Data access and management, etc. With the use of voice assistants, we can automate the task easily, just give the input to the machine in the speech form and all the tasks will be done by it from converting your speech into text form to taking out keywords from that text and execute the query to give results to the user.

Machine Learning is just a subset of Artificial Intelligence. This has been one of the most helpful advancements in technology. Before AI we were the ones who were upgrading technology to do a task but now the machine is itself able to counter new tasks and solve it without need to involve the humans to evolve it.

- **Nivedita Singh (2021)** et al. proposed a voice assistant using python speech to text (STT) module and had performed some api calls and system calls which has led to developing a voice assistant using python which allows the user to 4run any type of command through voice without interaction of keyboard. This can also run on hybrid platforms. Therefore, this paper lacks in some parts like the system calls that aren't much supported.

- **Abeed Sayyed (2021**) et al. presented a paper on Desktop Assistant AI using python with IOT features and also used Artificial Intelligence (AI) features along with a SQLite DB with the use of Python. This Project has a Database connection and a query framework but lacks API call and System calls features.

- **P. Krishna raj (2021)** et al. presented a project on Portable Voice Recognition with GUI Automation, This system uses Google's online speech recognition system for converting speech input to text along with Python. Therefore, this project has a GUI and is also has a portable framework. Accuracy of this text to speech (TTS) engine is comparatively less and also lacks IoT.

PROPOSED SYSTEM :

1. Queries from the Web: Making queries is an essential part of one's life. We have addressed the essential part of a netizen's life by enabling our voice assistant to search the web. Virtual Assistant supports a plethora of search engine like Google displays the result by scraping the searched queries.
2. Accessing News: Being up-to-date in this modern world is very much important. In that way news plays a big crucial role in keeping ourselves updated. News keeps you informed and also helps in spreading knowledge.
3. To Search Something on Wikipedia: Wikipedia's purpose is to benefit readers by acting as a widely accessible and free encyclopaedia a comprehensive written compendium that contains information on all branches of knowledge.
4. Opening Code Editor: Virtual Assistant is capable of opening your code editor or IDE with a single voice command.
5. Accessing Music Playlist: Music have remained as a main source of entertainment, one of the most prioritized tasks of virtual assistants. you can play any song of your choice. However, you can also play a random song with the help of a random module. Every time you command to play music, the Virtual Assistant will play any random song from the songdirectory

3. METHODOLOGY:

3.1 OBJECTIVE OF THE PROJECT

Main objective of building personal assistant software (a virtual assistant) is using semantic data sources available on the web, user generated content and providing knowledge from knowledge databases. The main purpose of an intelligent virtual assistant is to answer questions that users may have. This may be done in a business environment, for example, on the business website, with a chat interface. On the mobile platform, the intelligent virtual assistant is available as a call-button operated service where a voice asks the user "What can I do for you?" and then responds to verbal input. Virtual assistants can tremendously save you time. We spend hours in online research and then making the report in our terms of understanding.

Provide a topic for research and continue with your tasks while the assistant does the research. Another difficult task is to remember test dates, birthdates or anniversaries. It comes with a surprise when you enter the class and realize it is classtest today. Just tell assistant in advance about your tests and she reminds you well in advance so you can prepare for the test. One of the main advantages of voice searches is their rapidity. In fact, voice is reputed to be four times faster than a written search: whereas we can write about 40 words per minute, we are capable of speaking around 150 during the same period of time. In this respect, the ability of personal assistants to accurately recognize spoken words is a prerequisite for them to be adopted by consumers.

3.2 SYSTEM ARCHITECTURE

An architectural diagram is a diagram of a system that is used to abstract the overall outline of the software system and the relationships, constraints, and boundaries between components. It is an important tool as it provides an overall view of the physical deployment of the software system and its evolution roadmap. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. After going through the above process, we have successfully enabled the model to understand the features

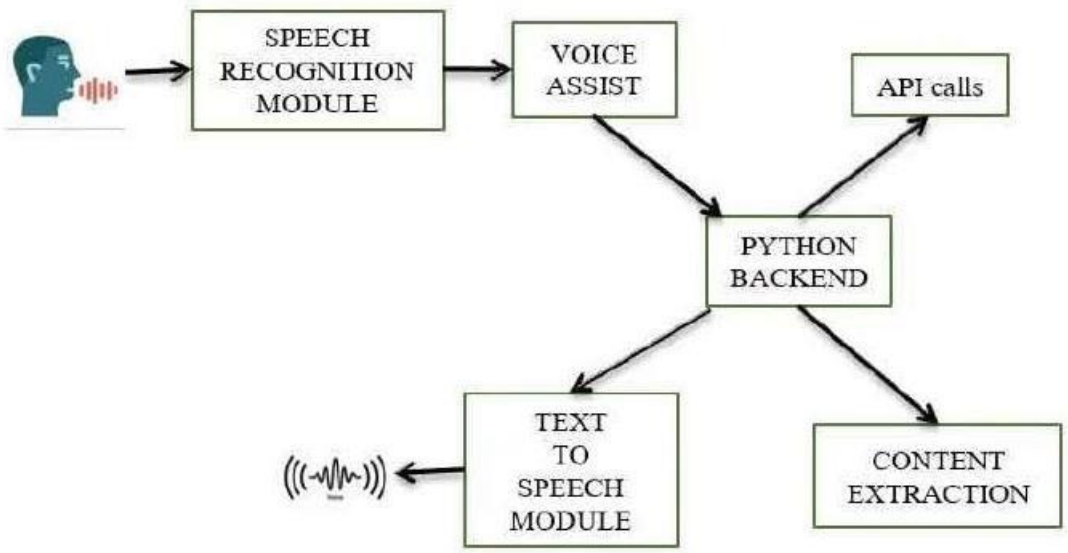

FIGURE 3.1 SYSTEM ARCHITECTURE

4. IMPLEMENTATION

4.1 MODULE DESCRIPTION

- **Pyttsx3 (Python Text to Speech)**

A python library that will help us to convert text to speech. It is a cross-platform Python wrapper for text-to-speech synthesis. It is a Python package supporting common textto-speech engines on MacOS X, Windows, and Linux. It works for both Python2.x and 3.x versions. Its main advantage is that it works offline.

- **Sapi5 (Speech Application Programming Interface)**

The Speech Application Programming Interface or SAPI is an API developed by Microsoft to allow the use of speech recognition and speech synthesis within Windows applications. To date, a number of versions of the API have been released. which have shipped either as part of a Speech SDK, or as part of the Windows OS itself. Applications that use SAPI include Microsoft Office, Microsoft Agent and Microsoft Speech Server. Many versions (although not all) of the speech recognition and synthesis engines are also freely redistributable. SAPI 5 however was a completely new interface, released in 2000. Since, then several sub-versions of this API have been released.

- **Speech recognition**

Speech recognition is the process of converting spoken words to text. Python supports many speech recognition engines and APIs, including Google Speech Engine, Google Cloud Speech API, Microsoft Bing Voice Recognition and IBM Speech to Text. Speech Recognition is an important feature in several applications used such as home automation, artificial intelligence, etc. Recognizing speech needs audio input, and Speech Recognition makes it really simple to retrieve this input. This is a library for performing speech recognition, with support for several engines and APIs, online and offline.

- **Pyaudio**

To access your microphone with Speech Recognizer, you'll have to install the PyAudio package. PyAudio provides Python bindings for Port Audio, the crossplatform audio I/O library. With PyAudio, you can easily use Python to play and record audio on a varity of platforms.

- **Wikipedia**

Wikipedia is a Python library that makes it easy to access and parse data from Wikipedia. It gets article summaries, get data like links and images from a page, and more. This module provides developers code-level access to the entire Wikipedia reference.

- **Webbrowser**

The webbrowser module provides a high-level interface to allow displaying Webbased documents to users. Under most circumstances, simply calling the open() function from this module will do the right thing

CONCLUSION

Through this virtual assistant, we have automated various services using a single line command. It eases most of the tasks of the user like searching the web, playing music and doing Wikipedia searches. We aim to make this project a complete server assistant and make it smart enough to act as a replacement for a general server administration. The project is built using available open-source software modules with visual studio code community backing which can accommodate any updates in future. The modular nature of this project makes it more flexible and easier to add additional features without disturbing current system functionalities. It not only works on human commands but also give responses to the user based on the query being asked or the words spoken by the user such as opening tasks and operations. The application should also eliminate any kind of unnecessary manual work required in the user life of performing every task.

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