Voice Activated Intelligent Assistant Using ML

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ABSTRACT

As we know Python is an emerging language so it becomes easy to write a script for Voice Assistant in Python. The instructions for the assistant can be handled as per the requirement of user. Speech recognition is the process of converting speech into text. This is commonly used in voice assistants like Alexa, Siri, etc. In Python there is an API called **SpeechRecognition** which allows us to convert speech into text. It was an interesting task to make my own assistant. It became easier to send emails without typing any word, Searching on Google without opening the browser, and performing many other daily tasks like playing music, opening your favorite IDE with the help of a single voice command. In the current scenario, advancement in technologies are such that they can perform any task with same effectiveness or can say more effectively than us. By making this project, I realized that the concept of AI in every field is decreasing human effort and saving time.

Keyword - : Laptop Device, Python's Speech Recognition, Python text-to-speech library pyttsx3, Python3.8

1. Introduction

Artificial Intelligence when used with machines, it shows us the capability of thinking like humans. In this, a computer system is designed in such a way that typically requires interaction from human. As we know Python is an emerging language so it becomes easy to write a script for Voice Assistant in Python. The instructions for the assistant can be handled as per the requirement of user. Speech recognition is the Alexa, Siri, etc. In Python there is an API called Speech Recognition which allows us to convert speech into text. It was an interesting task to make my own assistant. It became easier to send emails without typing any word, Searching on Google without opening the browser, and performing many other daily tasks like playing music, opening your favorite IDE with the help of a single voice command. In the current scenario, advancement in technologies are such that they can perform any task with same effectiveness or can say more effectively than us. By making this project, I realized that the concept of AI in every field is decreasing human effort and saving time. As the voice assistant is using Artificial Intelligence hence the result that it is providing are highly accurate and efficient.

The assistant can help to reduce human effort and consumes time while performing any task, they removed the concept of typing completely and behave as another individual to whom we are talking and asking to perform task. The assistant is no less than a human assistant but we can say that this is more effective and efficient to perform any task. The libraries and packages used to make this assistant focuses on the time complexities and reduces time. The functionalities include, It can Shut down, Restart & Sleep PC, It can showing IP Address, It can send text on WhatsApp, It can open command prompt, your favorite IDE, notepad etc., It can play music, It can do Wikipedia searches for you, It can open websites like Google, YouTube, etc., in a web browser, It can give weather forecast, It can give desktop reminders of your choice. It can have some basic conversation. Tools and technologies used are Visual Studio or Python IDE for making this project, and I created all py files in Visual Studio. Along with

this I used following modules and libraries in my project. pyttsx3, SpeechRecognition, Datetime, Wikipedia, Smtplib, pywhatkit, pyjokes, pyautogui, pyQt etc.

2. Literature Survey:-

A speech synthesizer takes as input and produces an audio stream as output. A speech recognizer on the other hand does opposite. It takes an audio stream as input and thus turns it into text transcription. The voice is a signal of infinite information. A direct analysis and synthesizing the complex voice signal is due to too much information contained in the signal. Therefore the digital signal processes such as Feature Extraction and Feature Matching are introduced to represent the voice signal.

In this project we directly use speech engine which use Feature extraction technique .Our aim to create more and more functionalities which can help human to assist in their daily life and also reduces their efforts. Design of a compact large vocabulary speech recognition system that can run efficiently on any laptop devices, accurately and with low latency. Speech recognition has a long history with several waves of major innovations. Speech recognition for dictation, search, and voice commands has become a standard feature on laptop devices. Speech Recognition is main function of **"Voice Activated Intelligent Assistant Using ML"** it work on human voice.

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.

3. Problem statement:

a) Artificial Intelligent assistants leverage voice recognition and natural language processing (NLP). The voice recognition part converts the sound waves into to written words. The NLP part then those words and processes the commands the contain. The main task of a voice assistant is to minimize the use of input devices like keyboard, mouse, touch pens etc. using machine learning. An intelligent personal assistant can help someone with basic tasks. Voice assistants don't really "understand" what you're saying – they just listen for their wake word and then begin communicate with a server to a complete a task.

b) We already have multiple virtual assistants. But we hardly use it. There are number of people who have issues in voice recognition. These systems can understand English phrases but they fail to recognize in our accent. Our way of pronunciation is way distinct from theirs. Also, they are easy to use on mobile devices than desktop systems. There is need of a virtual assistant that can understand English in Indian accent and work on desktop system.

4. HARDWARE AND SOFTWARE REQUIREMENTS

The software is designed to be light-weighted so that it doesn't be a burden on the machine running it. This system is being build keeping in mind the generally available hardware and software compatibility.

Here are the minimum hardware and software requirement for virtual assistant.

Hardware:

- Pentium-pro processor or later.
- RAM 512MB or more.

Software:

- Windows 7(32-bit) or Linux –Ubuntu 20.04 above.
- Python 3.0 or later
- Python IDLE editor 3.6.4Visual Studio Code

5. System Design

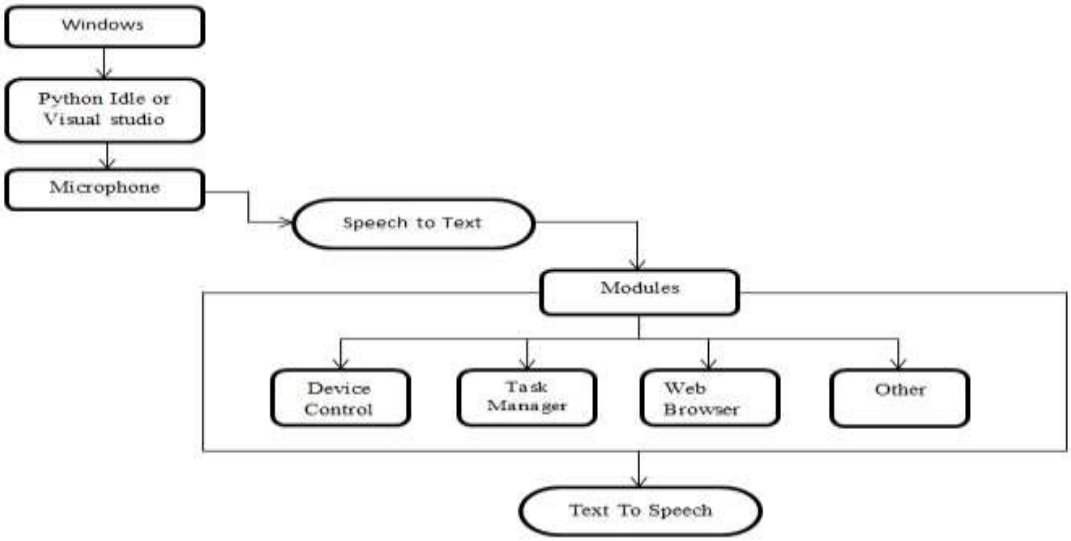

Fig 3.2.1 System design for Voice Activated Intelligent Assistant Using ML

5.1 Modules:

To build a personal voice assistant it's necessary to install the following packages in your system using the pip command.

1. **Divice Controller:**

These modules controlling the softwares divices on our pc

Shutdown: This command using shutdown our pc

Reboot: This command using Reboot our pc

File reading , writing , manipulating: This command using performing Files

Open applications: This command using open all Software applications on pc

e.g. . open folder, files etc.

2. Task Manager:

Conversion of Speech-to-Text and Text-to-Speech is performed by task manager

Creates a Calendar: This command uses create and opening calendars

Date & Time: This is an inbuilt module in python its work on display date and time

Alarm: This command using setting alarm on pc

Taking Note: This command using writing the something on notepad or

World documentation

3. Web browser:

This module allows the system to display web-based information to users. For example, the user wants to open any website and he gives input as "Open Google". The input is processed using the web browser module and the user gets a browser with google opened in it. The browser which will be used is the default set web browser.

Searching the internet

Sending and chocking mails

Checking weather updates

4. Others:

OS MODULE: This module is a standard library in python and it provides the function to interact with operating system

Pyjokes: Pyjokes is used for collection python jokes over the Internet. To install this module type the below command in the terminal

Twilio: Twilio is used for making call and message. To install this module type below command in the terminal.

SMTPLIB: Python has this module for in the standard library for working with emails & email servers. The SMTPLIB defines an object known as "SMTP client session object" which is used to send mails by the userThere are 3 steps involved - initialize, send mail (), quit.

5.2 Activity Diagram

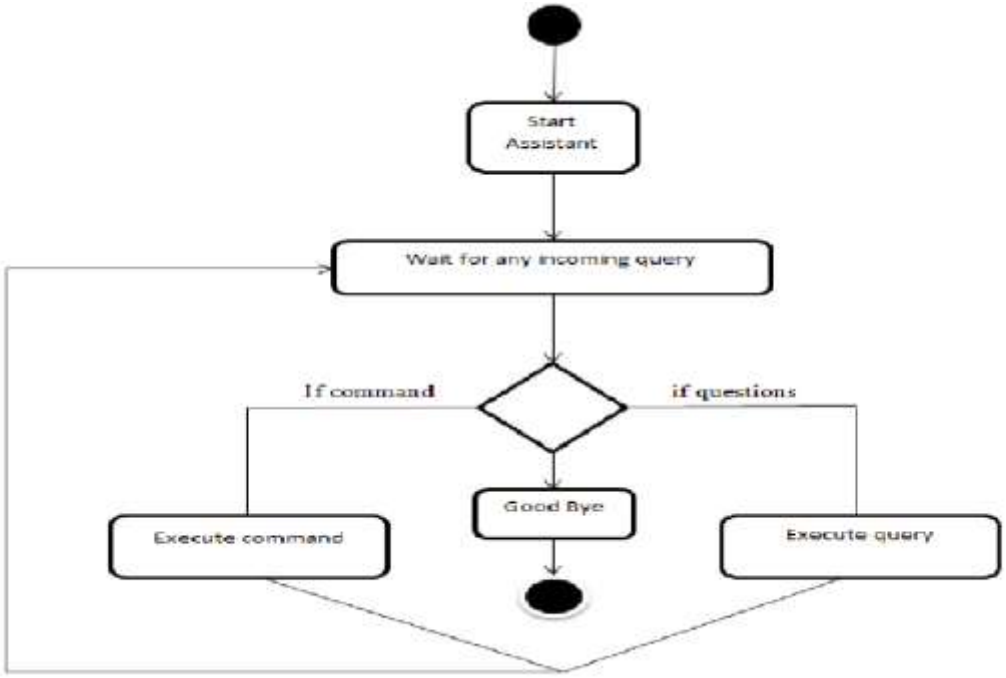

Fig 5.2.1 Activity diagram

5.3 Flowchart

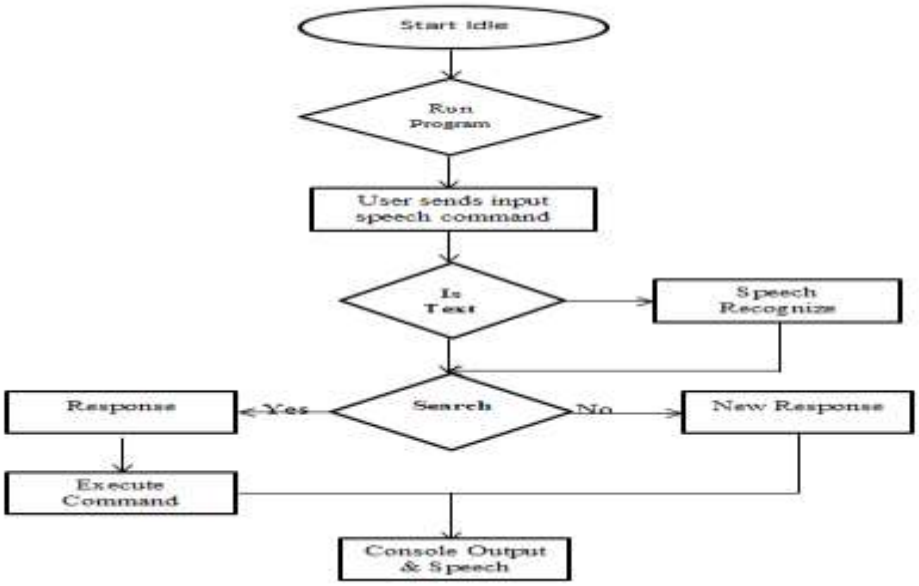

Fig 5.3.1 Flowchart

6 PROPOSED SYSTEM

It was an interesting task to make my own assistant. It became easier to send emails without typing any word, Searching on Google without opening the browser, and performing many other daily tasks like playing music, opening your favorite IDE with the help of a single voice command. Voice Activated Intelligent Assistant Using ML is different from other traditional voice assistants in terms that it is specific to desktop and user does not need to make account to use this, it does not require any internet connection while getting the instructions to perform any specific task.

The IDE used in this project is Visual Studio Code. All the python files were created in Visual Studio Code and all the necessary packages were easily installable in this IDE. For this project following modules and libraries were used i.e. pyttsx3, SpeechRecognition, Datetime, Wikipedia, Smtplib, pywhatkit, pyjokes, pyautogui, pyQt etc.

By making this project, I realized that the concept of AI in every field is decreasing human effort and saving time. Functionalities of this project include, It can send emails, It can Fetch IP Address, It can send text on WhatsApp, It can open command prompt, your favorite IDE, notepad etc., It can play music, It can do Wikipedia searches for you, It can open websites like Google, YouTube, etc., in a web browser, It can give weather forecast, It can give desktop reminders of your choice. It can have some basic conversation

7 CONCLUSIONS

Voice Activated Intelligent Assistant Using ML will use the Natural language processing and can be integrated with artificial intelligence techniques to achieve a smart assistant that can control the computer and applications and even solve user queries using web searches. It can be designed to minimize the human efforts to interactive with many other subsystems, which would otherwise have to be performed manually. By achieving this ,the system will make human life comfortable

8 ACKNOWLEDGEMENTS

This work is just not an individual contribution still its completion. I take this opportunity to thank all for bringing it close to the conclusion. A special thanks goes to my Guide **Prof. Miss. K. V. Rokade,** for leading me to many new insights, encouraging and teaching me how to get down to the root of the problem.

We are also grateful to **Prof. P. A. Chougule** and the department faculty and staff members for their support. We are also thankful to all friends and well wishers for support during the demanding period of this work. This document, in its eternity (as with everything I have or have yet to accomplish) is attributable to the Parents, whose strength and compassion are my constant inspiration.

I would also like to thank my wonderful colleagues and friends for listening my ideas, asking questions and providing feedback and suggestions for improving our ideas.

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