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Voice Assistance on Multi System Using Python

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A B S T R A C T

The project aims to develop a personal-assistant for Linux-based systems. Jarvis draws its inspiration from virtual assistants like Cortana for Windows, and Siri for iOS. It has been designed to provide a user-friendly interface for carrying out a variety of tasks by employing certain well-defined commands. Users can interact with the assistant either through voice commands or using keyboard input. As a personal assistant, Jarvis assists the end-user with day-to-day activities like general human conversation, searching queries in google, bing or yahoo, searching for videos, retrieving images, live weather conditions, word meanings, searching for medicine details, health recommendations based on symptoms and reminding the user about the scheduled events and tasks. The user statements/commands are analysed with the help of machine learning to give an optimal solution.

Keywords: Personal Assistant, Linux Systems, Automation, Machine Learning.

1. Introduction

The query for the assistant can be manipulated as per the user's need. Speech recognition is the process of converting audio into text. This is commonly used in voice assistants like Alexa, Siri, etc. Python provides an API called Speech Recognition to allow us to convert audio into text for further processing. In this article, we will look at converting large or long audio files into text using the Speech Recognition API in python. In today's era almost all tasks are digitalized. We have Smartphone in hands and it is nothing less than having world at your fingertips. These days we aren't even using fingers. We just speak of the task and it is done. There exist systems where we can say Text Dad, "I'll be late today." And the text is sent. That is the task of a Voice Assistant. It also supports specialized task such as booking a flight, or finding cheapest book online from various ecommerce sites and then providing an interface to book an order are helping automate search, discovery and online order operations. Voice Assistants are software programs that help you ease your day-to-day tasks, such as showing weather report, creating reminders, making shopping lists etc. They can take commands via text (online chat bots) or by voice. Voice based intelligent assistants need an invoking word or wake word to activate the listener, followed by the command. We have so many virtual assistants, such as Apple's Siri, Amazon's Alexa and Microsoft's Cortana. This system is designed to be used efficiently on desktops. Personal assistant software improves user productivity by managing routine tasks of the user and by providing information from online sources to the user. It is effortless to use. Voice searches have dominated over text search. Web searches conducted via mobile devices have only just overtaken those carried out using a computer and the analysts are already predicting that 50% of searches will be via voice by 2020.

1.1 Current Scenario

Voice assistance systems are rapidly becoming popular in multi-system environments. Python is one of the popular programming languages used to develop voice assistants due to its ease of use and availability of libraries for speech recognition and natural language processing. Development of Custom Voice Assistants: With the increasing demand for voice assistants in various domains, developers are creating custom voice assistants for specific use cases such as home automation, healthcare, and education. Integration with Multi-Systems: Voice assistants are being integrated with multiple systems, such as smart homes, healthcare systems, and transportation systems, to provide a seamless and personalized user experience. Natural Language Processing: Python's Natural Language Toolkit (NLTK) and other libraries are being used for natural language processing to enable the voice assistants to understand and respond to user queries in a more human-like manner.

1.2 Problem Domain

integration with legacy systems, multi-lingual support, contextual understanding, personalization, security and privacy, interoperability, and limited feedback channels are some of the key problem domains that need to be addressed in voice assistance on multi-systems using Python. Addressing these challenges will enable the development of more robust and user-friendly voice assistance systems. There already exist a number of desktop virtual assistants. A few examples of Current virtual assistants available in market are discussed in this section along with the tasks they can provide and their drawbacks.

2. Objective of Research

Currently, the project aims to provide the Linux Users with a Virtual Assistant that would not only aid in their daily routine tasks like searching the web, extracting weather data, vocabulary help and many others but also help in automation of various activities.

In the long run, we aim to develop a complete server assistant, by automating the entire server management process - deployment, backups, auto-scaling, logging, monitoring and make it smart enough to act as a replacement for a general server administrator.

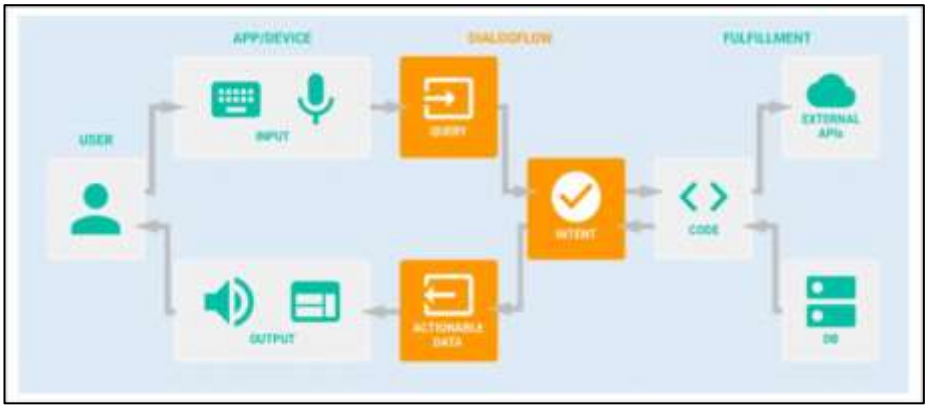

Fig. 1 – System Architecture of Voice Assistance on Multi System Using Python.

3. Survey of Technology

Speech Recognition Libraries: Libraries like Speech Recognition and Pocket Sphinx are used for speech recognition in voice assistance systems. These libraries enable developers to convert speech to text, which is then processed by natural language processing algorithms. Natural Language Processing Libraries: Libraries like Natural Language Toolkit (NLTK), spaCy, and Text Blob are used for natural language processing. These libraries enable developers to extract meaning from the text and generate responses. Python Web Frameworks: Web frameworks like Flask and Django are commonly used to develop web-based user interfaces for voice assistance systems. Cloud Services: Cloud services like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP) are used for hosting and deploying voice assistance systems. These services offer speech recognition and natural language processing APIs that can be used to develop voice assistants. Database Management Systems: Database management systems like MySQL and PostgreSQL are used for storing user data and system logs in voice assistance systems. Machine Learning Libraries: Machine learning libraries like scikit-learn and TensorFlow are used for developing models for speech recognition and natural language processing. In summary, speech recognition libraries, natural language processing libraries, Python web frameworks, cloud services, chatbot development platforms, voice assistant SDKs, audio processing libraries, database management systems, and machine learning libraries are some of the key technologies used in voice assistance on multi-systems using Python.

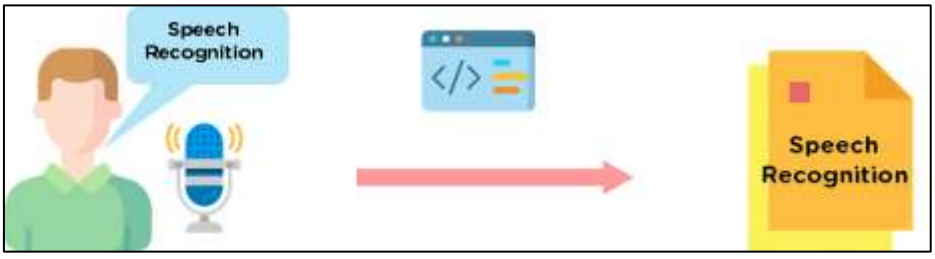

Fig. 2 - Project Elaboration.

4. Conclusion

Through this voice assistant, we have automated various services using a single line command. It eases most of the tasks of the user like searching the web, retrieving weather forecast details, vocabulary help and medical related queries. 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 future plans include integrating Jarvis with mobile using React Native to provide a synchronized experience between the two connected devices. Further, in the long run, Jarvis is planned to feature auto deployment supporting elastic beanstalk, backup files, and all operations which a general Server Administrator does. The functionality would be seamless enough to replace the Server Administrator with Jarvis. This paper presents a comprehensive overview of the design and development of a Voice enabled personal assistant for pc using Python programming language. This Voice enabled personal assistant, in today's life style will be more effective in case of saving time, compared

to that of previous days. This Personal Assistant has been designed with ease of use as the main feature. The Assistant works properly to perform some tasks given by user. Furthermore, there are many things that this assistant is capable of doing, like turning our PC off, or restarting it, or reciting some latest news, with just one voice command.

Acknowledgements

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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