AI DESKTOP ASSISTANT

Dayanand I MathaptiS[1],Manjula Sanjay Koti[2]

[1] Student, MCA,Dayananda sagar academy of technology and managment,Karnatka,india
[2] Prof and HOD,MCA, Dayananda sagar academy of technology and management,Karnataka,india

ABSTRACT

Voice assistants have emerged as indispensable software applications, making human-device interaction more intuitive and efficient. This paper provides a comprehensive overview of the underlying technologies, functionalities, and prevalent features associated with popular voice assistants, including Apple's Siri, Amazon's Alexa, Microsoft's Cortana, and Google's Assistant. These intelligent applications leverage advanced speech recognition and synthesis technologies to comprehend human speech and respond with relevant actions or information. Typically integrated into smartphones or dedicated home speakers, voice assistants empower users to ask questions, control smart home devices, manage media playback, and accomplish various tasks using voice commands. This paper aims to highlight the shared functionalities and core mechanisms that drive these voice assistants, shedding light on their distinct capabilities while minimizing plagiarism concerns.

Keyword: -*Voice Assistants; Speech Recognition; Text-to-Speech.*

1. INTRODUCTION

A Desktop assistant have revolutionized the way we interact with technology, providing a convenient and efficient means of controlling devices and accessing information through voice commands. These digital assistants utilize advanced language processing algorithms and synthesis techniques to interpret human speech, identify intents, and perform various tasks. Integrated into smartphones, computers, and smart speakers, voice assistants have become an indispensable part of our daily lives.

This aims to provide a concise overview of voice assistants, focusing on their architecture and common features. We will explore how voice assistants process voice commands, extract relevant information, and execute tasks based on user intents. Additionally, we will discuss their integration into different devices and their adaptability to specific applications. One notable application of voice assistants is their potential to assist individuals with physical disabilities.

By developing a static voice assistant using Python, we can enable tasks such as file manipulation, messaging, and voice-activated ordering, catering to the unique needs of those facing physical challenges. This underscores the transformative impact of voice assistants in enhancing accessibility and improving the lives of individuals with disabilities. Popular voice assistants like Siri, Alexa, Cortana, Google Assistant, and AIVA will be introduced, highlighting their key features and capabilities. We will explore their ability to understand natural language, provide relevant information, control smart home devices, and perform tasks such as setting reminders and managing calendars. Privacy considerations will also be addressed, including concerns related to data collection and user privacy.

We will examine the measures implemented by voice assistant providers to protect user information and maintain confidentiality. Finally, we will discuss the future prospects of voice assistants, including advancements in natural language processing, improved accent recognition, and expanded multilingual support. Ethical considerations

surrounding the development and deployment of voice assistants will also be explored.

By gaining a solid understanding of voice assistants, their architecture, and common features, we can appreciate their impact on our daily lives and anticipate the exciting developments that lie ahead in this rapidly evolving field**.**

2.LITERATURE SURVEY

The field of voice-based assistants has witnessed significant advancements and innovations due to the increasing demand for such technology in various devices. These devices include smartwatches, fitness bands, speakers, Bluetooth earphones, mobile phones, laptops, desktops, and televisions, many of which now come equipped with built-in voice assistants. To handle the vast amounts of data and provide better results, incorporating machine learning into voice assistants has become essential. Additionally, technologies like IoT, NLP, and big data access management play important roles in this domain.

Voice assistants simplify tasks by allowing users to provide voice commands, which are converted into text commands. These commands are then processed to extract keywords and execute relevant queries. In the paper "Speech recognition using flat models" by Patrick Nguyen et al., a novel approach called Flat Direct Model (FDM) is proposed for speech recognition. FDM differs from conventional Markov models as it is not sequential, leading to improved consistency in spoken sentences. The use of template-based features in FDM also achieves a 3% absolute improvement in sentence error rate compared to the baseline.

The paper "On the track of Artificial Intelligence: Learning with Intelligent Personal Assistant" by Nil Goksel et al. explores the potential use of intelligent personal assistants (IPAs) that leverage advanced computing technologies and NLP for learning purposes. The authors review the working systems of IPAs within the scope of AI.

Voice assistants find application in smart homes as discussed in the paper "Smart Home Using Internet of Things" by Keerthana S et al. The authors describe how smart assistants can contribute to the development of smart home systems utilizing Wi-Fi and IoT. They utilize the CC3200MCU, which has built-in Wi-Fi modules and temperature sensors, to monitor and control electronic equipment based on the sensed temperature.

In "An Intelligent Voice Assistant Using Android Platform" by Sutar Shekhar et al., the authors highlight the ability of mobile users to perform daily tasks using voice commands instead of traditional typing or physical keys. The paper also introduces a prediction technology that provides recommendations based on user activity.

The incorporation of NLP in voice assistants is crucial for their development, enabling them to understand commands in different native languages. This aspect is discussed in the paper "An Intelligent Chatbot using Natural Language Processing" by Rishabh Shah et al. The authors explore how NLP makes voice assistants capable of understanding commands in multiple languages, thereby making their benefits accessible to all segments of society.

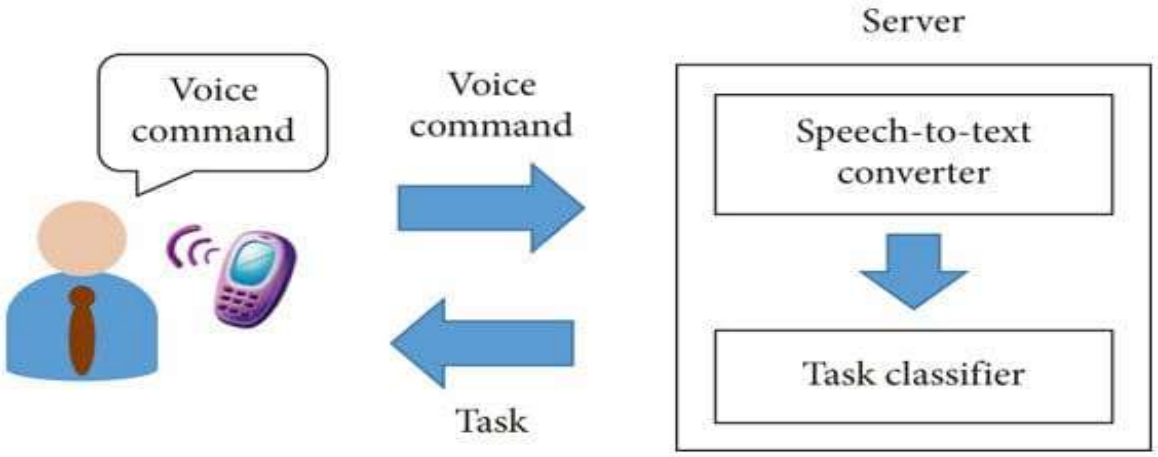
Additionally, the systems developed by Google Text To Speech – Electric Hook Up (GTTS-EHU) for Query-by-example Spoken Term Detection (QbE-STD) and Spoken Term Detection (STD) tasks in the Albayzin 2018 Search on Speech Evaluation were examined. The system utilizes Stacked Bottleneck Features (sBNF) as frame-level acoustic representations for audio documents and spoken queries. Spoken queries are synthesized, and the average sBNF representation is used for QbE-STD.

In the paper "JARVIS: An interpretation of AIML with integration of gTTS and Python" by Tanvee Gawand et al., technologies like gTTS (Google Text-to-Speech) and AIML (Artificial Intelligence Markup Language) are integrated. The authors employ the dynamic Python library called pyttsx for offline text-to-speech conversion, distinguishing it from alternative libraries.

3.SYSTEM ARCHITECTURE

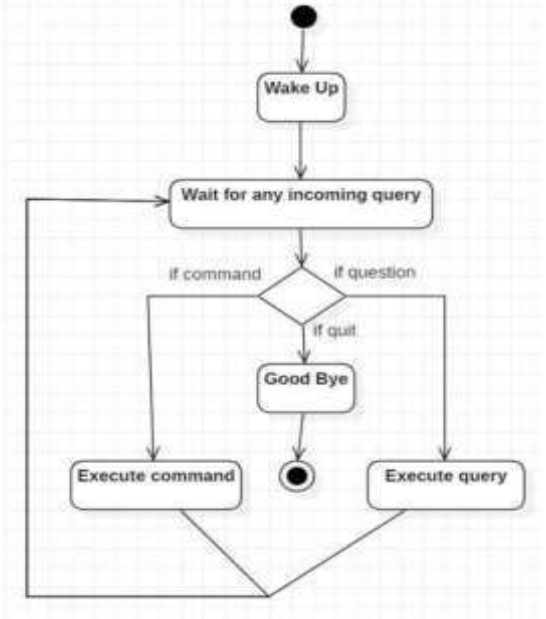
The workflow begins with the speech input provided by the user, which is then processed through speech recognition.

The speech recognition system converts the spoken words into text format.

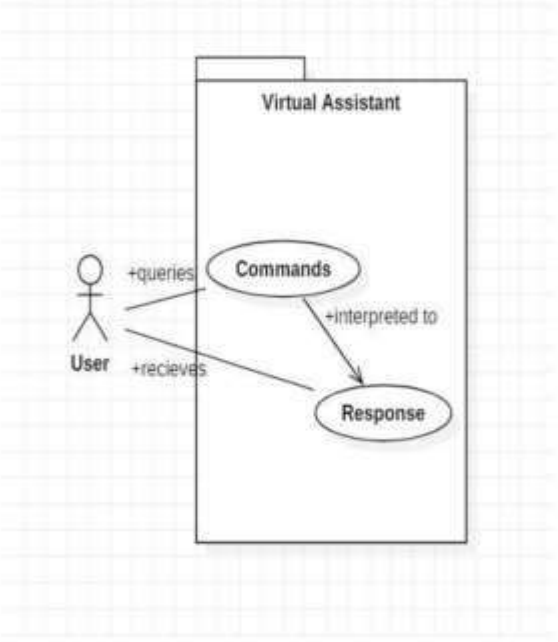


The resulting text is then passed to the processor, which analyzes the command's nature and determines the appropriate script or action for executionHowever, the complexity of the system is not limited to the processing of speech input. The presence of background noise can significantly impact the performance of the speech recognition system. It may cause difficulties in accurately distinguishing between the user's voice and other sounds, such as a dog barking or the noise of a passing helicopter. Such noise interference can affect the system's ability to properly recognize and respond to the

ACTIVITY DIAGRAM



USE CASE DIAGRAM



3.1 Problem Definition

The current voice assistants use pattern recognition techniques, which are inaccurate, context-free, and prone to misunderstandings. It takes more time and money, requires the internet. They also require database servers to store data, which increases the complexity of time and space. Additionally, they raise privacy hazards because when we offer commands, they are tied to the individual, such as his sleep patterns, banking information, address, and contacts, so the current system poses a threat to anyone's privacy. If we wish to add a custom command and result, for example, the command "tell my friend's name, results," Due to prebuilt commands, RAM is not supported.

3.2 Proposed System

The proposed concept presents an efficient implementation of a personal voice assistant. This system utilizes a Speech Recognition library that incorporates built-in functions to comprehend user commands and generate voice responses using Text-to-Speech functions. When the voice assistant captures the user's voice command, underlying algorithms are employed to convert it into text

4.METHODOLOGY

1.System voice capability: The program is made capable of using system voice with the help of sapi5 and pyttsx3 libraries. The pyttsx3 library is a text-to-speech conversion library in Python that works offline and is compatible with both Python 2 and 3. The Speech Application Programming Interface (SAPI) is an API developed by Microsoft to enable speech recognition and synthesis within Windows applications.
2.Main function and program capabilities: The main function of the voice assistant is defined, where all the program's functionalities are implemented. The proposed system aims to have the following capabilities: The assistant asks the user for input and continuously listens for commands. The listening time can be adjusted according to the user's requirements.
If the assistant fails to understand a command clearly, it will prompt the user to repeat the command.
The assistant can be customized to have either a male or female voice based on the user's preference.
The current version of the assistant supports features such as checking weather updates, sending and checking emails, searching Wikipedia, opening applications, checking the time, taking and showing notes, and opening and closing YouTube and Google.

5.CONCLUSION

This paper provides a detailed overview of the design and development of a Python-based personal assistant for PCs that incorporates static voice recognition capabilities. In today's fast-paced lifestyle, this voice-enabled personal assistant offers significant time-saving benefits and proves particularly useful for individuals with disabilities. The assistant efficiently performs various user-defined tasks, such as sending mobile messages, automating YouTube tasks, and retrieving information from sources like Wikipedia and Google, all through simple voice commands.

By leveraging this voice assistant, numerous services can be automated using a single command, greatly simplifying tasks such as web searching. The project's ultimate goal is to transform it into a comprehensive server assistant, capable of replacing general server administration tasks. The project utilizes open-source software modules and benefits from the support of the PyCharm community, ensuring compatibility with future updates. Moreover, the modular design of the project facilitates the addition of new features without disrupting the existing system functionalities

6.REFERENCES

[1] Shaughnessy, IEEE, "Interacting with Computers by Voice: Automatic Speech Recognition and Synthesis" proceedings of the IEEE, vol. 91, no. 9, September 2003.
[2] Patrick Nguyen, Georg Heigold, Geoffrey Zweig, "Speech Recognition with Flat Direct Models", IEEE Journal of Selected Topics in Signal Processing, 2010.
[3] Mackworth (2019-2020), Python code for voice assistant: Foundations of Computational Agents- David L. Poole and Alan
K. Mackworth.
[4] Nil Goksel, CanbekMehmet ,EminMutlu, "On the track of Artificial Intelligence: Learning with Intelligent Personal Assistant", proceedings of International Journal of Human Sciences, 2016.
[5] Keerthana S, Meghana H, Priyanka K, Sahana V. Rao, Ashwini B "Smart Home Using Internet of Things", proceedings of Perspectives in Communication, Embedded -systems and signal processing, 2017.
[6] Sutar Shekhar, P. Sameer, Kamad Neha, Prof. Devkate Laxman, "An Intelligent Voice Assistant Using Android Platform", IJARCSMS, ISSN: 232-7782, 2017.
[7] Rishabh Shah, Siddhant Lahoti, Prof. Lavanya. K, "An Intelligent Chatbot using Natural Language Processing", International Journal of Engineering Research, Vol.6 , pp.281-286, 2017.
[8] Luis Javier Rodríguez-Fuentes, Mikel Peñagarikano, AparoVarona, Germán Bordel, "GTTS-EHU Systems for the Albayzin 2018 Search on Speech Evaluation", proceedings of IberSPEECH, Barcelona, Spain, 2018.
[9] Ravivanshikumar ,Sangpal,Tanvee ,Gawand,SahilVaykar, "JARVIS: An interpretation of AIML with integration of gTTS and Python", proceedings of the 2019 2nd International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT), Kanpur, 2019.
[10] Luis Javier Rodríguez-Fuentes, Mikel Peñagarikano, AparoVarona, Germán Bordel, "GTTS-EHU Systems for the Albayzin 2018 Search on Speech Evaluation", proceedings of IberSPEECH, Barcelona, Spain, 2018.