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A REVIEW PAPER ON PERSONAL DESTOP VOICE ASSISTANT FOR BLIND AND DISABLE PEOPLE

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ABSTRACT

Integrating artificial intelligence (AI) in desktop voice assistants has revolutionized how we assistance to users seamless and intuitive manner. The voice assistant uses speech recognition modules which is useful for recognizing and understanding human input voice and on the basis of user input command it gives the required input queries or performs the given task like opening and closing different applications, can search and send messages on WhatsApp without using keyboard or mouse. The assistant incorporates features such as voice recognition, natural language processing, and integration with external APIs to enhance its functionality and user experience. The assistant differentiates itself from existing solutions by offering a highly customizable and extensible platformAs a personal assistant, Jarvis assists the end-user with day-to-day activities like general human conversation, searching queries in google, 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 optimalsolution, 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. Therefore, the digital signal processes such as Feature Extraction and Feature Matching are introduced to represent the voice signal.

Keywords: Integrating Artificial, Natural Language Processing.

I. INTRODUCTION

Almost all tasks are now digitalized in today's world. Voice searches have surpassed text searches. Web searches conducted via mobile devices have only recently surpassed those conducted via computer, and analysts predict that 50% of searches will be conducted via voice by 2024. Virtual assistants are turning out to be smarter than ever. Allow your intelligent assistant to handle your email. Detect intent, extract critical information, automate processes, and provide personalized responses. In recent years, several researchers have become interested in the recognition of human activities. The desktop's virtual assistant in Python is a software programme that assists you with day-to-day tasks such as showing the weather report, creating reminders, making shopping lists, and so on. They can respond to commands via text (as in online chat bots) or by voice Automatic Speech Recognition (ASR), also known as voice recognition, recognizes spoken words and phrases and converts them to computer readable formats. As a result, distinguishing spoken words from background noise in audio is an additional challenge.[1]

What is voice assistant and how it works. Many of us might have already known about this voice assistant and we use this in our day-to-day life. A voice assistant is a digital assistant that uses voice recognition, language processing algorithms, and voice synthesis to listen to specific voice commands and return relevant information or perform specific functions as requested by the user. A brief description is given about them in this chapter. Speech is an effective and natural way for people to interact with applications, complementing or even replacing the use of mice, keyboards, controllers, and gestures. It uses the google calendar Api by which you will stay updated by your current events also. [2]

These personal assistants can be easily configured to perform many of your regular tasks by simply giving voice commands. The Most famous application of iPhone is “SIRI” which 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 the Google that is “Google Voice Search” which is used for in Android PhonesThe system is being

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designed in such a way that all the services provided by the mobile devices are accessible by the end user on the user's voice commands.[3]

Problem Definition

The rapid advancement of technology has led to significant improvements in user interfaces and interaction methods. However, despite these advances, blind and motion-impaired users still face considerable challenges when interacting with graphical user interfaces (GUIs) and conventional input methods. These challenges are exacerbated by the limitations of existing voice assistants, which, while useful, often lack the robustness and natural interaction needed to fully support these users' needs.

1. **Accessibility Barriers**: Blind users rely on screen readers and voice commands to interact with devices, but many current systems are not fully optimized for seamless, comprehensive voice interaction. Motion-impaired users often face difficulties with physical input methods and may find existing voice assistants lacking in responsiveness or customization.
2. **Limited Offline Functionality**: Many voice assistants require a constant internet connection to function effectively. This reliance on internet connectivity can be a significant barrier for users in areas with unreliable or limited internet access, impeding their ability to use these assistants effectively.
3. **Inadequate Personalization**: Existing voice assistants often do not offer sufficient personalization to cater to the diverse needs of users with disabilities. The interactions are frequently generic, failing to adapt to individual preferences and requirements.
4. **Complex Interaction Models**: Current systems may involve complex interaction models that are not intuitive or user-friendly for people with disabilities. This can lead to frustration and reduced efficiency in performing tasks.

Objectives

- To make user friendly for blind and disable peoples.
- To enhance productivity of streamline workflow.
- To improve Accuracy and Reliability.
- To make ease for the users to automate the things by using own voice commands.

II. LITERATURE REVIEW

[1] Paper Name: Desktop's Virtual Assistant Using Python

Author(s): N Umapathi, G Karthick, N Venkateswaran, R Jayadevan, Dava Srinivas

Publication: ResearchGate

Explanation: This project involves creating a Python-based virtual assistant, similar to Siri or Google Assistant. It uses AI to recognize and respond to voice commands, performing tasks like answering questions, playing music, and providing information. The assistant relies on voice recognition and Natural Language Processing (NLP) to understand and interact with users, making everyday tasks easier and improving productivity. [1]

[2] Paper Name: Desktop Voice Assistant Using Artificial Intelligent

Author(s): C. D. Sawarkar, Miss. Akanksha, S. Tripathi

Publication: International Research Journal of Modernization in Engineering Technology and Science (IRJMETS)

Explanation: The paper focuses on integrating artificial intelligence (AI) into desktop voice assistants to revolutionize human-computer interaction, particularly through the creation of an advanced AI-powered voice assistant named Jarvis. Digital signal processing techniques like feature extraction and matching are used to handle the complexities of voice signals. [2]

[3] Paper Name: Automated Voice Assistant

Author(s): Shivani Sharma, Vishnu Kushwaha, Vishal Tyagi, and Bipin Kumar Rai

Publication: ResearchGate

Explanation: The Automatic Voice Assistant is designed to enhance interaction for blind and motion-impaired users by offering a more natural, hands-free interface. It allows users to communicate through voice commands

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and can function with or without internet access. The 5 system processes voice or text input and provides results as actions or information, improving accessibility and user experience. [3]

[4] Paper Name: Voice Assistant Desktop

Author(s): Karan Singh, Vaishnavi Pawar, Rahul Sharma, Vinay Kumar Singh

Publication: International Journal of Creative Research Thoughts (IJCRT)

Explanation: This project demonstrates the creation of a Python-based voice assistant for desktop environments, designed to be flexible and intuitive for natural language interactions. It employs text-to-speech synthesis, natural language processing (NLP), and speech recognition to accurately interpret user commands. [4]

[5] Paper Name: Desktop's Virtual Assistant Using Natural Language Processing

Author(s): Shubham Thor bole, Anuradha Pandit, Gayatri Raut, Tejas Sirsa

Publication: Journal of Emerging Technologies and Innovative Research

Explanation: Integrating artificial intelligence (AI) into desktop voice assistants has transformed how users interact with computers. Advanced AI-powered assistants like Jarvis AI can understand natural language commands, process information, and provide personalized assistance seamlessly. [5]

III. METHODOLOGY

1. Problem Understanding and Requirement Analysis:

• Define the objectives and scope of the voice assistant

• Identify target users and their needs (egg, tank automation, information retrieval Analyze existing voice assistant systems for insights and benchmarking

2. Technology Selection:

• Choose appropriate speech recognition and natural language processing (NLP) technologies based on project requirements and platform compatibility

• Consider using pre-built Al frameworks (e.g. TensorFlow, PyTorch) for model development and training.

3. Data Collection and Preparation:

• Gather relevant speech and text data for training speech recognition and NLP models Annotate and preprocess the data to prepare it for training (e.g. calming, normalization).

4. Speech Recognition:

• Develop or integrate a speech recognition system to convert spoken audio into test.

• Explore options such as deep learning-based models (e.g. CNNs, RNNs) or pre-trained APIs (e.g., Google Speech-to-Text, Mozilla Deep Speech).

5. Natural Language Understanding (NLU):

• Implement NLP techniques to extract intents and entities from user commands.

• Use tools like spacey or NLTK for tokenization, part-of-speech tagging, and named entity recognition (NER).

6. Intent Recognition and Dialog Management:

• Design an intent recognition system to identify user intents from parsed text

• Use techniques such as rule-based systems or machine learning classifiers (e.g. SVM, LSTM) for intent classification.

• Implement dialog management to maintain context and handle multi-turn conversations.

7. Task Execution and Integration:

• Integrate with external services and APIs to execute tasks based on user commands.

• Develop modules for various functionalities (e.g., opening applications, retrieving information) and handle error scenarios gracefully.

8. User Interface and Interaction Design:

• Design a user-friendly interface to support voice input and provide visual feedback.

• Implement audio feedback (e.g., synthesized speech) and on-corona interaction.

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9. Testing and Evaluation:

• Conduct thorough testing of the voice assistant across different sycamines and Ter.

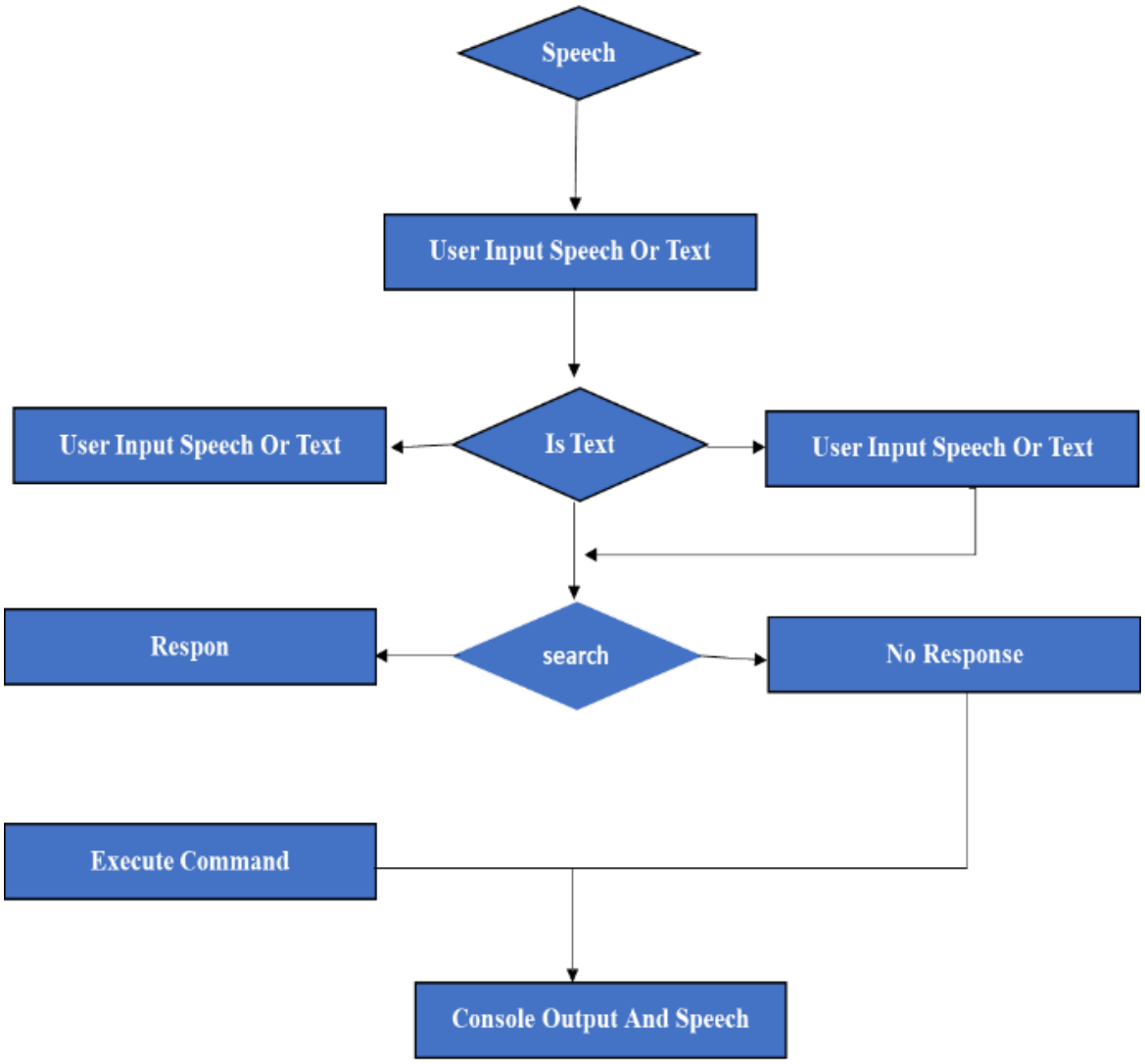
• Evaluate performance metrics such as accuracy, response time, and user ratification inputs. Gather user feedback for iterative improvements .

10. Deployment and Maintenance:

• Package the voice assistant into a desktop application compatible with target place (chg., Windows, macOS).

• Provide documentation and instructions for installation and usage Continuously update and maintain the system to improve functionality and a issues.

IV. DATA FLOW DIAGRAM



Advantages & Disadvantages

Advantages:

1. Hands-free Interaction:

• Users can interact with their desktops without using keyboards or mice, which can be particularly useful for multitasking or when hands are occupied.

2. Accessibility:

• Voice assistants provide an accessible interface for individuals with disabilities, making it easier to perform tasks through spoken commands.

3. Task Automation:

• Al-powered voice assistants can automate routine tasks like setting reminders, checking weather forecasts, or scheduling appointments, thereby improving efficiency.

4. **Natural Language Understanding**:

• Advanced Al algorithms enable natural language processing, allowing voice assistants to understand and respond to conversational queries more accurately.

5. **Increased Productivity**:

• Voice-based interactions can streamline workflows and enhance productivity by reducing the time needed to perform certain tasks.16 assistants may have limited functionality compared to their counterparts on mobile devices or smart speakers, due to differences in hardware capabilities or integration with specific platforms.

Disadvantages:

1. **Privacy Concerns**:

• Voice assistants often raise privacy concerns due to the collection and processing of voice data. Users may be apprehensive about the security of their personal information.

2. **Dependency on Internet Connection**:

• Many voice assistants require an internet connection to function properly, which can be a limitation in areas with poor connectivity or during network outages.

3. **Accuracy and Reliability**:

• Desktop Voice Assistant.

• Desktop Voice Assistant Using Artificial Intelligent Speech recognition and natural language processing technologies are not always 100% accurate, leading to misunderstandings or errors in command execution.

V. REFERENCE

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