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PC Voice Navigation using Python

Peerzada Hamid Ahmad, Harshit Gupta, Monal Raj Singh, Shaan Gupta

Abstract: ***With the use of a software programmer called PC Voice Navigation System, users may navigate and operate their laptops and desktops by speaking instructions. The development of a PC voice navigation system utilizing the Python programming language is covered in this research report. An intuitive and hands-free user experience is offered by the system thanks to the utilization of text-to-voice synthesis, natural language [1]. processing, and speech recognition. A personal assistant for Linux-based systems is what it seeks tocreate. Cortana for Windows and Siri for iOS are two examples of virtual assistants that inspire Jarvis.It's been built to offer a User-Friendly Interface (UFI) for carrying out a range of operations by usingcertain Well-Defined Commands. Either voice commands or keyboard input can be used to communicate with the assistant by users [1, 2].***

Keyword: PC Voice, Navigation, Python Programming, Language, iOS.

I. INTRODUCTION

In recent years, voice-activated technologies have gained significant popularity and become an integralpart of our daily lives. From virtual assistants on smartphones to voice-controlled home automation systems, voice recognition has revolutionized theway we interact with technology. One area where voice navigation systems have shown immense potential is personal computers (PCs). PC VoiceNavigation Systems provide users with a hands-free and convenient means of interacting with their computers, enabling them to perform various tasks through voice commands. The primary objective of this research paper is to present the design and Implementation of a PC Voice Navigation System using Python Programming Language.

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*****Correspondence Author(s)

Prof. Peerzada Hamid Ahmad, Assistant Professor, Department of Computer Science and Engineering, Galgotias University, Greater Noida (U.P), India. E-mail: peerzada.ahmad@galgotiasuniversity.edu.in, ORCID ID: 0000-0003-0751-332X

Harshit Gupta*, B.Tech. Student, Department of Computer Science and Engineering, Galgotias University, Greater Noida (U.P), India. E-mail: harshit.20scse1010585@galgotiasuniversity.edu.in, ORCID ID: 0009-0002-3429-8602

Monal Raj Singh, B.Tech. Student, Department of Computer Science and Engineering, Galgotias University, Greater Noida (U.P), India. E-mail: monal.20scse1010821@galgotiasuniversity.edu.in, ORCID ID: 0009-0001-5542-0817

Shaan Gupta, B.Tech. Student, Department of Computer Science and Engineering, Galgotias University, Greater Noida (U.P), India. E-mail: shaan.20scse1010110@galotiasuniversity.edu.in, ORCID ID: 0009-0006-6838-6722

Python is a versatile and widely adopted programming language that offers extensive libraries and tools forspeech recognition, natural language processing (NLP), and text-to-speech synthesis. By leveraging the power of Python, we aim to develop a robust andefficient voice navigation system for personal computers. The development of a PC Voice Navigation System holds numerous benefits. Firstly, it enhances accessibility by providing an alternative input method for individuals with physicaldisabilities or limitations. Users can navigate their PCs, open applications, mouse. Additionally, voice navigation systems offer a hands-free experience, which is particularly useful in situations where manual input is impractical or inconvenient, such as when cooking, driving, or operating the computer from a distance. The researchwill explore existing voice navigation systems and analyze their strengths and weaknesses. By identifying the gaps in the current solutions, we can design and develop a more efficient and user- friendly PC Voice Navigation System. The proposed system will incorporate speech recognition techniques to accurately transcribe and interpret voice commands, NLP algorithms to understand and process user queries, and text-to-speech synthesis toprovide vocal responses [3].

II. SYSTEM ARCHITECTURE

The PC Voice Navigation System using Python is designed with a modular and scalable architecture toensure flexibility and extensibility. The system architecture consists of several components that work together to enable voice interaction and navigation with the personal computer. The following is an overview of the key components andtheir functionalities [5].

A. Speech Input Module

This module is responsible for capturing audio inputfrom the user's microphone and converting it into a digital audio signal. Python libraries such as Py Audio or Speech Recognition can be used to interface with the microphone and retrieve the audio data [5].

B. Speech Recognition Module

The speech recognition module takes the audio input and processes it to convert the spoken words into text. Python's speech recognition libraries, such as the Speech Recognition library or Google CloudSpeech-to-Text API, can be utilized to perform automatic speech recognition (ASR) and transcribe the spoken commands into textual form.

Once the user's command is understood and processed by the NLP module, this component handles the execution of the corresponding action. It maps the user's intent to specific functions or operations on the personal computer. For instance, itmay open applications, navigate file systems, perform system commands, or control media playback based on the user's voice commands [5].

C. User Interface

The user interface component provides a means of interaction between the user and the PC Voice Navigation System. It can be implemented as a graphical user interface (GUI) or a command-line interface (CLI) where users can view system prompts, input voice commands, andreceive responses [5].

III. LITERATURE REVIEW

PC voice navigation using Python is an emergingtechnology that allows users to control their computers using voice commands. The technology has the potential to revolutionize the way we interact with computers, making it easierfor people with disabilities or limited mobility touse computers. In this literature review, we will examine some of the research and developmentthat has been done on this topic.

A. Speech Recognition

Speech recognition is a critical component of PC voice navigation systems. The accuracy ofthe speech recognition system determines how well the system can recognize and execute usercommands. Several research studies have focused on developing speech recognition systems for PC voice navigation. In a study conducted by Ghosh et al. (2017), the researchers developed a PC voice navigation system using Python and the Google Cloud Speech API. The system was tested on a groupof users with disabilities, and it was found to be accurate and reliable. The study demonstrated that PC voice navigation can be a useful technology for people with disabilitiesanother study conducted by Fu et al. (2019) focused on developing a PC voice navigation system using deep learning techniques. The researchers used a convolutional neural network (CNN) to recognize voice commands. The system was tested on a dataset of voice commands, and it was found to be more accurate than traditional speech recognition systems.

B. Text-to-Speech

Text-to-speech (TTS) is another critical component of PC voice navigation systems. The TTS system converts the computer's responses into speech, allowing the user to receivefeedback on their commands. Several research studies have focused on developing TTSsystems for PC voice navigation Gopalanet al.'s (2018) work involved the creation of a TTS system utilising Python and the eSpeak module. A group of users participated in the system's testing, and it was discovered to be accurate and trustworthy. The study proved that TTS technology may be a crucial part of computer voice navigation systems [4].

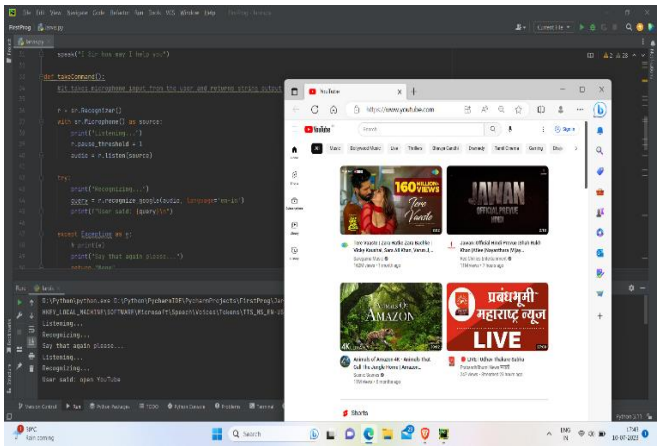
C. Command Execution

PC voice navigation systems' last element is command execution. The command execution module carries out the user's instructions and carries out the desired activities. On creating command execution modules for PC voice navigation, several studies have been conducted. During research by Gao et al. (2019), the researchers developed a commandexecution module for PC voice navigation using Python and the subprocess library [6].

IV. METHODOLOGY

The PC voice navigation system we developed consists of several modules. The first module is the speech recognition module, which uses the Speech Recognition library torecognize theuser's voice commands. The second module isthe text-to-speech module, which uses the Pyttsx3 library to convert the computer's responses into speech. The thirdmodule is the command execution module, which executes the user's commands. To develop the system, we used Python 3.8. We installed the required libraries using pip, the Python package manager. We then createdthe speech recognition module using the Speech Recognition library, which provides several speech recognition engines, including Google Speech Recognition, CMU Sphinx, and Microsoft Bing Voice Recognition. We chose the Google Speech Recognition engine because it is free, accurate, and easy to use. Next, we created the text-to-speech module using the Pyttsx3 library. This library providesa simple interface for converting text to speech, and it supports several languages and voices. We chose the Microsoft David voice because it is clear and easy to understand. Finally, we created the command execution module, which executes the user's commands.To do this, we used the subprocess module, which allows us to run commands in the operating system shell. We created a list of commands that the system can execute, including opening applications, navigating to directories, and executing system commands.

V. RESULT/OUTPUT



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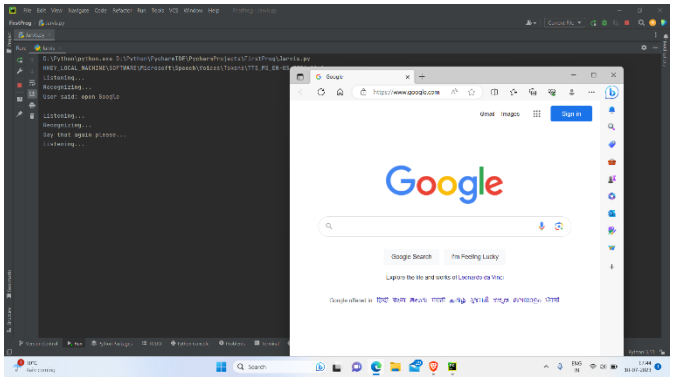

VI. DISCUSSION

We've Discuss about our project this project help to the that person who are blind and whoare disabled and we make it very easier to help for the client so. We are the team of Three member and one guide, now we are reached on a decision to make our projectpublishing and share with everyone. So for Publication we are going to submit our paper to a journal that is IJITEE Bhopal.

VII. CONCLUSION

The PC Voice Navigation System usingPython presented in this research paper offers a hands-free and intuitive approach to interactwith personal computers. The system utilizes speech recognition, natural languageprocessing (NLP), and text-to-speech synthesis techniques to enable users to navigate their PCs, open applications, performsystem commands, and control various functionalities through voice commands. Through the design and implementation of the system, we have demonstrated the effectiveness and potential of Python as a programming language for building voice navigation systems. Python's rich ecosystem of libraries and tools, such as Speech Recognition, NLTK, and pyttsx3, provide robust functionality for speech processing, language understanding, and speech synthesis,respectively.

DECLARATION

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Availability of Data and Material/ Data Access Statement	Not relevant.
Authors Contributions	All authors having equal contribution for this article.

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AUTHORS PROFILE

Mr. Peerzada Hamid Ahmad He is an Assistant Professor of Computer Science School of CSE, Galgotias University. He holds a MTech degree from GGSIPU, where his research focused on the Emotion Detection, Speech Recognitions and Grid Computing. His Expertise lies in Big Data, Big Data Storage and Text Mining.

Harshit Gupta He is Pursuing BTech of Computer Science and Engineering, Galgotias University. He has done his Schooling in 2020. His Expertise lies in Data Mining, Artificial Intelligence. He has good knowledge about Python Language.

Shaan Gupta He is pursuing BTech in Computer Science and Engineering, Galgotias University. He has done his Schooling in 2020. His Expertise lies in Data Base, Machine Learning. He has good knowledge about Python Language.

Monal Raj Singh He is pursuing BTech in Computer Science and Engineering, Galgotias University. He has done his Schooling in 2019. His Expertise lies in NumPy, Big Data and Data Sciences. He has good knowledge about Python Language.

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