VIRTUAL ASSISTANT USING PYTHON

Shivansh Singh
Student(UG) Department of Computer
Engineering
Galgotias University
Greater Noida, India
cvanshsingh03@gmail.com

Dr. Ajay Shankar
Professor(UG)
Department of Computer Engineering
Galgotias University
Greater Noida, India
ajay.shankar@galgotiasuniversity.edu.in

Saransha
Student(UG) Department of Computer
Engineering
Galgotias University
Greater Noida, India
saranshmisra2938@gmail.com

ABSTRACT

The rate of technical innovation is accelerating in the modern world. With the widespread usage of voice assistants like Google Assistant and Siri, we can now use our voice to create reminders, make notes, conduct computations, and look for information. The day when computers could only do a few simple tasks is long past. Computers are now capable of carrying out a variety of activities because to breakthroughs in machine learning, artificial intelligence, deep learning, and other cutting-edge technologies. In fact, utilising numerous input devices to try to connect with a computer nowadays appears archaic and ineffective.

We created a Python-based voice assistant that enables users to provide voice commands to any Linux command, doing away with the requirement for input devices like keyboards and mouse. The voice assistant not only lessens the need for input devices, but it also helps save hardware space and money overall. Users may efficiently access and manage their Linux systems with simplicity and convenience by utilising this technology.

INTODUCTION

Many of the duties that were formerly done by people are being replaced by machines in this period of fast technological advancement. Artificial intelligence and machine learning developments, which enable robots to understand and behave like people, are primarily responsible for this transition. The idea of virtual assistants—digital assistants that can hear voice commands and utilise language processing algorithms to carry out activities as instructed by the user—was sparked as a result. These helpers can remove background noise and offer pertinent information in response to the user's queries. Virtual assistants are totally software-based, yet despite this, they are becoming a commonplace feature of many products and technologies in modern culture.

Some assistants, like Alexa, are created to function especially with particular gadgets. It is crucial to train our robots utilising cutting-edge methods like machine learning, deep learning, and neural networks as technology advances at an accelerated rate. We can now have natural language conversations with our gadgets thanks to voice assistant technologies. The usage of voice assistants by many large businesses nowadays enables clients to communicate verbally with machines. For anyone who might have trouble using conventional input techniques, such as the elderly, physically challenged people, those who are visually impaired, youngsters, and others, these virtual assistants are very useful. Voice assistants allow even blind people to communicate with technology, bringing them a world of opportunities that weren't previously available to them.

LITRATURE REVIEW

There are several different virtual assistants that use artificial intelligence on the market today. Virtual Personal Assistants (VPAs) are tools that various businesses have created for particular apps and industries. For instance, Speak is optimised for Linux whereas Cortana from Microsoft is made for Windows. Popular possibilities for their respective operating systems, iOS and Android, include Apple's Siri and Google Assistant. To aid users with activities like appointment booking, question answering, and basic duties, these virtual assistants employ artificial intelligence and natural language processing. More cutting-edge virtual assistants are likely to hit the market as artificial intelligence continues to advance.

Siri was the first virtual assistant to be made accessible on an Apple device when it was unveiled in 2011 as an iPhone feature. In the beginning, it could send messages, make calls, monitor the weather, and set alarms. Siri's capabilities have grown over time to include web searches, driving directions, and restaurant recommendations. The Bing search engine is used by Microsoft's Cortana virtual assistant, which was released in 2014 and can make appointments and respond to customer enquiries. Google Assistant made its debut in 2016, integrating easily with mobile phones and other

smart home gadgets. Voice commands on Google's smart speaker or conversation on the Google Messaging app can be used to invoke Google Assistant. We may anticipate the industry to see ever more advanced and feature-rich options as virtual assistant technology continues to advance.

Cortana, a personal virtual assistant from Microsoft, was created for a variety of operating systems, including Windows, iOS, and Android. On the Windows operating system, Cortana is only supported by Windows 10. The virtual assistant may be accessible by an icon on the taskbar next to the search bar. It was originally made available for Windows 10 in 2015. Users may set up Cortana on their laptops or desktop computers, but the setup procedure can take some time. However, using Cortana for searches is rather simple once it is set up. Despite being beneficial, Cortana can only be used by Windows 10 users, which severely restricts its user base.

Microsoft's personal virtual assistant is now inaccessible due to the lack of support for Cortana in Internet Explorer, Windows 7, 8, and other versions. However, attempts are being made to create a virtual assistant that can be accessible from any Windows explorer and works with all Windows versions. Python is being used as the programming language for creating this virtual assistant, and PyCharm is being used as the platform for executing the virtual assistant code.

Our team is focused on developing online personal virtual assistant programmes that are simple to set up on laptops and desktop computers and provide customers a wide range of features including showing the time and date, managing emails, playing media files, opening programmes, and more. Users may programme our virtual assistant application to carry out particular tasks depending on their own needs and preferences.

PROBLEM FORMULATION

The goal is to develop a virtual assistant that can carry out a range of duties precisely and effectively. The difficulty is in fusing several approaches and algorithms to develop a virtual assistant that can comprehend spoken language and react properly. In order to do this, it is necessary to decide which essential capabilities—such as speech recognition, natural language comprehension, and dialogue management—the virtual assistant must have. The virtual assistant's efficacy also heavily depends on the quantity and calibre of data utilised to train the machine learning algorithms that drive it. Finding a means to combine diverse approaches and

algorithms while guaranteeing that the virtual assistant is trained on high-quality data to provide the required results is therefore a difficulty.

EXISTING SYSTEM

It's important to remember that there are voice assistants other than Cortana that are compatible with Windows OS, including Amazon's Alexa app for Windows and a number of third-party voice assistant programmes. These could differ from Cortana in terms of functionality and specifications, and they might not be online-based or browser-reliant.

Convolutional networks are the foundation of the majority of modern voice recognition methods. Even yet, they are not intended for use in real-world situations and are not appropriate despite their excellent accuracy.They employ the following basic techniques:

1 Context-aware computing: Software that can recognise its physical location and modify its behaviour is known as context-aware computing. It is also possible to distinguish between terms used by speakers with various accents or speech patterns using this technique. Furthermore, it can identify words that could have been mispronounced and offer the appropriate spelling.

2 Mel Frequency Cepstral Coefficients are referred to as MFCC. These coefficients provide an appropriate representation of the sound's frequency spectrum for speech recognition. The frequency spectrum is transformed into a perceptually meaningful scale using the Mel scale. MFCCs may be used to discern between various sounds and phonemes by capturing key aspects of speech, such as the energy distribution across frequency bands.

3 NLP: Artificial intelligence has an area called "natural language programming" that studies how human language and machines interact. Its fundamental objective is to develop software that can process massive volumes of data naturally. With the use of this technology, computers may acquire and grasp a sizable vocabulary in a particular language, enabling them to identify and comprehend spoken words.

SYSTEM ARCHITECTURE

Fig 1. Modules Imported

A. pyttsx3

A text-to-speech conversion tool named pyttsx3 is a platform-independent library. This library's ability to be utilised offline is a bonus. It's crucial to keep in mind that Pyttsx3 only supports Python 2, which may restrict certain users' use of it.

B. datetime

The datetime module in Python mixes dates and times. It has characteristics in common with the date and time classes. The year, month, day, hour, minute, second, microsecond, and tzinfo properties are all included in the datetime class.

C. speech recognition

For a variety of applications, including home automation and artificial intelligence, access to dependable voice recognition technology is crucial, especially when working with microcontrollers like Raspberry Pis that make use of external microphones. This article intends to give an overview of the Python Speech Recognition module and show how to use it as a key component in achieving this goal.

D. pyaudio

Through Python bindings, developers may use the cross-platform audio I/O tool PortAudio v19 thanks to the PyAudio Python library. Python can now record and play audio on a variety of operating systems, including GNU/Linux, Windows, and Apple macOS.

E. web browser

The "web browser" module of the Python programming language is a useful web browser controller. The presentation of web-based material is possible because to its sophisticated interface. Typically, all it takes to get the desired outcome is to invoke the web browser module's "open()" function.

F. OS

Python's OS module has a number of methods that help users make and remove directories, retrieve their contents, switch directories, find out what directory they are currently in, and do other related operations. You must import the OS module into your Python programme in order to use these capabilities.

G. smptlib

Users can send emails to any Internet-connected device equipped with an SMTP or ESMTP listening daemon using the Python package smtplib. The SMTP_SSL() technique, which is shorter than the starttls() option, is frequently chosen for establishing a secure connection.

CONCLUSION

A straightforward one-line command can automate a number of services using our voice assistant. It can make it easier to do things like browse the internet, provide weather predictions, help with vocabulary, and even respond to medical-related inquiries. We want to develop this project into a complete server assistant that can take the position of ongoing server maintenance. In order to deliver a synchronised experience across the two connected devices, we want to integrate Jarvis with mobile devices utilising React Native in the future. The assistant will also allow elastic beanstalk auto deployment, backup files, and other common Server Administrator tasks. Our goal is to develop a highly intelligent server helper that can minimise human effort by only requiring spoken commands to operate.

ACKNOWLEDGMENT

assignment. In writing this article, we would also like to extend our sincere gratitude to all those who have directly and indirectly guided us.

We thank all the individuals for their direct and indirect assistance in completing our assignment.

REFERENCE

A. www.stackoverflow.com
B. www.pythonprogramming.net
C. www.codeacademy.com
D. www.google.co.in
E. www.tutorialspoint.com
F. A. M. R. Correia and A. Mesquita (2006). New public challenges in higher education are posed by the society of knowledge. Lisbon, Edicoes S 'labo. OCLC: 494458369.
G. E. Currie, P. H. Harvey, P. Daryanani, J. C. Augusto, R. Arif, and A. Ali (2016). An examination of the effectiveness of avatar-based systems for student assistance. Transactions on e-Learning with EAI Endorsement, 3(11):151450.
H. Hanus, M. D., and J. (2015). A longitudinal study of the impact of gamification in the classroom on intrinsic motivation, social comparison, satisfaction, effort, and academic success. 80:152-161 in Computers & Education.