



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

KIVA: A Virtual Assistant

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Abstract: -

This project uses voice input and output to show text on the screen. Our voice assistance's major goal is to make people smarter by providing immediate and calculated outcomes. The voice assistant receives vocal input through our microphone (both Bluetooth and connected) and turns it into computer-understandable English, providing the user with the appropriate solutions and replies. This assistant uses the internet to retrieve results that the user has questioned. The Natural Language Processing algorithm enables computer machines to communicate in a variety of ways using natural human language.

Keywords: - Virtual Assistant Using Python, Artificial Intelligence, Digital assistance, Python Backends, API Calls, Speech Recognition Modules

Introduction: -

Artificial intelligence (AI) systems that can organise a genuine human-machine connection (through voice, communication, gestures, facial expressions, and other means) are becoming increasingly common. The direction of interaction, based on the machine's interpretation of real human language, was one of the most explored and popular. It is no longer a human who learns to speak with a machine; instead, it is a machine that learns to interact with a human by studying his actions, habits, and behaviour in

order to become his personalised assistant. Virtual assistants are software tools that assist you with daily duties such as weather forecasting, preparing reminders, and creating shopping lists. They can accept text (online chatbots) or voice commands. To activate the listener, voice-based intelligent assistants require an invoking phrase or wake word, followed by the order. Apple's Siri, Amazon's Alexa, and Microsoft's Cortana are just a few of the virtual assistants available.

This system is intended for usage on desktop computers. Personal assistant software increases user productivity by handling the user's everyday duties and giving information from an internet source. Virtual Personal Assistants have practically become a must in all technological devices in order to solve problems quickly.

This project was founded on the assumption that there is enough freely available data and information on the internet to develop a virtual assistant capable of making intelligent decisions for ordinary user tasks.

Problem Identification: -

In most cases, a user must manually manage many sets of programmed to execute a single operation. A user planning a trip, for example, should look up airport codes for nearby airports and then look for tickets between combinations of airports to go to their destination. A system that can effortlessly handle chores is required. We already have several virtual assistants on staff. However, we

seldom utilize it. A large proportion of people struggle with speech recognition. These algorithms can understand English sentences, but they are unable to distinguish our accent. Our pronunciation differs significantly from theirs. They are also more user-friendly on mobile devices than desktop systems. A virtual assistant who can interpret English with an Indian accent and work on a desktop system is required.

When a virtual assistant is unable to effectively answer inquiries, it is due to a lack of context or an understanding of the question's purpose. It can only answer relevant queries through thorough optimization using both humans and machine

Related Work:

The Authors [1] developed a sophisticated virtual agent that communicates with users in natural speech. The artificial intelligence-based core responsible for interpreting the Romanian language was designed and implemented. The system may be utilised by a wide range of stakeholders with minimum adjustments due to the flexibility of the implementation.

The virtual assistant [2] is an ever-changing technology. It means that the computer can recognise a user's voice command and provide the most appropriate and satisfactory response. User-based information is the emphasis of this virtual assistant. It will analyse the possible utility of one specific piece of software as a Virtual Assistant.

Virtual assistants and chatbots [3] can replace forms with interaction without adding to the load on institutions. However, solutions must be developed in collaboration with impaired students to ensure that their needs are satisfied, their concerns are addressed, and the final solution is fair to them. It discusses the methodology and design process, as well as findings from various phases of the study and recurring themes that emerged during the research.

In the author's work [4] an industrial database was constructed, a wireless sensor network was set up for data collection using the ZigBee protocol, data was collected fast and inexpensively in the database, and a natural language processing-based Virtual Assistant was created to query the data. The XMPP messaging protocol is used to communicate between the built Sensor Network, database, and Virtual Assistant.

learning. Maintaining strong quality control measures will also help reduce the possibility of the virtual assistant picking up unwanted undesirable habits. For them to function well, they must be given a tremendous volume of data. Virtual assistants should be able to model complicated task relationships and utilize these models to suggest user-friendly plans. When a task comprises several sub-tasks, each of which can have its own sub-tasks, it must be checked for optimal pathways. There may be various route options in this instance, and it should be able to account user preferences, other ongoing activities, and priorities when recommending a plan.

A Virtual Dialogue Assistant [5] is an automation technology designed to assist in the administration of exams and assessments on remote education platforms. During the COVID-19 epidemic, Online Distance Learning (ODL) has proved to be a crucial aspect of education systems throughout the world. While the essential components of ODL have been thoroughly explored and developed.

In The paper [6] the user must input their health-related enquiry, and the assistant will respond appropriately. Report generating and schedule assignment are among the features available. It will improve human-machine interaction through the use of many technologies, a large dialogue, conversational knowledge, and general knowledge.

In The paper [7] effective privacy protection is one of the most important virtues to cultivate. Personalization is a process that alters a system's operation, interface, information content, or uniqueness in order to make it more personal to an individual. Personalization comes in a variety of forms. Web personalisation is one of the most prevalent types.

The work [8] allows different voice-controlled virtual assistants to respond to hand gestures and generate written outputs as well. Deep Learning, Convolutional Neural Networks, Tensor Flow, and Python Audio Modules are among the concepts used. A camera captures the hand motions, which are subsequently interpreted by a Convolutional Neural Network, which generates reasonable languages.

The paper [9] propose formalising virtual assistant capacity using a Virtual Assistant Programming Language (VAPL) and translating natural language into VAPL code using a neural semantic parser. For verifying the neural model, Genie simply requires a limited amount of realistic input texts

The aim of the study [10] is to have the virtual assistant respond to user requests that are made through thought. The user thinks about the job, and the personal assistant processes it without the user providing any written or auditory input. The

user's ideas are transmitted to the virtual assistant through a brain computer interface (BCI) using equipment such as an electroencephalogram.

In the paper [11] the authors investigate the impact of various word embeddings trained with general and particular corpora in a Spanish pharmaceutical domain using Joint Natural Language Understanding. To train the model, we generate data using templates. The model is used to identify intent and fill slots. We compare word embeddings word2vec and fast Text, as well as language models ELMo and BER

Literature Survey: -

Authors	Publication Year	Methodology	Technology Used
Duguleană, M et al. [1]	2020	The paper describes the creation of an intelligent conversational agent that was designed to improve information accessibility in a history museum.	Artificial Intelligence, 3D Applications, Image Processing
K. Chauhan [2]	2020	The paper focuses on how virtual environments and virtual assistant interfaces work, and it shows virtual assistant programmes that aid in software access	Automation, Speech Recognition, Machine Learning, Face Recognition,
Lister, K et al. [3]	2021	The research revealed an issue of administrative load for disabled students and a virtual assistant was built as a solution utilizing participatory design.	Artificial Intelligence, Administrative Burden Disability, Accessibility
Çınaklı, M. et al. [4]	2021	In the paper, an industrial database was constructed, a wireless sensor network was set it up for data collection using the ZigBee protocol, data was collected fast and inexpensively in the database.	Natural Language Processing, Database Management, ZigBee, XMPP server,
Matveev, A et al. [5]	2021	In the paper, we provide an outline of VDA, which is designed to be integrated with online education platforms to improve the process of student performance evaluation.	Natural Language Processing, Machine Learning, Online Distance Learning.
til, S., Patil, V et al. [6]	2019	In the paper, the user must type their health-related enquiry, and the assistant will respond appropriately. The facilities like report generation as well as scheduling assignment are provided.	Artificial Intelligence, Data Science Algorithms, Machine Learning, Data Mining

Krausová, A [7]	2018	The paper proposes VILEM, an artificial intelligence-based virtual assistant whose major goal is to promote individuals' right to informational self-determination on the Internet.	Socially Responsible Artificial Intelligence, Trustworthy Artificial Intelligence
D. Someshwar et al. [8]	2020	The paper is about the technology and interface that was created to allow deaf mutes to use various speech automated virtual assistants using Sign Language.	Deep Learning, Convolutional Neural Network, Tensor Flow, Python Audio Modules
Campagna, G et al. [9]	2019	In the research, they propose formalising virtual assistant capacity with a Virtual Assistant Programming Language (VAPL) and translating natural language into VAPL code using a neural semantic parser.	Semantic Parsing, Training Data Generation, Data Argumentation, Data Engineering
V.NARMADH A J.U. AJAY KRISHNAN et al. [10]	2019	The purpose of the study is to have the virtual assistant respond to user requests that are made through thought. The user thinks of the task, and the personal assistant processes it without the user providing any written or auditory input.	Brain Computer Interface, Machine Learning, Artificial Neural
Roca,S. Hernández, M. et al. [11]	2019	The paper outlines the ongoing efforts to create increasingly intelligent MVAs that can detect and understand speech input with a vast vocabulary across a number of activities.	Speech Recognition Modules, Language Model Adaptation, Adaptive Learning

Proposed Methodology: -

The study began with an analysis of the user's auditory commands delivered through the microphone. This might include anything from obtaining information to manipulating a computer's internal files. This is an empirical qualitative research based on reading the material indicated above and putting the instances to the test. The tests are created by programming in accordance with books and internet resources, with the specific purpose of discovering best practises and a deeper understanding of Voice Assistant. It depicts the workflow of the voice assistant's fundamental process. The spoken input is converted to text using speech recognition. This text is then passed to the central processor, which detects the command's type and invokes the appropriate script for execution.

Key Terminology: -

Artificial Intelligence: -

Artificial intelligence (AI) is the ability of a computer or a computer-controlled robot to accomplish tasks that are normally performed by intelligent beings. The phrase is widely used to refer to a project aimed at creating systems with human-like cognitive abilities, such as the ability to reason, discern meaning, generalise, and learn from past experiences.

Speech Recognition module: -

The device converts speech to text using Google's online speech recognition algorithm. The voice input Users can get texts from specialised corpora arranged on the information center's computer network server, which are briefly stored in the system before being forwarded to Google Cloud

for speech recognition. The central processor receives the comparable text and processes it.

Python Backend: -

The python backend receives the voice recognition module's output and determines whether the command or speech output is an API Call with Context Extraction. The output is then transmitted back to the Python backend to provide the user with the desired results.

API calls: -

API stands for Application Programming Interface. An API is a software interface that enables two apps to communicate with one another. In other words, an API is a messenger that sends your request to the provider and then returns the response to you.

Conclusion

In this paper, "**Virtual Assistant**" We examined the design and implementation of Digital Assistance. The project is constructed utilizing open-source software modules with community support via "**Visual Studio Code or PyCharm**," allowing for quick updates. Because

this project is modular, it is more adaptable and easier to add new features without disrupting existing system functionality. In addition, the application should reduce any needless manual labour required by the user to complete each activity. The entire system is based on verbal input rather than the subsequent one.

Future enhancement

Although the existing virtual assistants are quick and responsive, we still have a long way to go. The existing systems' knowledge and dependability need to be greatly enhanced. In crucial situations, the helpers available now are still unreliable. Virtual assistants will be integrated with these aides in the future machine Learning, Neural Networks, and IoT are examples of artificial intelligence. Because of the addition of we shall be able to reach new heights thanks to this technology. What virtual assistants can accomplish is well beyond what we have accomplished thus far. Although Jarvis, a voice-activated virtual assistant created by Iron Man, is fictitious, it has set new expectations for what we may achieve with voice-activated virtual assistants.

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