



AUTOMATED SEARCH ENGINE BY VIRTUAL ASSISTANT USING ARTIFICIAL INTELLIGENCE

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ABSTRACT

An intelligent virtual assistant (IVA) or Intelligent personal assistant (IPA) may be a program or software agent which will perform a particular task or services for an individual. It also provide a services for a private supported command or questions. One of the goal of Artificial Intelligence (AI) is the realization of Natural dialogue between human and machine. It is design to stimulate human would behave like a conversational partner. In recent years, the dialogue system also know an interactive conversation system are fastest growing in AI. The main application of virtual assistance is growing fast in our personal and professional life. Many company have used the dialogue system technology to establish various king of Virtual Personal Assistant (VPA) based on their application and their particular areas, such as Microsoft's Cortona, Apple's Siri, Alexa from amazon, Google Assistant and Facebook's M. The new system of VPAs will be used to increase the interaction or conversation between the human and machine by using different technologies, such as synthesis voice, image/video recognition, speech recognition, conversational knowledge base, and the general knowledge base.

Some virtual assistant are ready for interpreting human speech and via voice synthesis user. User may use voice command to request there VA to answer the Query, manage home appliances, control media playing, and handle there essential activity like email, creating the to do list and organize the meeting on calendar.

Keywords: VPA, NLP, Text To Speech, Machine Learning, Artificial Intelligence, Deep Learning.

1. INTRODUCTION

In the Subject of Artificial Intelligence, there has been a lots of progress recently. The digitalization of the world made sure that humans no need to contact anyone else to seek help, they could not particular task. The place of the human is replace by the digital reliable devices which can take care of their everyday needs. The computers, mobiles, laptop, etc., to become a part of us and our simple calculations to complex program to reduce monotonous work and save waste of manpower. The name of Virtual Assistance we are created is Ronick's. This Virtual Assistance is an intelligent application that can perform task and provide the services for a person. My virtual assistance Ronick's can make life easier relatively new integration in VPA. Large technology companies have their own intelligent virtual assistance for different purposes and platforms. At first the virtual purpose of such as assistant was to answer the user's question, but a point to enhance it further with more capabilities and responsibilities. Ronick's Virtual Assistance is an artificial intelligence powered VIRTUAL assistance develop that is primarily used only computer and laptop devices. The Ronick's VIRTUAL assistance can engage in two conversations.

Introduction to Python

Python is an interpreter language, interactive, object-oriented programming language. Interpreted language do not need to be compiled at run time. A program called as interpreter. It runs Python code of almost any kind of computer. The main drawback of python is slower than a compiled language like C, because it is not running machine code directly.

Python is one of the most popular programming languages, which is used by developers today. Guido Van Rossum is created in 1991 and ever since its inception has been one of the most widely used languages along with C++, Java, etc.

Python is good programming language to beginners, because python is just like a English language it is called as high level language. Which means that programmer can only focus on what to do instead of how to do it. The main advantages of python is writing program in Python takes less time than in some any other languages. Python drew inspiration from other programming languages like C, C++, Java, Perl, and Lisp.

2. LITERATURE SURVEY

The fields of virtual assistance having speech recognition have ultimately seen some major innovations, growth and evolution. It happens mainly because of its mostly demanded services like smart watches or Bluetooth earphones, mobile phones, laptop or computers, tablets, television etc. this of the following devices which are coming nowadays are coming with voice assistance which help to control devices which speech recognition only. A various set of technique is newly invented and being develop constantly to improve the performance of voice automated search.

With the help of voice assistance, we can automate the task easily, just give the input to the machine in the speech form and all the task will be done by it forms of converting your speech into text form to taking out keywords form that text and also execute the query to give results to the customers and end users.

In 1990s digital speech recognition technology became a feature of the personal computer with IBM, Philips and Lernout & Hauspie fighting for customers. The first modern digital virtual assistant is installed on our smartphone or iPhone was Siri, which was firstly introduced as a great feature of the iPhone 4S on 4 October 2011. After that in 2013 Alexa was developed, Amazon Alexa, also known simply as Alexa, is technology largely based on a polish speech synthesiser named Ivona, bought by Amazon. It was first used in the Amazon Echo smart speaker and the Echo Dot, was developed by Amazon Lab126. After that various virtual assistant like Google Assistant, Cortana, Chatbot s are available in market with their own technology and different advantages.

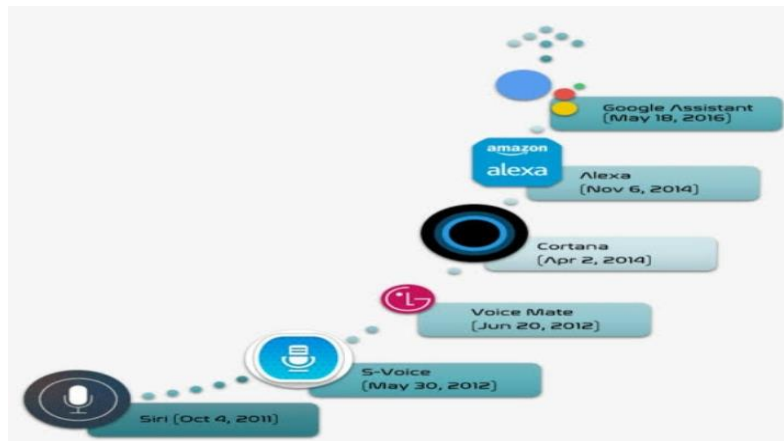


Fig. 1 literature survey of Virtual Assistant

3. FEATURES OF RONICK'S VIRTUAL ASSISTANT

Ronick's virtual assistant is able to interpret human speech and respond with the help of synthesis voices. Users can ask their assistants questions, media playback via voice, and manage other basic and important task such as make a to-do lists, set alarm, calendars with verbal commands. Ronick's virtual assistant is also perform the essential activity such as sending the mail and response the mail, organize meetings. They are respond various voice commands, send text message, make a phone calls and open the various application like YouTube, chrome, Google, etc.

4. SYSTEM ARCHITECTURE

Block Diagram of Ronick's virtual Assistant

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PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE

Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\python tutorial> & "C:/python tutorial/python.exe" "c:/python tutorial/RoNick's/RoNick's.py"
Listening...

```

Fig.2 Machine listening to users

```
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\python tutorial> & "C:/python tutorial/python.exe" "c:/python tutorial/RoNick's/RoNick's.py"
Listening...
Recognizing...
```

Fig.3 Machine Listening to the user

```
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\python tutorial> & "C:/python tutorial/python.exe" "c:/python tutorial/RoNick's/RoNick's.py"
Listening...
Recognizing...
User said: Raunak open Google
```

Fig.4 Machine displays the user input

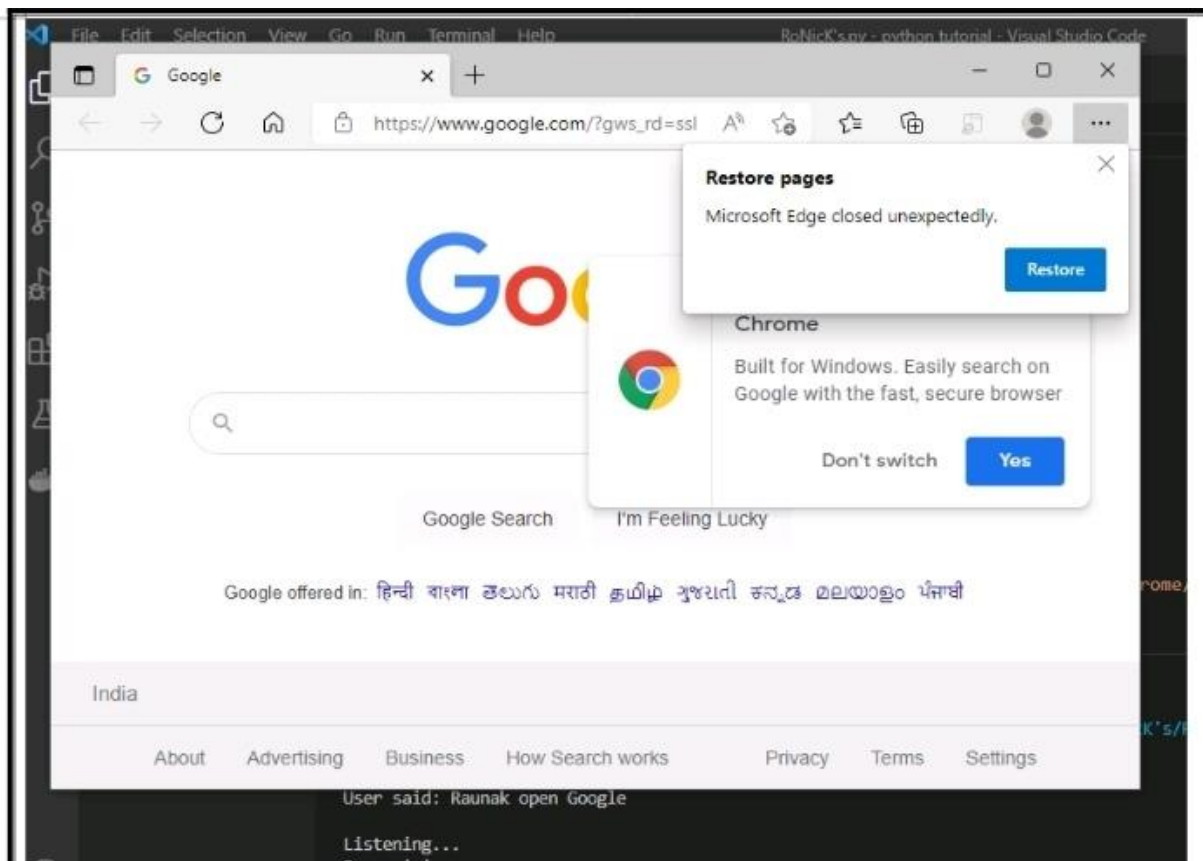


Fig.5 Machine display the user input

5. METHODOLOGY OF RONICK'S VIRTUAL ASSISTANT USING PYTHON

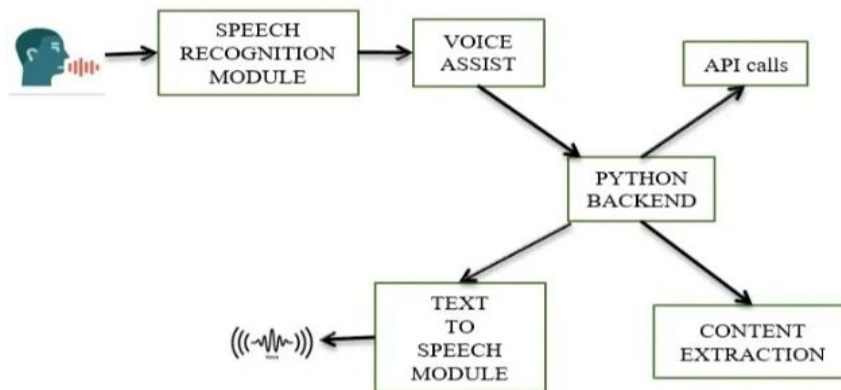


Fig.6 Detailed workflow

Speech Recognition module:

The system uses Google's online speech recognition system for translating speech into text. The speech input Users can obtain texts from the special module organized on the server at the data centre from the microphones is temporarily stored in the system. The python backend gets the output from the speech recognition module and after that it identifies whether the command or voice output is an API Call and Context Extraction.

Voice assistant:

Voice assistants improve the productivity of software, it can also improve safety of the system. Voice assistant is an intelligent application that can perform the task. User may use voice command to request virtual assistant to answer the query. The output is then sent back to the python backend it used to give the required output to the customer or user.

API calls:

API stands for Application Programming Interface. An API is a software intermediary that allows two application to talk to each other. It also expanded in other words, an API is a messenger that delivers your request to the provider that you're requesting it from and then delivers the response back to you.

Content Extraction:

Content Extraction (CE) is the task of automatically extracting a particular structured information from unstructured or semi structured machine readable documents. This activity processing human language text using natural language processing (NLP)

Text-to-speech module:

Text-to-speech (TTS) refers to ability of computers to read text aloud. A TTS Engine converts a written text to a phonemic representation, to waveforms that can be output as sound .TTS engines with different languages, dialects and specialized vocabularies are available through the third-party publishers.

6. HARDWARE AND SOFTWARE REQUIREMENTS

Hardware:

- A smart phone with a touch screen interface.
- Phone ram memory should be of a minimum 512MB.
- High internet connectivity
- Laptop of Computer
 - Processor – intel ® Celeron®
 - RAM: 4GB

ROM: 1TB
System Type: 64-bit Operating System

- Android Handset

Software requirements:

- Visual Studio Code
- Python – 3.6.8 (For Windows 64 Bit)

7. EXISTING AND PROPOSED SYSTEM

Existing Model

Most of the existing projects have only used speech recognition with the help of neural networks. These systems have a moderate accuracy, they are not for practical usage nor efficient to be of any real use. There are a few primitive techniques used by them:

1. Context-aware computing:

Context-aware computing is a class of systems that have the ability to sense their physical environment and adapt themselves to it accordingly to the condition. These also can be used for recognizing words spoken by people with varying accents. It can deduce words that may have been misspoken.

2. MFCC:

MFCC refers to the Mel Frequency Cepstral Coefficients. MFC is a collection of these coefficients. It amounts to be given as short-term power spectrum of a sound. These can be used to sense variations in sound so as to recognize the various variables required for voice recognition with the help synthesis voice.

3. NLP:

- Natural Language Programming one of the most important branch of Artificial Intelligence that deals with the interactions of computer and human languages. It mainly focuses on how to program the computers so that they can process the large number of data on natural languages. This concept is used to perform the task of familiarize the computer with the various words in a particular language and also to recognize them when spoken.

8. PROPOSED MODEL

Speech to text

- A Piece of software used that transform audio to text. It does not understand just anything you say.

Text Analysing:

- Converted text is a just letters for computer.
- A piece of software converts text to something is Understandable to computer.
- Computer understands the command, so other Virtual Assistant like Siri convert this text to computer command.
- VPA's maps the words for functions and parameters to creating a command, computer can understand.

The major milestone that this project tries to achieve is that it tries it also increase the accuracy of the speech to text software. Meaning the software will theoretically be able to convert in any speech with slight modulations or different accents into text with high level of accuracy and precision needed for day to day usability of the VPA. The software essentially combines voice recognition using neural networks and lip movement detection using machine learning to increase the precision of word spoken.

For people with different accents, just voice recognition will be useless because of the words they speak will be vastly different from the actual word by the computer's point of view because the vectors or the values stored for that particular given word would have been gotten only based on the word being spoken in a particular accent. So here is lip movement recognition comes into play. For most words, though in a different accent, the movement of the lips remains similar enough to deduce words. Thus, lip movement recognition helps cutting down of various other words which would have had the same likeliness as per the using voice recognition software.

9. CONCLUSION

The paper describes a new emerging service for desktop user. The Ronick's Virtual assistance provides an intelligent secretarial service for desktop professionals. The new service is based on convergence of internet, speech recognition technology by using synthesis voice. The Ronick's virtual assistant minimize the interruption of the user, improve the utilization of his time, and provides a single point of communication for all his contacts, messages, schedule and source of information. The paper purposes as well a decision structure for manage all essential activity, manage to do list, playing control media, etc. However, it expected to become a standard feature for millions of other users.

It also overcomes many of the drawbacks in the existing system and provide the solutions. But the system has its own limitation. Though the efficiency is high the time consumption for each task to complete and provide the solution of the complexity of algorithms and the concept would make it very tough to tweak needed in the future

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REFERENCES

- [1] Buck, J.W., Perugini, S. and Nguyen, 2018, January. Natural Language, Mixed-initiative Personal Assistant Agents. This Proceedings of 12th International Conference on Ubiquitous.
- [2] Janson, A., Eigenbrod, L. and Söllner, M., 2018. What and how of Smart Personal Assistants: Principles as well as Application Domains for IS Research.
- [3] Hoy, Matthew B. (2018), Alexa, shri, cortana, and more: An introduction to Voice Assistants. Medical Reference Services Quarterly 37 (1):81-88
- [4] Samuel Gibbs (2017-02-07). Amazons Alexa escapes the Echo and gets into cars / Technology.
- [5] Tajane, Kapil, et al. "AI-Based Chat-Bot Using Azure Cognitive Services." 2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA). IEEE, 2018.
- [6] Veton Kepuska and Gamal Bohota "Next generation of virtual assistant (Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home)" IEEE conference, 2018. web page (online)
- [7] <https://www.pyimagesearch.com/2017/05/08/drowsiness-detection-opencv>
- [8] Chung, H. and Lee, S., 2018. Intelligent virtual assistant knows your life. arXiv preprint arXiv:1803.00466.
- [9] Lamontagne, L., Laviolette, F., Khoury, R. and Bergeron-Guyard, A., 2014. A framework for building adaptive intelligent virtual assistants. In Proceeding of the 13th IASTED international conference on artificial intelligence and applications (pp. 17-19).
- [10] Nasirian, F., Ahmadian, M. and Lee, O.K.D., 2017. AI-based voice assistant systems: Evaluating from the interaction and trust perspectives.
- [11] Arora, S., Athavale, V.A., Maggu, H. and Agarwal, A., 2020. Artificial Intelligence and Virtual Assistant—Working Model. In Mobile Radio Communications and 5G Networks (pp. 163-171). Springer, Singapore.
- [12] de Barcelos Silva, A., Gomes, M.M., da Costa, C.A., da Rosa Righi, R., Barbosa, J.L.V., Pessin, G., De Doncker, G. and Federizzi, G., 2020.
- [13] Intelligent personal assistants: A systematic literature review. Expert Systems with Applications, 147, p.113193. 11. Elshafei, M., Virtual personal assistant (VPA) for mob

-
- [14] Ardissono, L., Boella. And Lesmo, L. (2000) "A Plan-Based Agent Architecture for Interpreting Natural Language Dialogue", International Journal of Human-Computer Studies.
- [15] [https://en.Wikipedia.org/wiki/virtual assistant](https://en.Wikipedia.org/wiki/virtual_assistant)
- [16] <https://www.w3schools.com/phython/>
- [17] <https://www.ibm.com/cloud/Watson-assistant/>
- [18] <https://www.pyhton.org/>
- [19] <https://voicebot.ai/2017/07/14/timeline-voice-assistants-short-history-voice-revolution/>
- [20] <https://codetiburon.com/ai-mobile-apps-make-app-like-stri/>
- [21] <https://www.javapoint.com/phython-tutorial>