

VIRTUAL ASSISTANT FOR BLIND PEOPLE

Avanish Vijaybahadur Yadav¹, Sanket Saheb Verma², Deepak Dinesh Singh³

Computer Science Department, Shree Lr Tiwari College Of Engineering Thane, India^{1,2,3}

Avanish.yadav@slrtce.in, sanket.verma@slrtce.in, Deepak.singh@slrtce.in

Abstract: - In today's advanced hi-tech environment, the need for self-sufficiency is recognised in the situation of visually impaired people who are socially restricted. They are in an unfamiliar environment and are unable to help themselves. Because most tasks require visual information, visually impaired people are at a disadvantage because crucial information about their surroundings is unavailable. It is now possible to extend the support provided to people with visual impairments thanks to recent advancements in inclusive technology. This project proposes to use Artificial Intelligence, Machine Learning, Image and Text Recognition to assist persons who are blind or visually impaired. The concept is realised using an Android mobile app that includes features such as voice assistant, image recognition, currency recognition, e-book, and chat bot. The software can recognise items in the environment using voice commands and do text analysis to recognise text in a hard copy document. It will be an effective approach for blind individuals to engage with the world and make use of technology's features.

I INTRODUCTION

A virtual assistant is a self-employed individual who specialises in providing clients with administrative support. Typical task of virtual assistant might perform the operation such as greeting user, opening different applications, performing multimedia operations and many more.

Basically we are making this system for the help of blind people, blind people who are working or using computer for some purpose, this project is to make their work easier and reduce their problem.

II LITERATURE REVIEW

Title	Author	Summary
i) Natural human-computer interaction for virtual personal assistant systems	William C. DeLeeuw	A computing device configured to take audio input, distort the audio input to produce a number of distorted audio variations, and perform speech recognition on the audio input and the distorted audio variants is one of the technologies for natural language interactions with virtual personal assistant systems. Based on contextual information, the computing device chooses a result from a vast number of possible voice recognition results. The computing device may utilise an eye tracking sensor to assess whether the user is visually focused on an avatar rendered by the virtual personal assistant in order to assess the user's level of engagement.
ii) Next-generation of virtual personal assistants (Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home)	Veton Kepuska	The development of natural interaction between humans and machines is one of the aims of artificial intelligence (AI). In recent years, the fastest developing topic in AI has been dialogue systems, sometimes known as interactive conversational systems. Many firms have employed dialogue systems technology to create several types of Virtual Personal Assistants (VPAs) based on their applications and areas, such as Microsoft's Cortana, Apple's Siri, Amazon's Alexa, Google Assistant, and Facebook's.

III PROBLEM STATEMENT

Virtual assistant has become very useful over the past few years. Some of the famous virtual assistants are Alexa, Siri, Google assistant, Bixby etc.

However, these are the advanced level of virtual assistants and not everyone can afford the assistant devices like alexa or iPhone for siri.

So to get the experience like using these advanced level of virtual assistant, we are also making a virtual assistant for windows.

Our virtual assistant will be intermediate level of assistant.

IV. PROJECT OBJECTIVE

We are making our project for blind people so we will implement functionalities from their point of view.

The first and the most basic objective is to make a system that can recognise the users speech and reply on those commands. A system that can do the basic functionalities like introducing itself with user, greeting user, telling time or date or day.

To make a system that can operate for the work which requires the use of web browser like opening chrome, opening youtube or searching on wikipedia etc.

Also, to make a system which can open various applications for user after getting the voice commands from user.

We will implement a function so that our virtual assistant can do the arithmetic operations as well.

Once all of these features are implemented in our virtual assistant then we will try to add some more functionalities in it to make it more helpful.

V. REQUIREMENT ANALYSIS Software Interface:

Pycharm Community Edition

Visual Studio Hardware Interface:

Development operating system: Windows OS

RAM: 2GB and more (Recommended: 4GB)

Processor: i3 and above (Intel Core Processor)

VI. ALGORITHM FOR SPEECH GENERATION

Step1) import pyttsx3 library

pyttsx3 is a text-to-speech conversion library in Python. Unlike alternative libraries, it works offline, and is compatible with both Python 2 and 3.

Step2) Initialize sapi5 using pyttsx3.init() method Microsoft Speech API (SAPI5) is the technology for voice recognition and synthesis provided by Microsoft.

Step3) Set male or female voice using engine.setProperty() method

Step4) Define a method and give parameter in it.

Step5) Then here the virtual assistant voice using engine.say() method

Step6) import speech_recognition as sr

Used to recognise users speech

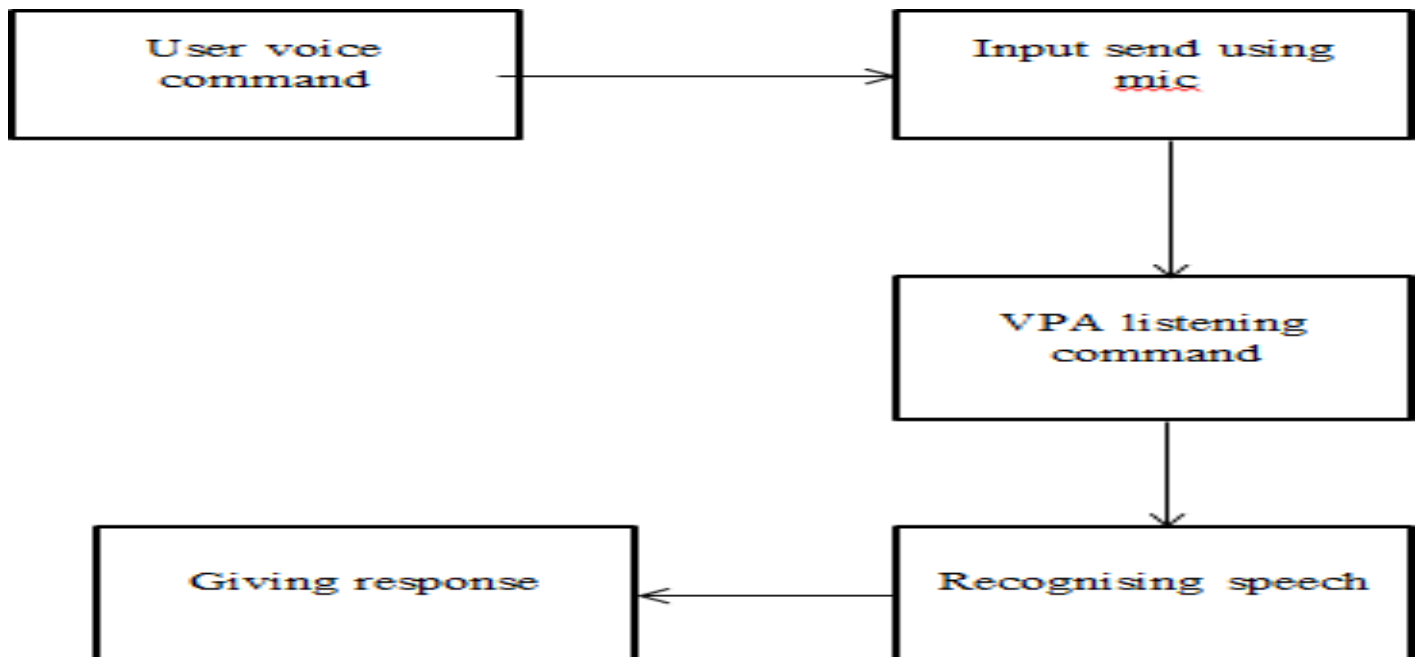
Step7) Use sr.Recognizer() method to recognition.

Step8) Then use sr.Microphone() as a source to speech recognition

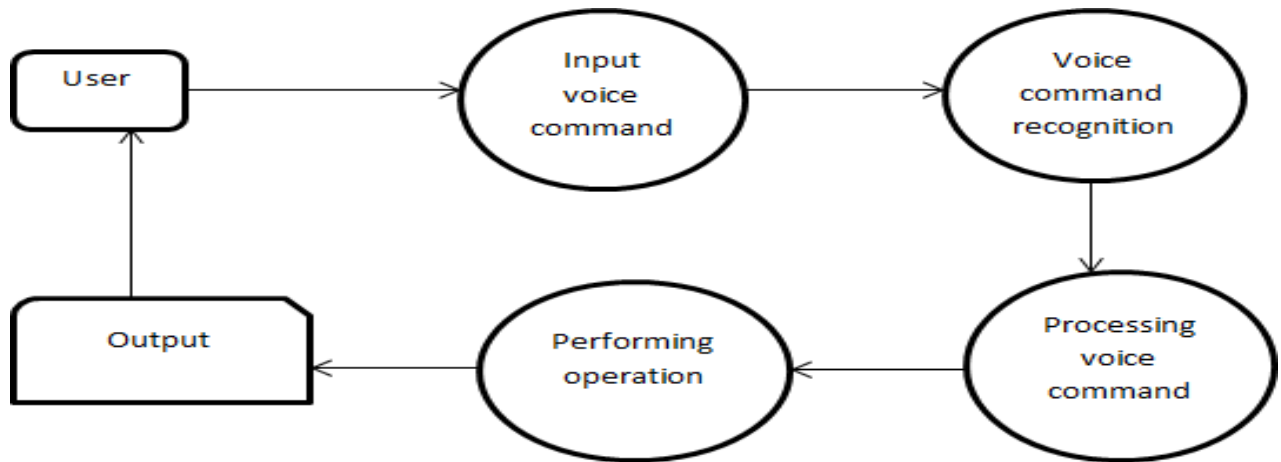
Step9) Then input audio using r.listen() method

Step10) Then use recognize_google() method to understand audio input which will be in English -India format.

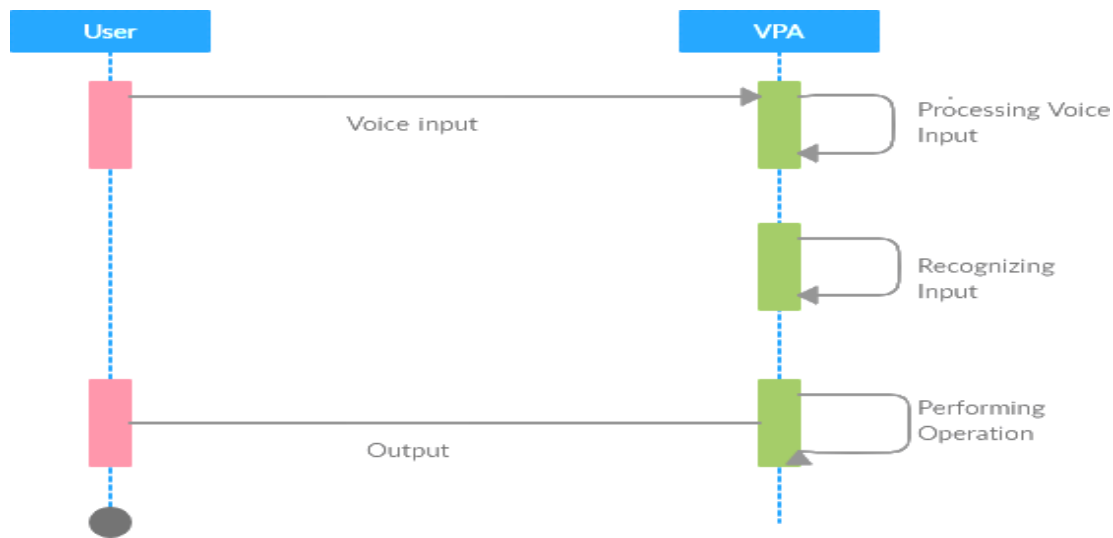
VII PROPOSED SYSTEM



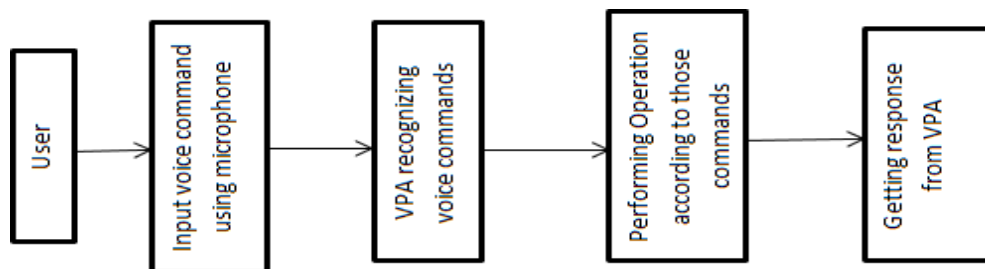
DFD(DATA FLOW DIAGRAM)



SD(SEQUENCE DIAGRAM)



CONTROL FLOW DIAGRAM



VIII .FUNCTIONALITIES

- Searching in Wikipedia
- Opening stack overflow
- Playing music
- Telling time
- Opening visual studio code
- Searching in Google
- Searching in YouTube
- Getting time in USA

How to mode

IX.CONCLUSION

The proposed system will act like an intermediate level of virtual assistant. It will perform more and more numbers of operations and do it easily for user. The main objective of this system is to reduce the user task and do it by itself for the user. In future, we can take our system to next level and make it advanced level of virtual personal assistant which can do almost all the operation which is done by the user.

REFERENCES

- 1]Pilling, D., Barrett, P. and Floyd, M. (2004). Disabled people and the Internet: experiences, barriers and opportunities. York, UK: Joseph Rowntree Foundation, unpublished.
- [2]Porter, P. (1997) 'The reading washing machine', Vine, Vol. 106, pp. 34–7
- [3]JAWS - <https://www.freedomscientific.com/products/software/jaws/> accessed in April 2020
- [4]Ferati, Mexhid & Vogel, Bahtijar & Kurti, Arianit & Raufi, Bujar & Astals, David. (2016). Web accessibility for visually impaired people: requirements and design issues. 9312. 79-96. 10.1007/978-3-319-45916-5_6.
- [5]Power, C., Freire, A.P., Petrie, H., Swallow, D.: Guidelines are only half of the story:accessibility problems encountered by blind users on the web. In: CHI 2012, Austin, Texas USA, 5–10 May 2012, pp. 1–10 (2012)
- [6]Sinks, S., & King, J. (1998). Adults with disabilities: Perceived barriers that prevent Internet access. Paper presented at the CSUN 1998 Conference, Los Angeles, March. Retrieved January 24, 2000 from the World Wide Web
- [7]Muller, M. J., Wharton, C., McIver, W. J. (Jr.), & Laux, L. (1997). Toward an HCI research and practice agenda based on human needs and social responsibility. Conference on Human Actors in Computing Systems. Atlanta, Georgia, 22–27 March.
- [8]Kirsty Williamson, Steve Wright, Don Schauder, Amanda Bow, The internet for the blind and visually impaired, Journal of Computer-Mediated Communication, Volume 7, Issue 1, 1 October 2001, JCMC712
- [9]Deeppavlov documentation <http://docs.deeppavlov.ai/en/master/features/models/squad.html> accessed in April 2020
- [10]The website for American foundation for the blind <https://www.afb.org/about-afb/what-we-do/afbconsulting/afb-accessibility-resources/challenges-web-accessibility> accessed in April 2020
- [11]Ryle Zhou, Question answering models for SQuAD 2.0, Stanford University, unpublished.
- [12]Global data on visual impairments 2010 by World Health Organisation (WHO)<https://www.who.int/blindness/GLOBALDATAFINALforweb.pdf?ua=1>