

Voice Based E-Mail Service For Visually Impaired People

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ABSTRACT

Communication is one of the most important aspects of human life. In the recent times, numbers of technologies based on internet have been developed to make the communication as a more reliable and efficient in nature. Out of this numerous applications, E-mail is the most widely used and reliable way to communicate with each other. The existing system is not so effective for blind people. Our proposed system has enabled the Blind people to send and receive voice based e-Mail messages. The python script is used to design the system. The system uses python libraries like tensor flow, Pyglet, opencv and keras.

Keywords: communication, E-mail, Python script, tensor flow, pyglet, Keras, opencv

I. Introduction

Email is most widely used communication media among all the methods, especially in the business world. With the boom in internet technologies, the communication has become a lot easier. Internet is considered as the vault of innovation, technologies and information. Numerous networking and social media sites. All of these technologies can be of no use to the people who are visually impaired as all activities that can be performed on the computer are based on visual perception.

There are different advances given to them such as Automatic speech recognizer, screen reader, text to speech to speech to text, braille console and so on. Internet is considered as a major storehouse of information in today's world. No single work can be done without the help of it.

It has even become one of the de facto methods used in communication If that is not visible it is of no use. This makes internet a completely useless technology for the visually impaired and illiterate people. Even the systems that are available currently like the screen readers TTS and ASR do not provide full efficiency to the blind people so as to use the internet. The voice based email system include many services sending mail, read the number of mails, read the mails in the inbox, the system improves accuracy of message content given by the user with the help of the voice commands, it enables the user to send multiple messages to the recipient.

The voice based email system uses the IMAP protocol in the Google mail settings and with the help of the imap protocol it allows the user to receive and send mails to the recipient. It uses the tensor flow libraries in the python spyder. The system allows a visually impaired person to record her voice and instead of converting the speech to text, the system directly sends the recorded voice message to the recipient's mail address as an attachment.

II. Existing System

General Email System

The pre dominant mail service can be used by only a normal person. HTML formatted emails are not created with accessibility in mind. For the visually challenged password is not secured in the email system. The visually challenged people cannot view the screen to read out the content, since all the web applications has been designed till date depends on the use of normal people.

The existing mail service does not provide flexible access to the visually challenged people. Because they are in written format and there is no read out option to hear the mail that is received to their mail address. Despite we have screen readers to access the desktop application for the people who have that disability since they do not have application to access the web application. The main use of using the internet is to communicate with others and to interchange their information which is provided by email service. Still the existing system of mail

service fails in providing the flexibility to the people in need. Due to these demerits in the current system, we can overcome that in the application we are going to develop and implement.

III. Proposed System

Voice mail service for visually impaired people

The project aims at developing an email system that will help even a naive visually impaired person to use the services for communication without previous training. The system will not let the user make use of keyboard and mouse operation for speech conversion to text. Also this system can be used by any normal person also for example the one who is not able to read. To know the received (unseen) message to read the subject and body of the message and compose a mail with user mail id and password finally logout the system. The complete system is based on Text-to-speech and Speech-to-text. This voice email not just made for blind people, anyone can access it.

STT (Speech-to-text), here whatever we speak is converted to text. Their will a small icon of mike on whose clicking the user had to speak and his/her speech will be converted to text format, which the naked people would see and read also. TTS (text-to-speech) this, method is full opposite of STT.

The voice based email service uses the IMAP protocol in the Google mail settings and with the help of the imap protocol it allows the user to receive and send mails to the recipient. It uses the pyttsx3 to convert the text to speech, the system uses the pyaudio to take the voice commands from the user. It uses the tensor flow, opencv, keras libraries in the python spyder. The system helps the visually impaired people to send and receive the voice mails.

The proposed system reads the inbox voice mails for the visually impaired people. The system uses the google text to speech application for converting the text in the inbox message to the voice command.

IV. System Design And Implementation

User Interface

The user interference is designed with the help of the web application that is python spyder. The user interface enables the user to use the all services provided by system. The system is primarily developed for the visually challenged people. The user interface consists of complete data, which helps the user to utilize the sytem effectively.

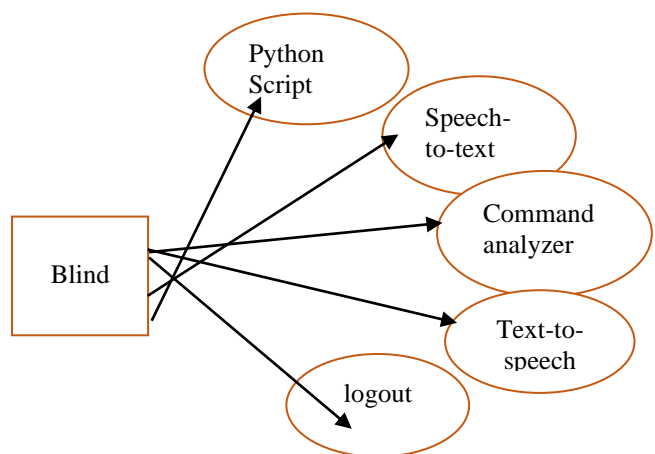
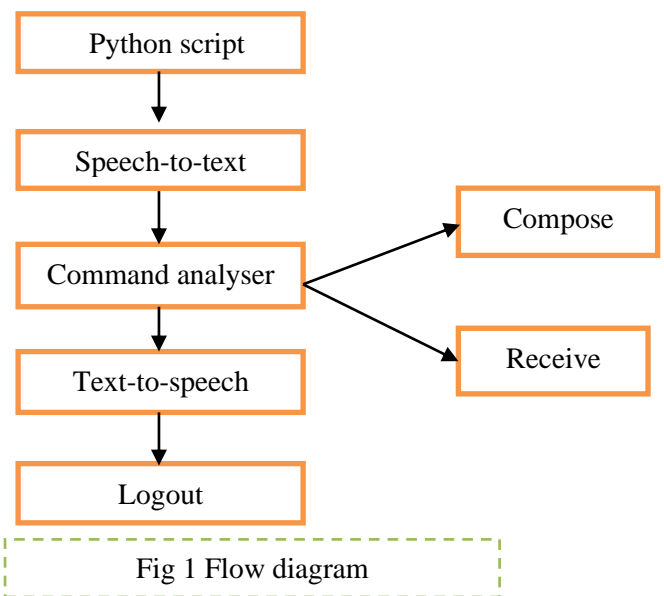
Designing of system

The system design is as shown in the flow diagram. The sequential diagram shows the sequence of events performed by the system. The user case

diagram shows the design of the user system. The system do not require mouse and keyboard because it takes the voice input from the user.

The voice based email system include many services sending mail, read the number of mails, read the mails in the inbox, the system improves accuracy of message content given by the user with the help of the voice commands, it enables the user to send multiple messages to the recipient.

The fig1 depicts the flow diagram, fig 2 depicts the user case diagram.



The system is developed using python script. The following are the modules. The working of modules is as shown below.

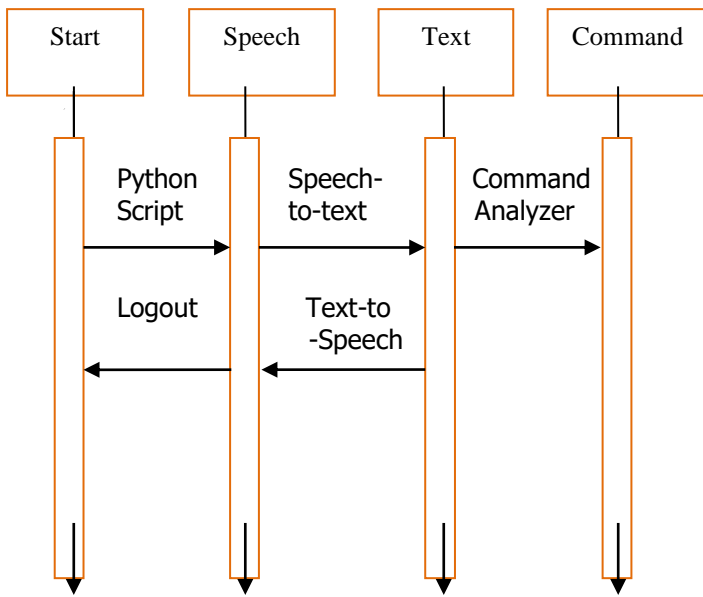


Fig.3:Sequence diagram

A. Speech-to-text

The systems obtain speech at run time through a microphone and with the help of speech-to-text converter the speech gets converted into text. Speech-to-text converter recognizes the speech analysed the sounds you make by filtering what you say then it digitized it to a format it can read. Python platforms are used here to develop this. Our speech to-text system directly obtains and converts speech to text. It can add-on other larger systems, giving users a different choice for data entry. Analog speech signal must first be sampled at time and amplitude axes, or digitized. Samples of the

speech signal are analysed in even intervals. Speech feature extraction involves the formation of equally spaced discrete vectors of speech characteristics. Feature vectors from training database are used to estimate the parameters of acoustic models.

B. Command analyzer

Command analyser will analyse the corresponding module through the text input. Execute that module and generate a result to the main module.

C. Text-to-speech

Using speech synthesis techniques it converts text to voice output. It used by the blind to listen to written material. Text-to-speech is also used on devices such as portable GPS units to announce street names when giving directions. Our Text-to-Speech Converter accepts a string of 50 characters of text (alphabets and/or numbers) as input.

D. Compose mail

In this module get a voice input from the blind. Connect to the mail server with help of IMAP protocol. Login with correct user id password. Send the mail with recipient mail id.

E. Read received mail

Read the received mail with sender mail id. It also reads the subject and body of the mail.

V. System Results

The below figures shows the outputs of the system.

```
Python 3.7.3 (default, Mar 27 2019, 17:13:21) [MSC v.1915 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 7.4.0 -- An enhanced Interactive Python.

In [1]: runfile('C:/Users/lenovo/Desktop/voicemail/_init_.py', wdir='C:/Users/lenovo/Desktop/voicemail')
Welcome to voice based email for blind
To whom do you want to send an email?
I'm listening, Go on
Recipient a t c
Do you want to send email to slvbhavani123@gmail.com Say ok or not
I'm listening, Go on
What is the Subject of this e-mail?
I'm listening, Go on
You said : new project
Do you want to continue? retry? append?
I'm listening, Go on
What is the body of the email?
I'm listening, Go on
You said : I want to send a new mail
Do you want to continue? retry? append?
I'm listening, Go on
Before sending the email do you want to listen it out? Say ok or not
I'm listening, Go on
Subject is : new project
Body is : I want to send a new mail
Do you want to send this email? Say ok or not
I'm listening, Go on
Sending mail
Your mail has been sent.
```

Fig.3: Output result of mail sent

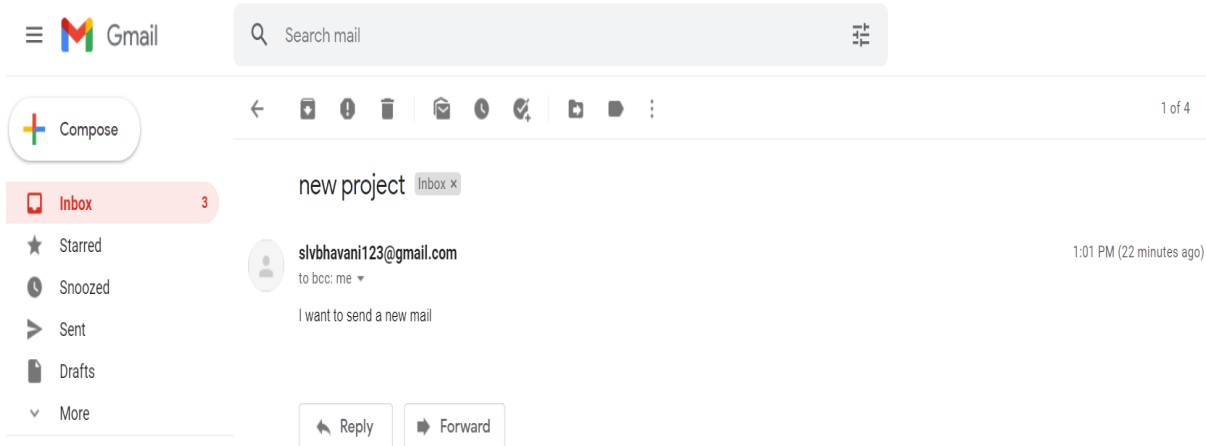


Fig.4: Output image of inbox mail

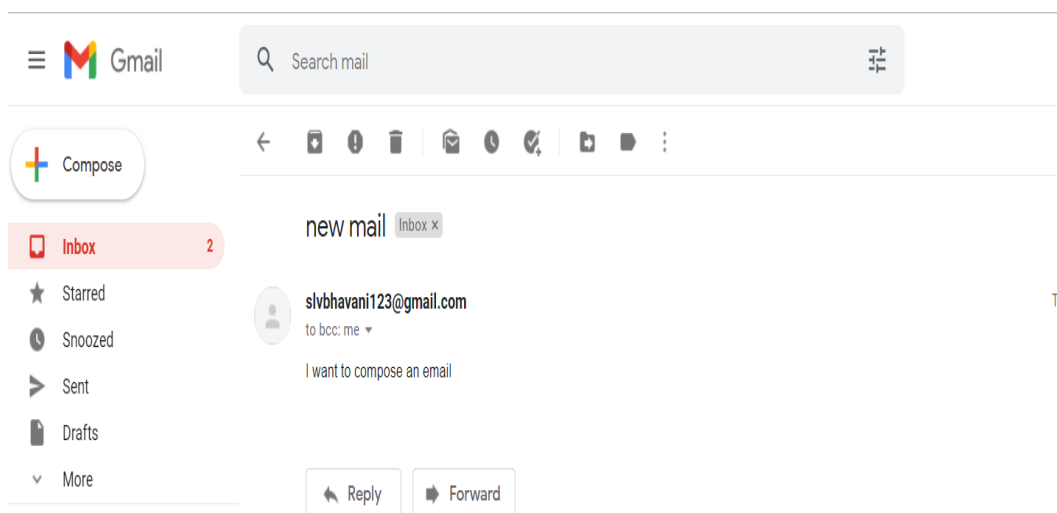


Fig.5: Output image of received mail

```
In [1]: runfile('C:/Users/lenovo/Desktop/voicemail/_init_.py', wdir='C:/Users/lenovo/Desktop/voicemail')
Welcome to voice based email for blind
To whom do you want to send an email?
I'm listening, Go on
Recipient a t c
Do you want to send email to slvbhavani123@gmail.com Say ok or not
I'm listening, Go on
What is the Subject of this e-mail?
I'm listening, Go on
You said : Bhavani
Do you want to continue? retry? append?
I'm listening, Go on
What is the body of the email?
I'm listening, Go on
You said : I want to send an email to someone X person
Do you want to continue? retry? append?
I'm listening, Go on
Before sending the email do you want to listen it out? Say ok or not
I'm listening, Go on
Subject is : Bhavani
Body is : I want to send an email to someone X person
Do you want to send this email? Say ok or not
I'm listening, Go on
Mail discarded.
```

Fig. 6: Discarded mail output

VI. Conclusion

The Voice Email is a System which helps the blind and handicapped people to access mails easily and efficiently. It provides a voice based mailing service where the visually impaired person could read and send and receive mail by their own without the help of others.

We have eliminated all these concepts and overcome all difficulties faced by blinds. It uses speech recognition application which provides an efficient voice input method for mailing devices for blind. It is also useful for handicapped and illiterate people to send the mails and receive mails. The

system helps the blind people to send the emails and chat using email.

References

1. "Voice based email system for blinds" T. Shabana¹, A. Anam², A. Rafiya³, K. Aisha⁴ Assistant Professor, Computer Engineering, M.H. SabooSiddik College of Engineering, Mumbai, India ¹ UGStudent, Computer Engineering, M.H. SabooSiddik College of Engineering, Mumbai, International Journal of Advanced Research in Computer and Communication Engineering

2. "Voice Based System in Desktop and Mobile Devices for Blind People" Jagtap Nilesh, Pawn Alai, Chavhan Swapnil and Bendre M.R., In International Journal of Emerging Technology and Advanced Engineering (IJETAE),
3. "VMAIL: Voice Based Email Application "Rahul Anwani Usha Santuramani Deeksha Raina Priya R.L, International Journal of Computer Science and Information Technologies, Vol. 6 (3)
4. "Voice Based Search Engine and Web page Reader", Ummuhansifa U. Nizar Banu P K, In International Journal of Computational Engineering Research
5. "An Interactive Email for Visually Impaired", G. Shoba, G. Anusha, V. Jeevitha, R. Shanmathi,. In International Journal of Advanced Research in Computer and Communication Engineering
6. Jagtap Nilesh, Pawn Alai, Chavhan Swapnil and Bendre M.R.. "Voice Based System in Desktop and Mobile Devices for Blind People". In International Journal of Emerging Technology and Advanced Engineering (IJETAE)
7. Ummuhansifa U., Nizar Banu P K, "Voice Based Search Engine and Web page Reader". In International Journal of Computational Engineering Research (IJER).
8. G. Shoba, G. Anusha, V. Jeevitha, R. Shanmathi. "AN Interactive Email for Visually Impaired". In International Journal of Advanced Research in Computer and Communication Engineering.
9. Arnaud Ramey, Javier F. Gorostiza, Miguel A. Salichs, "A Social Robot as an Aloud Reader: Putting together Recognition and Synthesis of Voice and Gestures for HRI Experimentation" International conference on Human-Robot Interaction, March 2012.
10. Yu shao, chip-hong chang, "Bayesian Separation with Sparsity Promotion in Perceptual Wavelet Domain for Speech Enhancement and Hybrid Speech Recognition" Journal on systems, man, and cybernetics, volume 41, issue 2, March 2011.
11. Zhanyu Ma and Arne Leijon, "A Probabilistic Principal Component Analysis Based Hidden Markov Model for Audio-Visual Speech Recognition", Conference on computing & processing, Digital
12. Ramin Halavati, Saeed Bagheri shouraki and Saman Harati Zadeh, "Recognition of human speech phonemes using a novel fuzzy approach" , Journal applied to soft computing, Volume 7, Issue 3, June 2007
13. Dharani Perera, "Voice recognition technology for visual artists with disabilities in their upper limbs", conference on Computer Human Interaction, OZCHI '05, November 2005
14. Yang Liu, Elizabeth Shriberg, Andreas Stolcke , Dustin Hillard, Mari Ostendorf, Mary Harper, "Enriching Speech Recognition with Automatic Detection of Sentence Boundaries and Disfluencies" Journals and magazines, Volume 14, issue 5, September, 2006.