

Voice Based Email Service for Visually Impaired

*¹Vinutha H, ²Amutharaj Joyson, ³Mythri G, ⁴Seema K, ⁵Varsha V

^{1, 2, 3, 4 & 5}Department of Information Science and Engineering,
RajaRajeswari College of Engineering, Bengaluru, India.
¹vinuthamadhhusudhana@gmail.com,
²amutharaj@yahoo.com, ³mythri452@gmail.com,
⁴aithalseemak@gmail.com, ⁵varshavishal5476@gmail.com

Abstract

This paper introduces the voice based email system that can be utilized by visually impaired people to access E-mail smoothly. The objective of this work is to help the visually impaired people to send and receive voice based mails with the assistance of computer. This paper focuses on the advances on finding a new method that supports the visually impaired to get email by voice which is represented as text. This paper presents a voice to text and text to voice technique to access the email by visually impaired. This helps the visually impaired people to send the mail through voice without using any typing device. It uses Tkinter, Python libraries and IVR technique.

Keywords: IVR, voice to text convertor, text to voice convertor, Tkinter.

1. Introduction

At present the world is moving based on Internet. No task could be done with an absence of Internet. One of the fundamental fields that Internet has reformed is communication. Furthermore, talking about communication over Internet, the primary concern that comes in our brain is E-mail. In any case, there is a unique criterion for people to get to the Internet and the criteria is one should have the option to see. In any case, there are visually impaired individual or blind individual who can't notice objects and consequently can't see the computer display or typing device. It is extremely more uncertain that each time a visually challenged individual can discover somebody for help. Although for these explanations the visually challenged individuals are condemned in our public. Nowadays there are various advances available such as Automated Speech Recognition(ASR), Text to Speech and many more. Yet these are not excessively much productive for blind people. There are many people in the world who have low vision and furthermore individuals living with visual impairment. Right now, this paper has undertaken the idea which gives user an ability to send mail using voice orders without the need of keyboard typing or any visual things.

The user of this framework need not have to recollect any essential data about console. Straightforward click of a mouse tasks exist across the capacities making system simple to utilize the traditional emails. This system gives area of position where user be inciting by way of communication with the goal that user will not have any restrictions and need not to stress over recollecting the click of a mouse activity where individuals needs to accomplish. The navigation framework utilizes TTS (Text-to-Speech) for visual impairment to give navigation administration through voice. This research work utilizes voice reaction techniques; so that blind people may have the authority on their mail accounts utilizing their voice and have the option to read, transmit, and communicate to authorities for the various important assignments..

2. Related Work

Prince Bose et al [1] explained the mechanisms to use the Internet or any digital information by visually impaired depends on Braille displays and keyboard which are cost effective. Prince Bose et al [1] presented a voice controlled system which transmit and receive information in the form of audio. It helps the blind people to send mails, receive mails, weather forecast and make notes.

Chucal Yi et al. [2] presented a footage build additive printed work reading system to help blind individual. Here the blind people will shake the object to know Region Of Interest (ROI) to differentiate it from surrounding or background object in camera. In ROI based text localization there is a recognition that is conducted to acquire the text information. Here the email which will recognize output in voice form to the visually impaired people.

K Jayachandran and Anubumani [3] explained that audio feedback technologies such as screen readers which help the blind people to access over Internet applications easily but many number of visually impaired people in many countries particularly in India could not benefit much of these types of system due to difference of technology required for Indian language compared to other languages. This paper authorized the visually impaired individual to dispatch and collect email in their own speech with the support of mobile device. This technique uses voice to text and text to voice for blind people

Amritha Suresh et al. [4] stated that email is one of the important technologies but this technology cannot be used by visually impaired. This paper introduced an email system that can be used by visually impaired. This system makes use of voice recognition, Interactive Voice Response(IVR), mouse click operation and for security purpose this system make use of voice recognition for user verification.

Halimah B Z et al [5] proposed the Mail System (MS) that has the ability of access to Internet. By checking, sending and accepting email, looking in the Internet. This proposed mail system consists of five modules which was initially structured and promoted for the visually impaired people and the same can be utilized by different users and elderly people. Halimah B Z et al [5] tested the proposed mail system which showed positive outcomes.

N. Karthik et al. [6] proposed a semantic web index for the better utilization of information and carries data closer to the individual and make the service more active. The authors presented the voice empowered abstract based web device for blind individual. They presented a theoretical based web search tool. This pursuit gets the user question through voice and changes over them into text content with the assistance of programming. Generation of abstract text content is advancement in the cosmology rundown and produces the specific outcome utilizing semantic web. This showed content is changed over into voice.

S.L Hari Priya et al. [7] depicted the voice based email engineering which can be used by the visually impaired individuals for utilizing E-mail then interactive media works effectively and proficiently. It will assist with decreasing the psychological burden taken by the incognizant in regards memorizes then type characters utilizing the console. This paper presents a voice based email system which will support visually impaired people to send and receive mails easily. It uses artificial intelligence technology.

Email is efficiently employed by the users for sending and receiving of important information. This kind of transferring of message is difficult for visually impaired. In previous work, blind people don't send mail using the system because this sort of mail doesn't seem to be preferable for visually impaired as they can't send the mail. Audio based emails are well preferred for blind people. So the visually impaired person can easily respond to the audio instructions. This type of system is very rare. So there is less chance to available this speech based email to blind. This research work not only focuses on visually impaired people but also common users.

3. Design and Implementation of Voice based E-Mail Services

The newly developed system provides easy accessibility of emails for visually challenged. This can be efficiently used by any person such as common or blind person. The system is based on Google gTTS API speech to words and words to speech conversion. The technique can be used by visually challenged person and the complete system is based on conversion of written text into speech which helps the blind person to listen the audio based emails and enables conversion of text into speech through which blind can send speech message and that message is converted into text. Python libraries and the functions are used in implementation the voice based email service extended for the visually impaired persons.

A. Speech to Text Conversion Technique

Speech recognition library for recognizing speech from audio source like microphone then recognized speech will be stored in file then converting into write mode and the read in binary mode here we are using application/octet stream is a binary file. Then set the entire is payload to payload means set payload () used to change the payload to encoded form. Then attach the file in the mail. Send the message as string. Statlts() is used for secure message sending to the recipient inbox..

B. Text to Speech Conversion Technique

The required content is converted to voice audio by gTTS and saved in mp3 file and then mail is sent. This system helps the visually impaired by providing audio based e-mails for easy to understand and access the email for communication. Before sending the e-mail, this voice based email service framework has to enable the visually impaired person's data entry task of typing the e-mail id, password, and body of mail through the specially designed human computer interface. This interface is developed by using python library functions.

3.1 Sequence Diagram for Voice Based E-mail service for Visually Impaired

Sequence diagram of Voice based Email service is shown in figure 1.

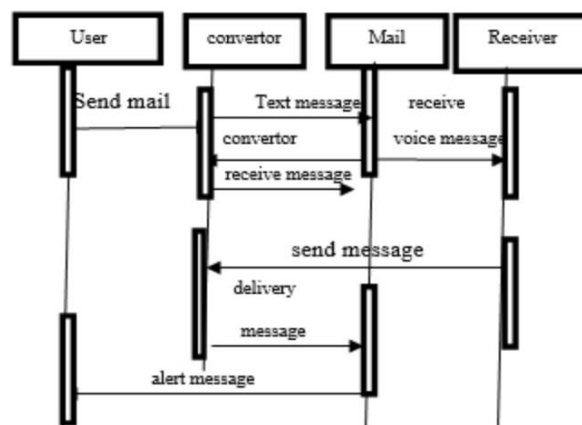


Figure 1: Sequence diagram of Voice based E-mail

Whenever the normal person or normal sender sends the email as the text message and stored in the inbox of the visually impaired recipient. Text email message will be converted into voice message and deliver to visually impaired recipient. Similarly visually impaired persons will send voice message that will be converted into text message and deliver to user. Whenever mail delivers to the user there will be a alert message to the user.

3.2. Speech Recognition and Speech to Text Translation

The proposed voice based email service application recognizes voice audio with an assistance of device like microphone. This application takes speech through a microphone and processed speech will be stored in a file. This conversion can be carried out with the assistance of Google speech recognition. The recognized text should be stored in a file.

GTTS (Google Text To Speech) is a python library which translates text into voice audio .voice which will be saved in mp3 file, a file like object used as audio manipulation, Text to speech convertor accepts any number of character text as input. Speech processor does not have any limit and that speak out any text message provided as an input. Text to speech conversion procedure is depicted in Figure 2.

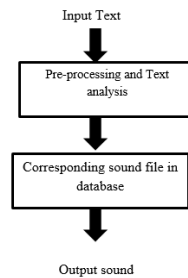


Figure 2: Flowchart of Text to Speech

Interactive Voice Response (IVR) provides the interconnection between the person and system through voice. These systems will answer the taped hearing and help user. It is implemented based on libraries of python. Tkinter is a GUI library for python. It is the simplest way to make GUI application which can be used to display buttons within the application.

3.3 Multipurpose Internet Mail Extension (MIME):

MIME Base is the base class for all the MIME specific subclasses. MIME text () method is used support and convert text into characters as well as audio. MIME multipart is used to send single or multiple text and non-text attachments.

4. Discussion and Features of Voice Based Email Service

A Registration and login Page

Primary part of the system is the registration page. The system can be used by any user should first register by their own username and password. The second part of the system is login page. When the user completes the registration page the person can login to the system.

B. Compose Mail

Compose mail is the most important attribute of the mailing systems. The normal sender can send the message. It is an attachment file (text only) message. Subject and body of the message is written in code itself and blind person can send mail using microphone.

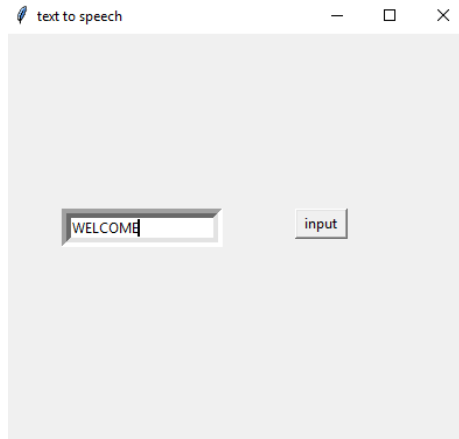


Figure 3: Compose Page

C. Inbox

When the visually impaired sender sends an e-mail, it is stored in an Inbox. This helps the user/recipient to access the email that is sent by the normal sender. The visually impaired recipient can hear the voice message sent by normal sender using mp3 file. This is depicted in Figure 4.

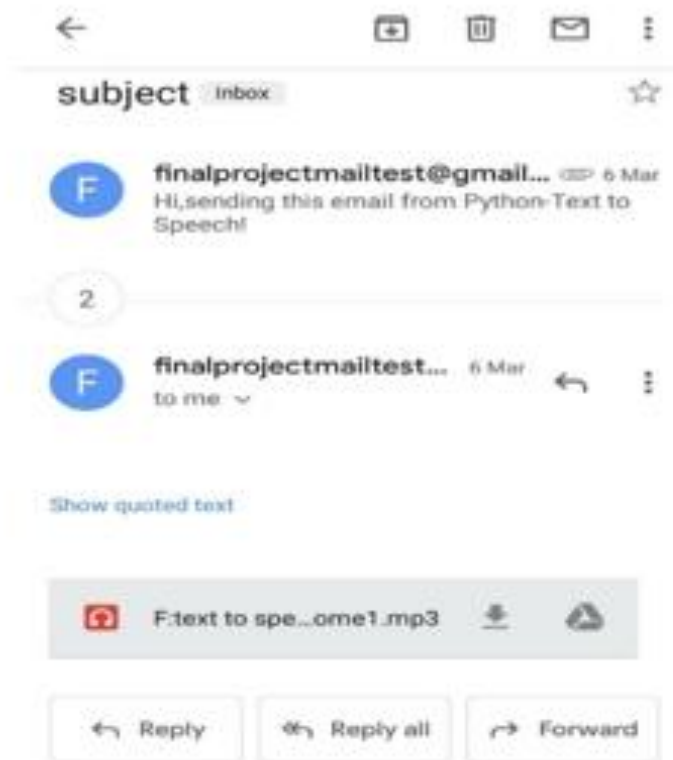


Figure 4: Receiving Voice based Email

6. Conclusion

This paper presented the simple email system which can be used by visually impaired people. This mail system is better than the normal e-mail system by voice recognition.

There is a python library that converts voice to text and text to voice. This will reduce the burden of the visually impaired person's cognitive load to remember the information and procedures and character typing work using the keyboard. This helps the visually impaired people to put a step forward in an effective manner to achieve their wants.

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Authors



Vinutha H received her Bachelor of Engineering degree from VTU University, Belgaum, India in 2010 and Master of Technology degree from VTU University, Belgaum India in 2016. She is currently working as an Asst. Professor in the Department of Information Science and Engineering, RajaRajeswari College of Engineering, Bangalore, India. She has 9.6 years of experience in teaching. Her research interests include Image Processing, Data mining, Internet of Things, Network security.



Amutharaj Joyson received his Bachelor of Engineering degree from Manonmaniam Sundaranar University, Tirunelveli, India in 1999 and Master of Engineering degree from Madurai Kamaraj University, Madurai in 2002, and Ph.D. from Anna University, Chennai, India in 2012. He is currently working as a Professor and Head in the Department of Information Science and Engineering, RajaRajeswari College of Engineering, Bangalore, India. His research interests include the Internet of Things, Healthcare Applications, Network security, Cellular Automata, and Cloud Computing. Dr. Amutharaj Joyson is a reviewer of the International Journal of Network and Computer Applications (JNCA), Computer and Communication, Elsevier Publications. He has served as a Technical Programme Committee member and reviewer at various Conferences including the IEEE International Conference on Electrical, Electronics, Communication, Computer Technologies & Optimization Techniques (ICEECCOT-2018), IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS-'19). He is a Fellow of the Institution of Engineers (IE), Kolkata, India, Fellow of Institution of Electronics and Telecommunication Engineers, New Delhi, a lifetime member of the Computer Society of India (CSI), Mumbai and a life member of ISTE, New Delhi.



Mythri G completed her Bachelor of Engineering Information Science and Engineering from Visvesvaraya Technological University, Belagavi in 2020. She has undergone industry Internship at Livewire in 2019. She is one of the organizing committee members of International Women's Day Celebration on 8th March 2019 organized by Rajarajeswari Groups of institutions, Bangalore. It is recorded in the Limca Book of Records for the largest human image of Karnataka map in 2 colours, most women taking Oath on women Empowerment and Most women displaying messages on Women Empowerment.



Seema K completed her Bachelor of Engineering Information Science and Engineering from Visveswaraya Technological University, Belagavi in 2020. She has undergone industry Internship at Live wire in 2019. She is one of the organizing committee members of International Women's Day Celebration on 8th March 2019 organized by Rajarajeswari Groups of institutions, Bangalore. It is recorded in the Limca Book of Records for the largest human image of Karnataka map in 2 colours, most women taking Oath on women Empowerment and Most women displaying messages on Women Empowerment.



Varsha V completed her Bachelor of Engineering Information Science and Engineering from Visveswaraya Technological University, Belagavi in 2020. She has undergone industry Internship at Livewire in 2019. She is one of the organizing committee members of International Women's Day Celebration on 8th March 2019 organized by Rajarajeswari Groups of institutions, Bangalore. It is recorded in the Limca Book of Records for the largest human image of Karnataka map in 2 colours, most women taking Oath on women Empowerment and Most women displaying messages on Women Empowerment.