

Voice Based Email for Visually Impaired

Abhinav Verma, Adarsh Kumar Mishra, Jaya, V a i b h a v i S r i v a s t a v

Department of Computer Science, NIET Gr. Noida , AKTU, India

I. ABSTRACT

Out of all the available communication tools, email is still the most popular one in the corporate sector. However, because all computer-based tasks depend on visual perception, all of these technologies are useless to those who are blind or visually handicapped. Given that there are an estimated 285 million visually impaired persons in the globe, it is imperative to make online communication tools usable to them as well. This study tries to create

an email system that makes it simple for them to utilise. The system uses mouse click events, interactive voice response (IVR), and speech recognition.

The technology uses voice recognition to verify users as an additional layer of protection.

IVR, MFCC, text-to-speech, speech-to-text conversion, dynamic time

II. INTRODUCTION

The usage of email is still expanding globally at a steady rate. Nearly 2.6 billion people used email in the world in 2015. Over 2.9 billion people will be email subscribers worldwide by the end of 2019. It has been observed that by the end of 2019 more than half of population will be using email. One of the main limitations is that reading emails or, generally speaking, any website on the internet requires visual talents.

This renders the technology useless because a person who is visually impaired cannot in any manner utilise the services offered by the internet

The visually impaired were made slightly more comfortable by the then-current technologies, such as screen readers, automatic speech recognizers, speech-to-text, and text-to-speech, but only to a limited extent. For a person who is blind, a voice-based email system with these technology alone presents privacy and security issues. In order to send and receive emails securely and privately, it was necessary to develop a full voice-based programme.

Therefore, we developed this voice-based email system for the blind, which enables those with visual impairments

to Utilize email services with ease. The user's security is provided by this system's incorporation of speaker

verification at sign-in, which is the most important factor we are taking into consideration as we develop it.

The location of the keys and the use of keyboard shortcuts are not necessary knowledge for users of this system. Our system's user-friendliness is greatly enhanced by the fact that all functions rely just on straightforward mouse click actions.

II. LITERATURE REVIEW

2.1 Blind people's voice-based system in desktop and mobile devices. Journal of Emerging Technology and Advanced Engineering (IJETA), 2014 The topic of this essay is "Voice Based System in Desktop and Mobile Devices for Blind People."

Blind persons can access e-mail and other multimedia features of the operating system thanks to voice mail design (songs, text). SMS messages can also be read by the system itself in mobile applications. The development of computer technology has given visually challenged persons worldwide new opportunities today. It is worth nothing that India has more than 60% of all blind people in the world. This paper describes the voice mail architecture used by blind persons to quickly and easily utilise the operating system's multimedia and email features. In addition, this architecture will reduce the mental effort required for visually impaired people to remember and enter keyboard characters.

There is a ose who are blind or visually impaired. This covers the creation of screen readers, screen magnifiers, and text-to-Braille systems. Recently, efforts have been made to create tools and technology that will make it easier for blind persons to use internet-based technologies. For the Blind People, early attempts included speech input and input for surfing. The web page on IBM's home page has an intuitive user interface and converts text to speech with various gender voices for

reading texts and links. The developer must create a complicated new interface for the screen reader to recognise in order to navigate the intricately designed graphical web pages, which is a drawback. Simple web page division into two dimensions for easier surfing. This drastically streamlines the structure of a web page and makes it simpler to browse. A tree structure was created from the HTML page by another web browser 6 by examining the links. It did not turn out to be particularly effective for surfing despite its attempts to organise the sites that are linked together to improve navigability. After then, it failed to address requirements for the present page's navigability and usability. eGuideDog was a different browser created for those who are blind or visually impaired, and it included a TTS engine. To depict the page in a user-friendly way, this system uses a sophisticated text extraction technique. The conditions for commercial use were still not met, though. When it comes to the Indian context, the two web browser frameworks that Blind people use to access the internet, including emails, are ShrutiDrishti and WebBrowser for Blind. ASR and TTS systems for the Indian language are integrated into both systems. However, cell phones and other tiny devices cannot be used with the currently available systems.

2.2“Voice Based Search Engine and Web page Reader”. This article, which will appear in the International Journal of Computational Engineering Research (IJCER), attempts to create a search engine that only allows voice-based human-machine interaction. An innovative voice-based search engine and web page reader is shown that enables users to command and manage the web browser using their voice. The current search engines receive text requests from users, respond by retrieving the necessary documents from servers, and present the results as text. Even though the current web browsers can play audio and video files, the user must first request it by entering some text in the search text box. Then, using Graphical User Interfaces, the user can play the audio or video they are interested in. The voice-based search engine that is being suggested aims to assist users, particularly the blind, in using the Internet. When a user speaks to a computer, the machine will answer by speaking back to them. The user will also receive help from the computer while reading the documents. For the "Social Robot Maggie," a voice-enabled interface with additional support for gesture-based input and output methodologies is turning it into an audible 7 reader. The

voice pitch, speed, volume, and other factors can have an impact on the voice recognition and synthesis. The Loquendo ETTS (Emotional Text-To-Speech) programme serves as its foundation. Robots can also use gesticulation based on managerial principles to convey their mood. By eliminating noise, speech recognition accuracy can be increased. In In a proposed iterative speech enhancement technique, the speech and noise components are separated using a Bayesian approach in a wavelet domain. To take use of the chosen features in the representation of the time frequency space, the suggested method is created in the wavelet domain. These include noise level estimation and signal level discrimination. For the visual modality of audio-visual recordings, Principle Component Analysis (PCA) based HMM is employed. Primary Component Analysis (PCA) and PDF (Probabilistic Density Analysis). presents a method for voice recognition that ignores noise rather than detecting and removing it, using fuzzy modelling and decision-making. Instead of using exact acoustic information, the speech spectrogram is transformed into a fuzzy linguistic representation. In order to help virtual artists with upper limb limitations create visual cuts in a digital medium while maintaining the uniqueness and authenticity of the art piece, voice recognition technology is integrated with facial feature interaction. techniques to recover structural features such sentence boundaries, filler words, and disfluencies In order to enhance the output of speech recognition, metadata are explored in and describe the method that automatically adds details about the locations of sentence boundaries and voice disfluencies. On the international space station, Clarissa, a voice-activated process browser, is currently operational (ISS). The voice recognition module, a classifier for making the open microphone accepts/rejects decision, a semantic analysis, and a conversation manager are the core elements of the Clarissa system. mostly concentrates on expressions An end pitch and a delta pitch for each syllable are predicted from a set of textual variables to create a prosody model for each expressive state. Such paralinguistic events effectively provide hints as to the state of a transaction in a TTS system, and Markup defining 8 these events is a straightforward way for a developer to accomplish these types of events in the audio coming from the TTS engine. The main properties of are that it can produce speech that sounds smooth and natural, that the voice characteristics may be altered, and that it is "trainable. High quality vocoder and hidden semi-Markov model based acoustic modelling have been used to address the limitations of the fundamental system, which is that

synthesised speech is "buzz" because it is based on a vocoding technique. Concatenation Synthesis, Articulation Synthesis, and Formant Synthesis are the three types of speech synthesis. primarily focuses on formant synthesis; input is an array of phonemes for syllables along with formants' frequencies; frequency of this input is processed; in collaboration with Thai-Tonal-Accent Rules, formants' frequencies are converted to waves, which are then output as audio via soundcard.

IV. METHODOLOGY

1. Existing System

For those who are blind, the mail services that are now offered are useless. This is due to the fact that these technologies are completely useless to them because they are unable to give aural feedback to read out the contents for them. It is challenging for them to carry out specific actions, such clicking a mouse, because they are unable to see the objects on the screen.

While text can be used, they all have some issue. Essentially, the screen reader reads the text on the screen to them and they have to use the keyboard to respond. Therefore, people who have never used a computer will not be able to use this system.

2. Proposed System

email using voice commands. The user will be asked to voice the message and transmit it in compose. By clicking the button given by the prompt in the inbox, the user can listen to the emails they want to. The user must follow the instructions in the command to switch between emails to access the sent messages.

The user will be prompted to enter information about the recipient and the mail's subject when the control falls on a specific piece of mail. Deleted emails from the inbox or sent emails may be found in the trash. The user can utilise this option to retrieve any deleted emails they may have at any moment.

V. DESIGN

1 User Interface Design

Java script and HTML are both used in the creation of the user interface. Since the system is primarily designed for blind individuals, for whom the appearance and feel won't be as important as the efficiency of understanding the prompting, the entire website focuses more on

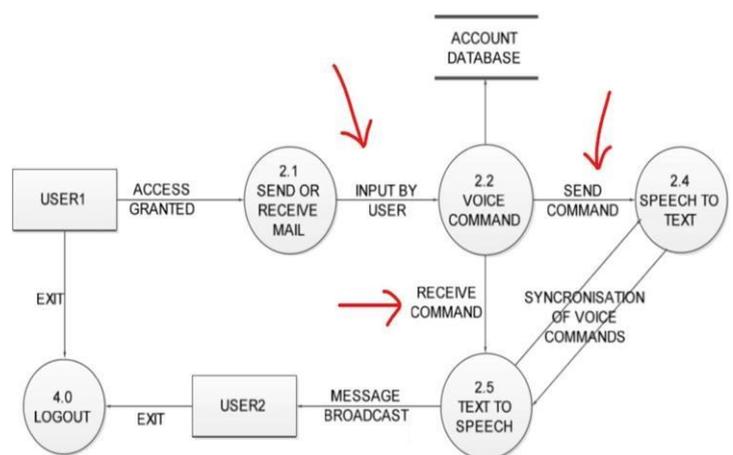
efficiency in understanding the voice recognition than the look and feel of the system.

2 Database Design

Our system keeps a database for storing user emails and validating user identities. There are five tables altogether. All emails from the corresponding service that belong to that particular user will be stored in the Inbox and Sent-Mail schemas.

3 System Design

The focus of our system is on voice. The user will hear voice messages where they are right now when they have gone beyond all of the website's legal boundaries. It can be disabled if regular folks don't want it. The system work flow is defined in



VI. FUTURE SCOPE

Sending emails is not difficult for people with eyesight, but it is a big problem for those who are not, because it involves many responsibilities.

The voicebased email system has many uses, including helping visually impaired people understand their surroundings. For example, if the cursor moves to an icon on the page, such as record, the "record button" sound will play. Screen readers everywhere. However, the user must remember the mouse click. Instead, these objects will mitigate this problem, as mouse pointers will show exactly where they are. This approach relies more on accessibility for all users, including normal people, the visually impaired, and the illiterate.

VII. ACKNOWLEDGEMENT

Our teachers and parents, who showed a genuine interest in our project work and gave us advice on how to make it better, deserve our sincere gratitude. They constantly go out of their way to inspire and support us in finishing this project effectively. In order to complete this project, we

would want to thank everyone who has helped us.

VIII. CONCLUSION

The primary motivation behind creating the method described in the study was to make it simpler for persons who are blind to utilise email, which is currently the most common form of communication. As the mail system relies on verbal abilities, it will assist visually challenged people in conquering all small challenges.

This will lessen the cognitive strain on the user from having to learn keyboard shortcuts, as well as the software load of employing screen readers and automatic speech recognition. Through IVR, the system will direct the user as to what action needs to be taken in order to attain desired results, making it much more user-friendly. The technology being built presently will only function on desktop computers. There is potential to integrate this facility as an application in mobile phones since their use is now on the rise. To make the system more safe, security elements that are introduced during the login process can also be changed.

IX. REFERENCES

[1]. Jagtap Nilesh, Pawan 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 (IJETA), 2014 on Pages 404-407 (Volume 4, issue 2).

[2]. Ummuhanyisa U., Nizar Banu P K , “Voice Based Search Engine and Web page Reader”. In International Journal of Computational Engineering Research (IJCER). Pages 1-5

[3]. Hailpern J., Reid L.G., Boardman R., “DTorial: An interactive tutorial framework for blind users in a Web 2.0 World”

[4]. Ender Tekin, James Coughlan – “A Mobile Phone Application Enabling Visually Impaired Users to Find and Read Product Barcodes”, July 2010, Page-290- 295.

[5]. Rastogi R., Mittal S., Aggarwal S., CSE Dept., ABES Engineering College – “A novel approach for communication among blind, deaf and dumb people”, November 2018, 2015 IEEE.

[6]. Wagner S.(Halle). Intralinguas speech-to-text-conversion in real time Challenges and Opportunities. MuTra 2005 – Challenges of Multidimensional Translation: Conference Proceedings SAMUEL THOM.

[7]

[Http://www.ijceronline.com/papers/special%20issue/a0105.pdf](http://www.ijceronline.com/papers/special%20issue/a0105.pdf)

[8] Arjun aj, “voice based email for blinds”, slide share [http://www.slideshare.net/123arjun1 /voice based-ema](http://www.slideshare.net/123arjun1/voice-based-ema)