

Voice Based E-Mail System for Visually Impaired using Hidden Markov Models

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Abstract: *The paper aims to develop a voice-based email system utilizing Hidden Markov Models (HMMs) for speech recognition. In an era where multitasking and hands-free interaction are paramount, this system offers a convenient and intuitive way for users to manage their emails through natural spoken commands. Leveraging a diverse dataset of voice recordings and corresponding text transcripts, HMMs are trained to recognize various email related commands such as composing new emails, reading inbox contents, replying to messages, and more.*

Keywords: Voice recognition, Speech-to-text, voice commands

I. INTRODUCTION

In today's fast-paced digital age, efficient communication is paramount, with email serving as a cornerstone of professional and personal correspondence. However, traditional email interfaces often present barriers to accessibility and productivity, particularly in situations where hands-free operation is necessary or preferred, such as while driving or multitasking. To address these challenges, we present an innovative project focused on revolutionizing email sharing through voice-based interaction. Leveraging advanced speech recognition technology, our system offers users a seamless and intuitive means of sharing emails using natural spoken commands. Whether composing new messages, forwarding existing emails, or replying to threads, users can effortlessly manage their email communications without the need for manual input. With a robust architecture built on Hidden Markov Models (HMMs), our system ensures accurate and reliable recognition of spoken commands, even in noisy or dynamic environments. Furthermore, by integrating seamlessly with popular email services and supporting real-time updates and notifications, our project empowers users to stay connected and productive on the go. Through meticulous training on diverse voice datasets and continuous refinement, our system aims to deliver a user-friendly and efficient solution that enhances accessibility and productivity in email sharing scenarios. With a commitment to innovation and usability, our project sets out to redefine how we interact with and share email communications in today's interconnected world.

Developed system seamlessly integrates with existing email services, allowing users to perform email-related tasks effortlessly using voice commands alone. Through its intuitive interface and hands-free functionality, our system seeks to enhance user productivity and accessibility, bridging the gap between natural language interaction and email management.

II. LITERATURE SURVEY

[1] Tirthankar Dasgupta, "Voice Mail Architecture in Desktop and Mobile Devices for the Blind People", 2012.

The advancement in computer based accessible systems has opened up many avenues for the visually impaired across a wide majority of the globe. Audio feedback based virtual environment like, the screen readers have helped Blind people to access internet applications immensely. However, a large section of visually impaired people in different countries in particular, the Indian sub-continent could not benefit much from such systems. In this paper, we describe the Voice Mail system architecture that can be used by a Blind person to access e-Mails easily and efficiently.

[2] Ummuhanysifa U., “Voice Based Search Engine and Web Page Reader”, 2013.

This paper aims to develop a search engine which supports Man-Machine interaction purely in the form of voice. A novel Voice based Search Engine and Web-page Reader which allows the users to command and control the web browser through their voice, is introduced. The existing Search Engines get request from the user in the form of text and respond by retrieving the relevant documents from the server and displays in the form of text.

[3] Tharani K. K., “Voice Based Mail Attachment For Visually Challenged People”, 2017. Internet has become one of the basic amenities for day-to-day living. Every human being is widely accessing the knowledge and information through internet. However, blind people face difficulties in accessing these text materials, also in using any service provided through internet. The advancement in computer based accessible systems has opened up many avenues for the visually impaired across the globe in a wide way.

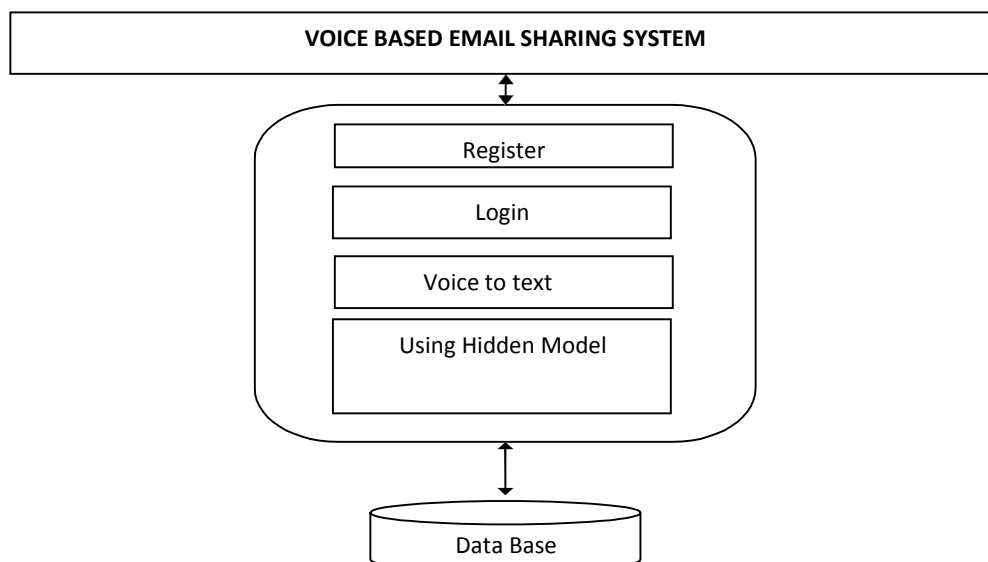
[4] D. Kiran Kumar, “User Interface for Visually Impaired People”

The research work deals with the design and implementation of Speech recognition device using Raspberry Pi for essential usage to visually impaired people. Now a day's blind people are increasing enormously so, the main objective of the research is to provide a simple, cheap, friendly user, and compact device for visually impaired people to use multimedia applications of operating system like text, music player and dialing system by interfacing GSM module. All the above are implemented in a low cost Raspberry Pi board. Thus a goal of producing a compact device has been designed at low cost using offline speech recognition.

[5] “Voice Based System in Desktop and Mobile Devices for Blind People”, 2014.

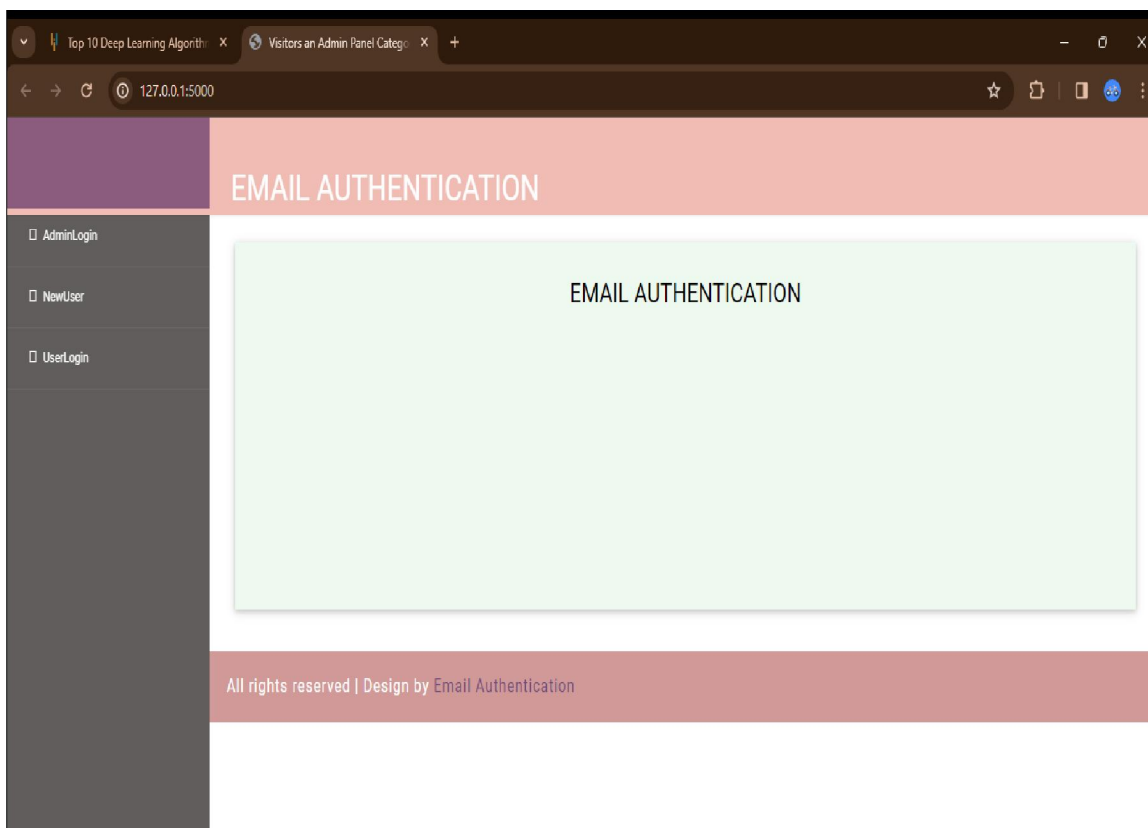
Today in the information age computer has become an integral part of every body's life. We use a computer to hear songs, read something, accessing information from the internet. We use computer everywhere. But the information access and computer handling has to be done with the mouse and keyboard and by reading all the things present on the screen and then deciding what to do making it a visual process means we need eye sight to handle the information on the computer i.e. if we want to read news from the internet we have to first open a browser and then open a website to read news and then follow the links to read specific news.

III. METHODOLOGY

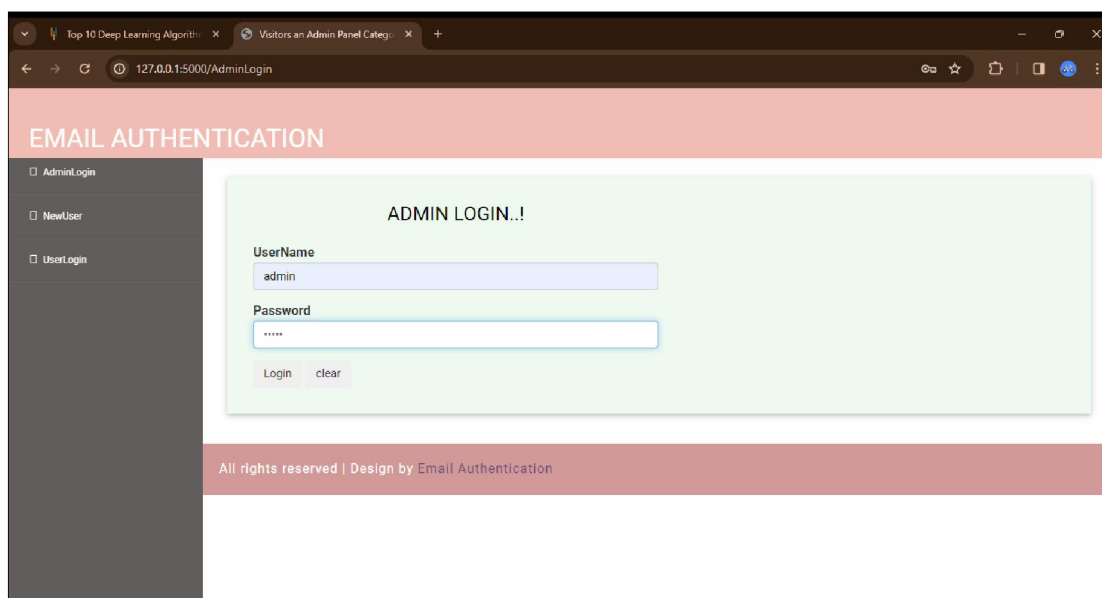


IV. OUTPUT SCREENS

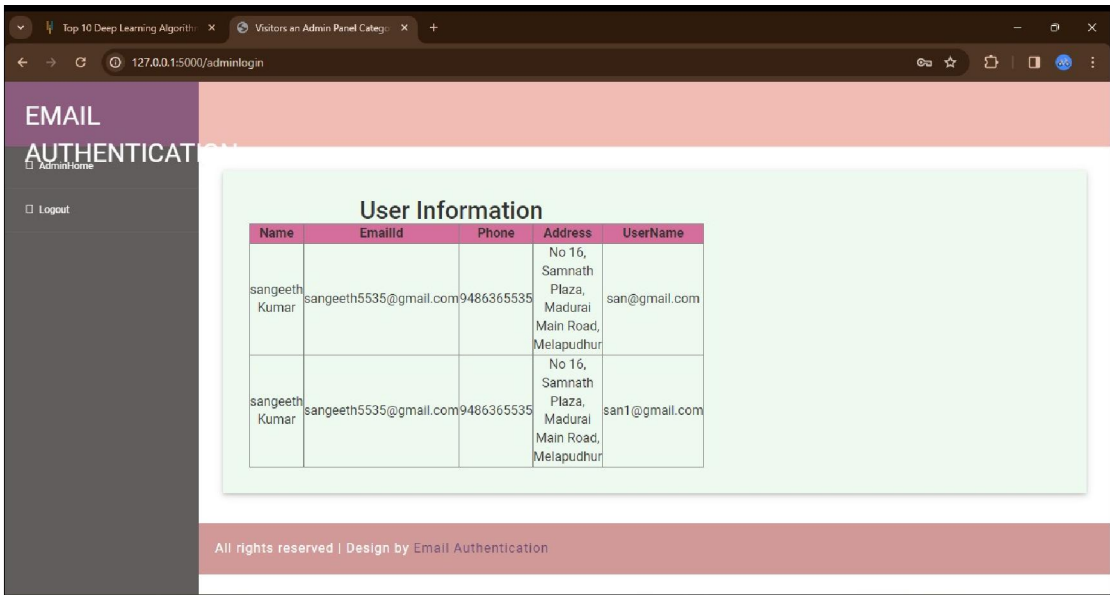
HOME PAGE



ADMIN LOG IN PAGE



USER INFORMATION

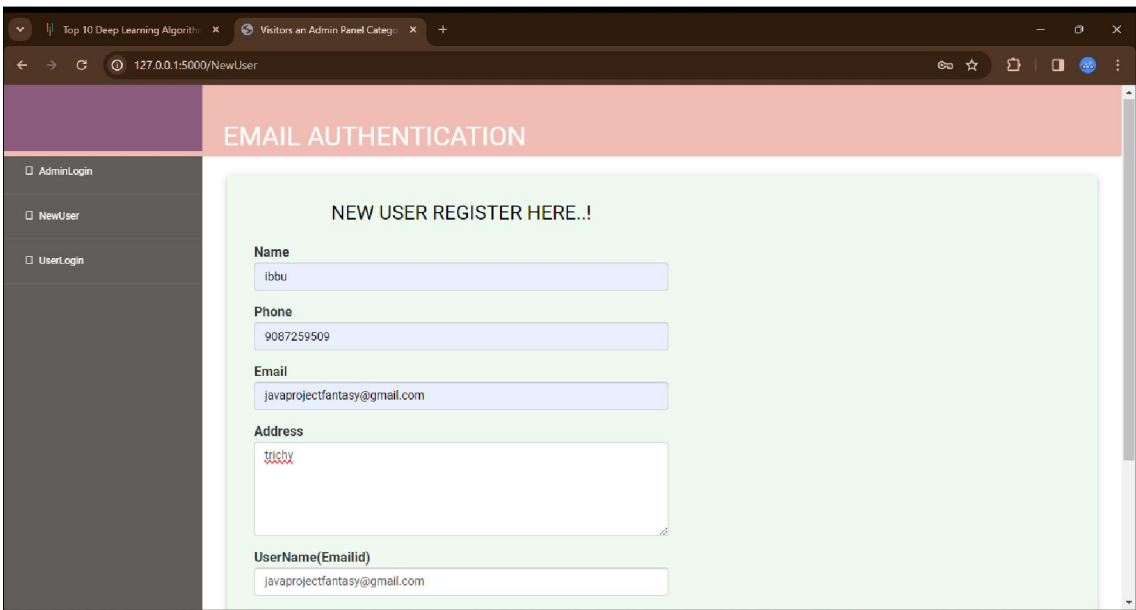


The screenshot shows a web browser window with the URL `127.0.0.1:5000/adminlogin`. The page has a sidebar with 'AdminHome' and 'Logout' links. The main content area is titled 'User Information' and contains a table with the following data:

Name	EmailId	Phone	Address	UserName
sangeeth Kumar	sangeeth5535@gmail.com	9486365535	No 16, Samnath Plaza, Madurai Main Road, Melapudhur	san@gmail.com
sangeeth Kumar	sangeeth5535@gmail.com	9486365535	No 16, Samnath Plaza, Madurai Main Road, Melapudhur	san1@gmail.com

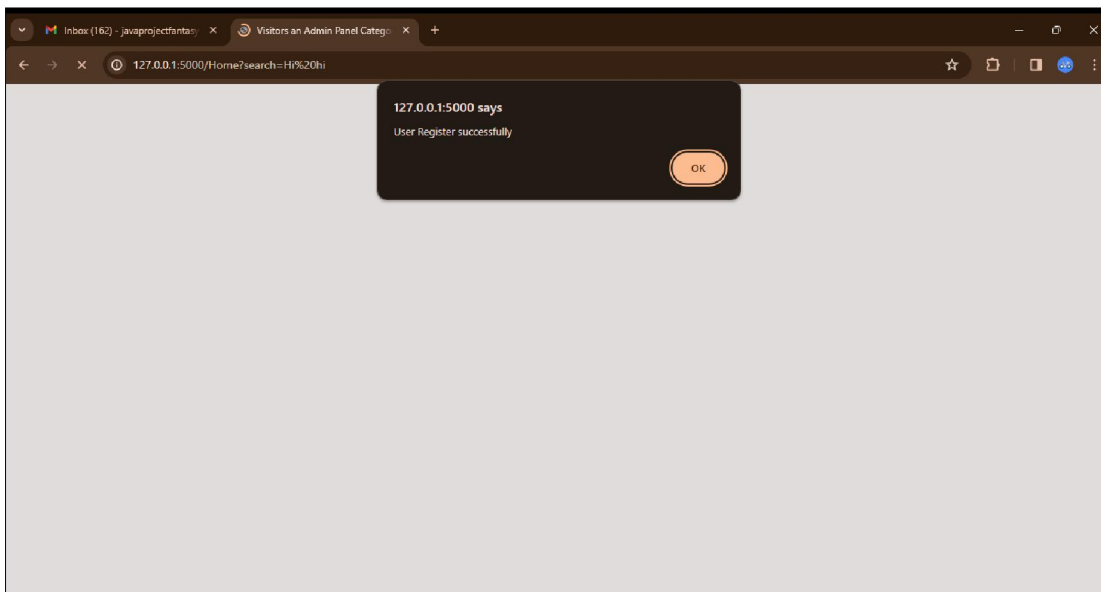
At the bottom of the page, it says 'All rights reserved | Design by Email Authentication'.

NEW USER REGISTRATION

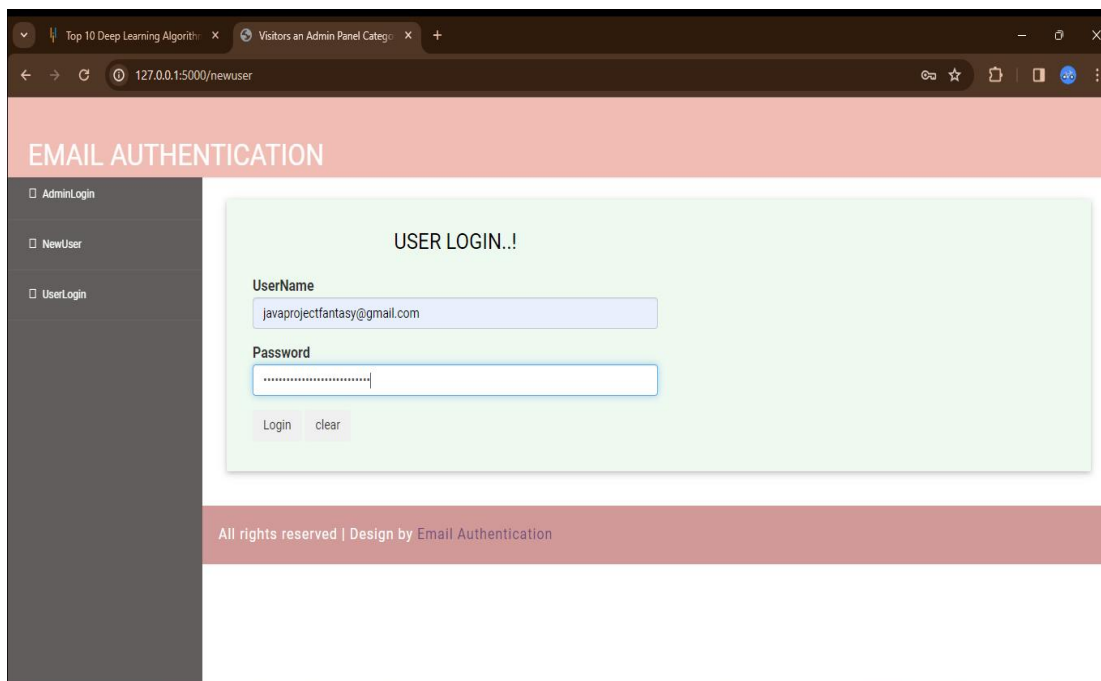


The screenshot shows a web browser window with the URL `127.0.0.1:5000/NewUser`. The page has a sidebar with 'AdminLogin', 'NewUser', and 'UserLogin' links. The main content area is titled 'NEW USER REGISTER HERE..!' and contains a form with the following fields:

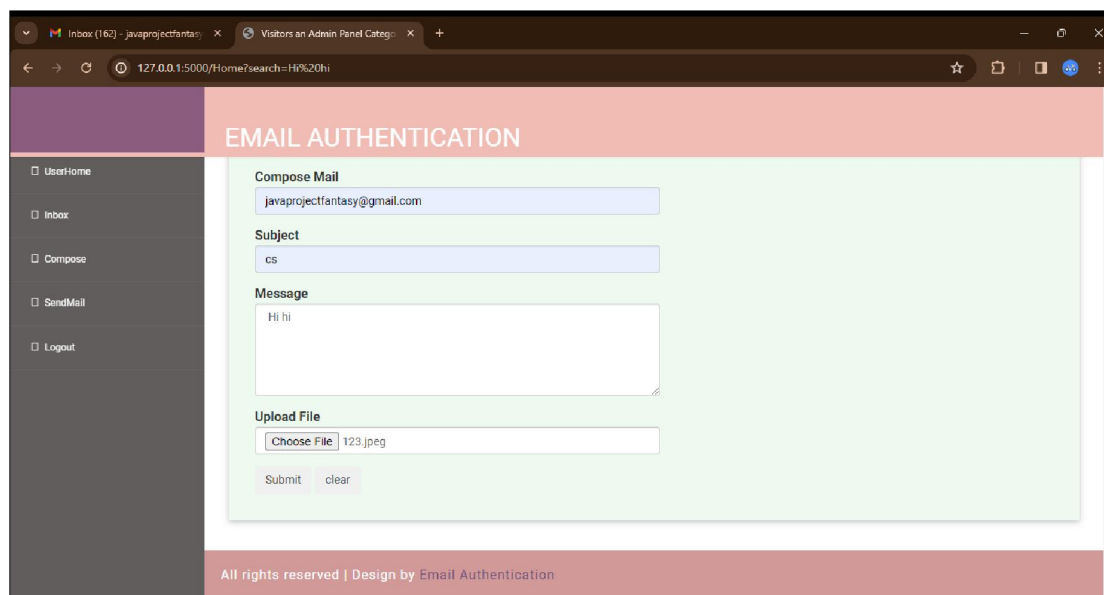
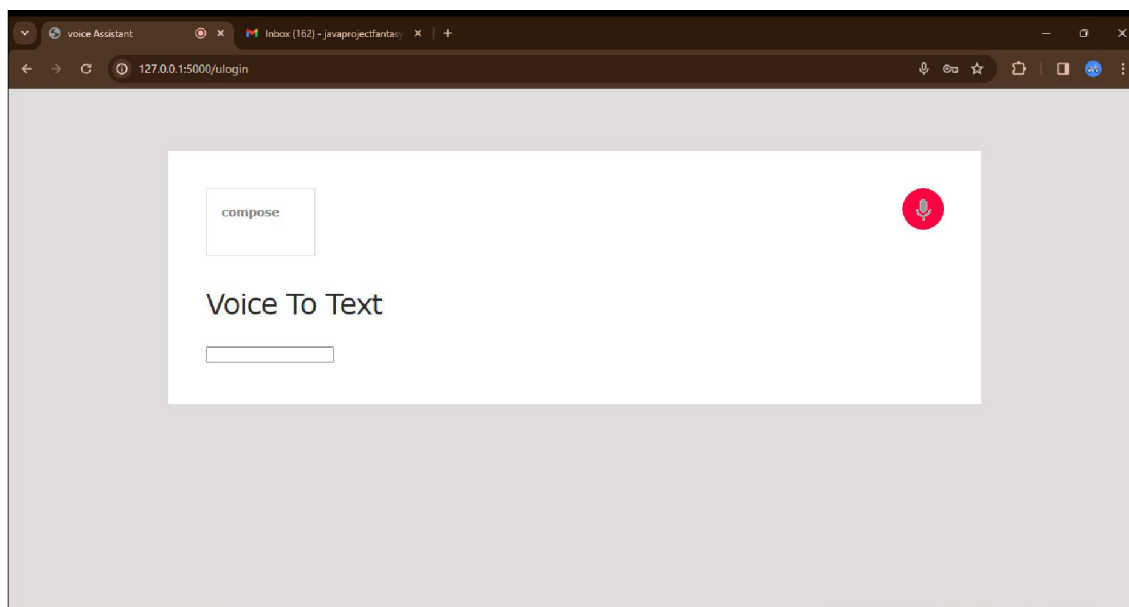
- Name:**
- Phone:**
- Email:**
- Address:**
- UserName(EmailId):**



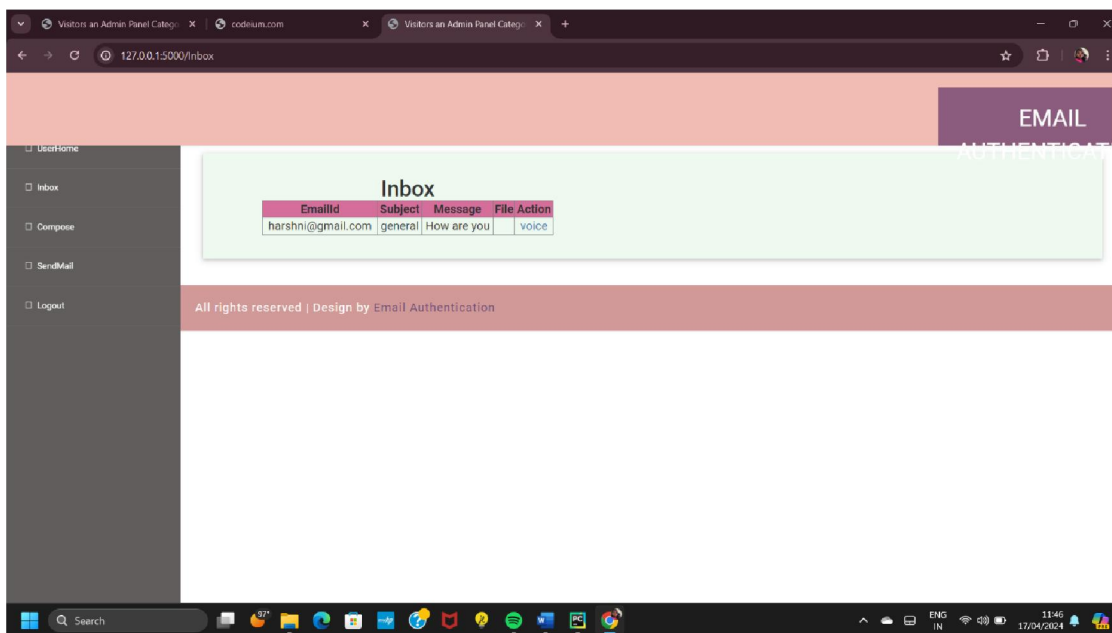
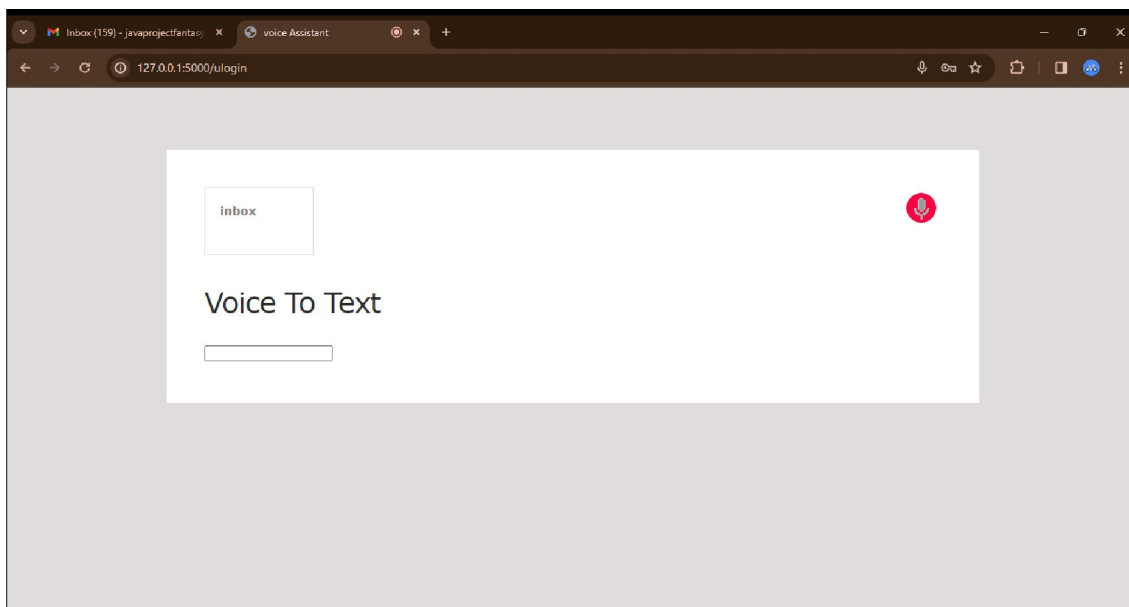
USERLOG IN



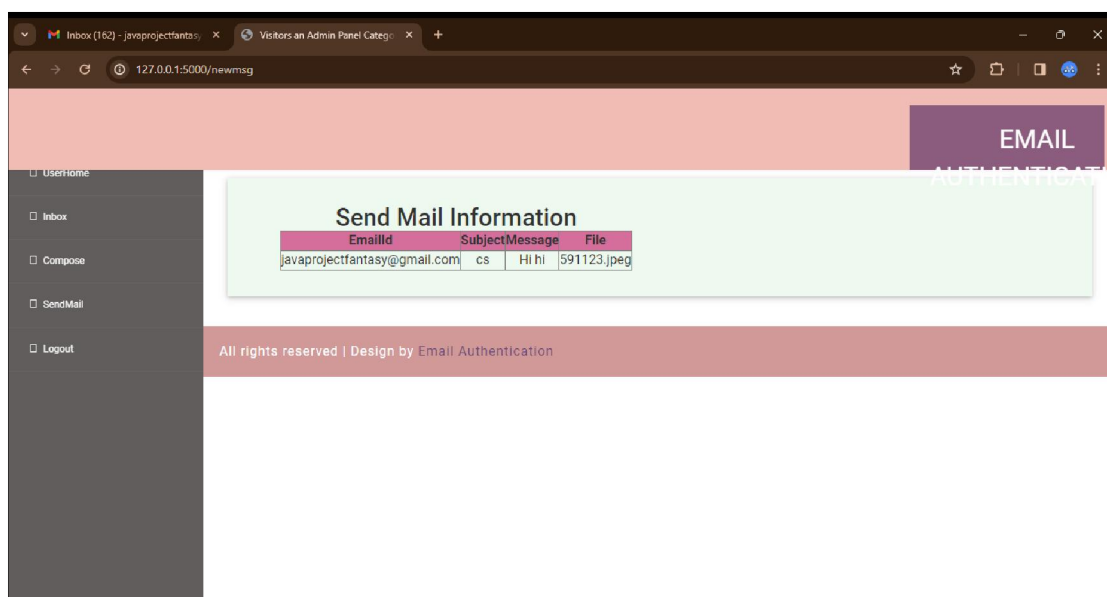
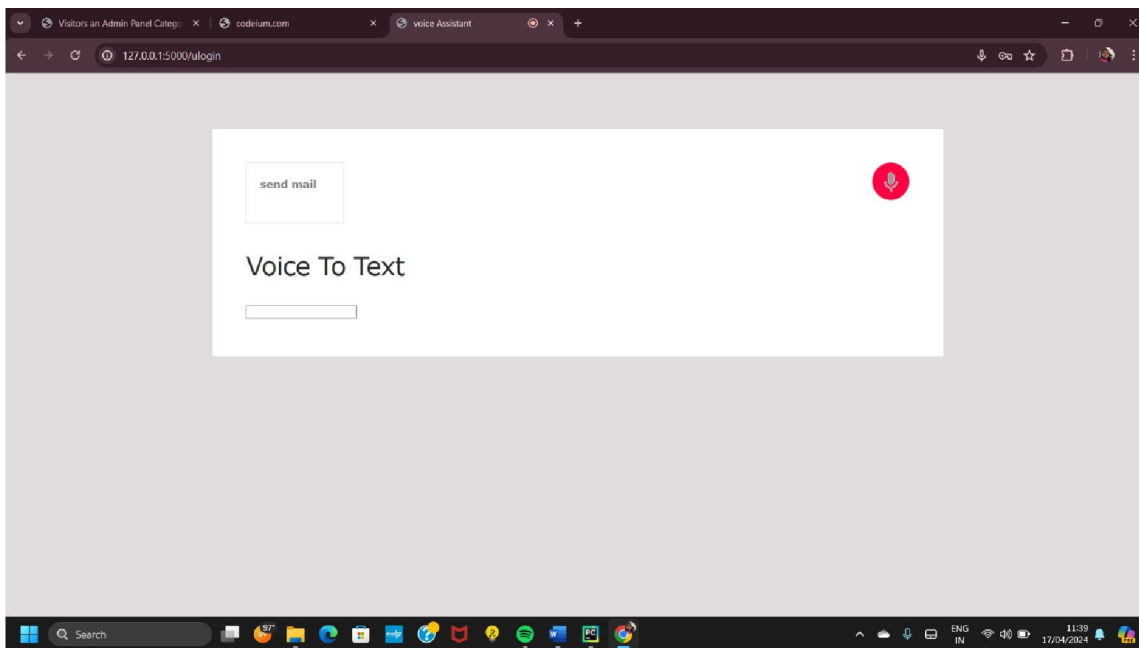
USING VOICE TO OPEN COMPOSE MENU



USING VOICE TO OPEN INBOX MENU



USING VOICE TO OPEN SEND MAIL MENU



V. CONCLUSION

In conclusion, the voice-based email sharing system utilizing Hidden Markov Models (HMMs) offers a novel and efficient approach to email management, enhancing accessibility and productivity in real-time access scenarios. By leveraging HMMs for speech recognition, the system enables users to interact with their email accounts seamlessly using natural spoken commands, eliminating the need for manual input and enabling hands-free operation. The integration of HMMs into key modules such as login credential verification and voice-to-text conversion ensures accurate and reliable recognition of user commands, enhancing the overall user experience. Moreover, the system's framework facilitates secure authentication, email sharing functionalities, and real-time updates, providing users with a comprehensive and user-friendly email management solution

REFERENCES

- [1]. Heinold, Brian. "A practical introduction to Python programming." (2021).
- [2]. Kneusel, Ronald T. Practical deep learning: A Python-based introduction. No Starch Press, 2021.
- [3]. Dhruv, Akshit J., Reema Patel, and Nishant Doshi. "Python: the most advanced programming language for computer science applications." Science and Technology Publications, Lda (2021): 292-299.
- [4]. Sundnes, Joakim. Introduction to scientific programming with Python. Springer Nature, 2020.
- [5]. Hill, Christian. Learning scientific programming with Python. Cambridge University Press, 2020.
- [6]. JagtapNilesh, Pawn Alai, ChavhanSwapnil and BendreM.R., "Voice Based System in Desktop and Mobile Devices for Blind People" , In International Journal of Emerging Technology and AdvancedEngineering (IJETAE),
- [7]. 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.
- [8]. <https://medium.com/javarevisited/10-free-python-tutorials-and-courses-from-google-microsoft-and-coursera-for-beginners-96b9ad20b4e6>
- [9]. <https://www.bestcolleges.com/bootcamps/guides/learn-python-free/>
- [10]. <https://www.programiz.com/python-programming>
- [11]. <https://realpython.com>
- [12]. <https://www.codecademy.com/learn/learn-python>