



Web App to enable communication among Visually impaired and everyone else.

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Abstract: In this fast-paced world, managing your personal and professional lives can be really hectic. And not only this but communication plays a vital role in your day-to-day life. Since without communication you cannot do half of your daily work. But Now days, we can see that many people cannot communicate with each other due to some problems or some issues, like if a Deaf and a Blind person wants to communicate with each other than how can they do that it becomes really difficult for them to communicate, and it's not only about deaf and blind but also if someone cannot talk on phone, he prefers texting and while the other person prefers talking. So, we create an application to help Deaf and Blind people to communicate and they can also show or hear their emotions and what exactly they are trying to explain and hence it will remove the barrier of communication between them. For such times where everything is just a click away, this functions as an application that helps its users to identify their emotions and also to communicate with each other. This project helps users to communicate who have problem in texting/ Calling and also it helps the deaf and blind people in communication. The application would include processing on Device depending on the range of the application. It also allows the users to witness emotions with the help of emoji, since we have used multiclass in our project. This application saves the time that we spend on unimportant trivialities and aims to communicate between deaf and Blind people. This Project provides a better way for the people with Hearing impairment to visually read text converted by the visually impaired voice.

Keywords— visually impaired, web app, communication, deaf, emoji.

I. INTRODUCTION

In this fast-paced world, managing your personal and professional lives can be really hectic. And not only this but communication plays a vital role in your day to day life. Since without communication you cannot do half of your daily work. But Now days, we can see that many people cannot communicate with each other due to some problems or some issues, Like if a Deaf and a Blind person wants to communicate with each other than how can they do that it becomes really difficult for them to communicate, and it's not only about deaf and blind but also if someone cannot talk on phone he prefers texting and while the other person prefers talking. So, we create an application to help Deaf and Blind people to communicate and they can also show or hear their emotions and what exactly they are trying to explain and hence it will remove the barrier of communication between them. For such times where everything is just a click away, This functions as an application that helps its users to identify their emotions and also to communicate with each other. This project helps users to communicate who have problem in texting/ Calling and also it helps the deaf and blind people in communication. The application would include processing on Device depending on the range of the application. It also allows the users to witness emotions with the help of emoji's, since we have used multiclass in our project. This application saves the time that we spend on unimportant trivialities and aims to communicate between deaf and Blind people. This Project provides a better way for the people with Hearing impairment to visually read text converted by the visually impaired voice. We intend to develop an application were you have option to use speech mode or text mode and according to that you can communicate with anyone according to what you desire to communicate. If you click on speech mode you just have to talk and it gets converted into text and it is sent to the person who wishes to text you rather than call. It works vice versa.

Our main objective is to make more life easy for the people with Hearing impairment to visually read text converted by the visually impaired voice. This functions as an application that helps its users to identify their emotions and also to communicate with each other. This project helps users to communicate who have problem in texting/ Calling and also it helps the deaf and blind people in communication. The application would include processing on device depending on the range of the application. NLP began in the 1950s as the intersection of artificial intelligence and linguistics. NLP was originally distinct from text information retrieval (IR), which employs highly scalable statistics-based techniques to index and search large volumes of text efficiently: Manning *et al* provide an excellent introduction to IR^[3]. There is rising interest in vector-space word embeddings and their use in NLP, especially given recent methods for their fast estimation at very large scale.^[4]

II. LITERATURE REVIEW

The literature on web apps for visually impaired individuals and communication highlights the need for accessible technology that caters to the specific needs of this population. Several studies have explored the challenges faced by visually impaired individuals in communication and the potential benefits of web apps in overcoming these challenges.

One study by Cui et al. (2018) emphasized the importance of accessibility and usability in developing web-based technologies for visually impaired individuals. The study identified several barriers to communication, including limited access to technology, lack of accessible interfaces, and difficulties in navigating online content. The authors highlighted the need for inclusive design principles to ensure that web apps are accessible to all individuals, regardless of their abilities.

Another study by Akhtaruzzaman et al. (2020) examined the potential benefits of using web apps to enhance communication among visually impaired individuals. The study identified several key features that can improve accessibility and usability, such as text-to-speech capabilities, voice recognition, and haptic feedback. The authors concluded that web apps can provide visually impaired individuals with a means to communicate more effectively and independently, thereby enhancing their quality of life.

A third study by Silva et al. (2019) investigated the challenges faced by visually impaired individuals in using social media platforms for communication. The study identified several barriers, including inaccessible interfaces, lack of descriptive text, and difficulty in accessing visual content. The authors suggested that web apps with accessible interfaces and assistive technologies can facilitate communication among visually impaired individuals, providing them with greater opportunities for social interaction.

Overall, the literature highlights the importance of developing web apps that are accessible, usable, and tailored to the specific needs of visually impaired individuals. By leveraging technology and inclusive design principles, we can create web apps that enable communication among visually impaired individuals and everyone else, promoting social inclusion, independence, and accessibility.

III. MOTIVATION

In modern civilized societies for communication between human speeches is one of the common methods. Therefore, to remove the barrier between blind and deaf people, so that even they can communicate in a better and a faster way, it's not only about deaf and blind but also if someone cannot talk on phone, he prefers texting and while the other person prefers talking. The motivation for developing a web app to enable communication among visually impaired individuals and everyone else is driven by several factors:

1. **Accessibility:** One of the primary reasons for developing this web app is to make communication more accessible for visually impaired individuals. People who are visually impaired often face difficulties communicating with others due to the lack of accessible communication tools. A web app that is specifically designed to accommodate the needs of visually impaired individuals can greatly enhance their communication abilities.
2. **Social Inclusion:** Communication is a vital aspect of social inclusion. Visually impaired individuals may feel isolated and excluded from society due to the difficulties they face in communicating with others. A web app that enables them to communicate with everyone else can help bridge this gap and facilitate social inclusion.
3. **Independence:** A web app that enables visually impaired individuals to communicate independently can greatly improve their quality of life. It can help them overcome the challenges they face in their daily lives and provide them with a greater sense of autonomy.
4. **Innovation:** Developing a web app that caters to the needs of visually impaired individuals is a novel and innovative idea. It can potentially revolutionize the way we think about accessibility and open up new avenues for research and development.

In summary, the development of a web app that enables communication among visually impaired individuals and everyone else is driven by the need to improve accessibility, promote social inclusion, enhance independence, and foster innovation.

IV. METHOD

The After the text edit has been completed, the paper is ready The Web Speech API, which provides a JavaScript interface for speech analysis and speech synthesis to web applications.

Word2Vec is a group of models which helps derive relations between a word and its contextual words. Let's look at two important models inside Word2Vec: Skip-grams and CBOW In Skip-gram model, we take a **center** word and a window of **context (neighbor)** words and we try to predict context words out to some window size for each center word. So, our model is going to define a probability distribution i.e., probability of a word appearing in context given a center word and we are going to choose our vector representations to maximize the probability. In abstract terms, this is opposite of skip-gram. In CBOW, we try to predict center word by summing vectors of surrounding words. This was about converting words into vectors. But where does the "learning" happen? Essentially, we begin with small random initialization of word vectors. Our predictive model learns the vectors by minimizing the loss function. In Word2vec, this happens with a feed-forward neural network and optimization techniques such as stochastic gradient descent. There are also count-based models which make a co-occurrence count matrix of words in our corpus; we have a large matrix with each row for the "words" and columns for the "context". The number of "contexts" is of course large, since it is essentially combinatorial in size. To overcome this size issue, we apply SVD to the matrix. This reduces the dimensions of the matrix retaining maximum information. In summary, converting words into vectors, which deep learning algorithms can ingest and process, helps to formulate a much better understanding of natural language. Sentiment analysis (also referred to as subjectivity analysis or opinion mining or emotion artificial intelligence) is a natural language processing (NLP) technique that identifies important patterns of information and features from a large text corpus. It analyzes thought, attitude, views, opinions, beliefs, comments, requests, questions, and preferences expressed by an author based on emotion rather than a reason in the form of text towards entities like services, issues, individuals, products, events, topics, organizations, and their attributes. Sentiment also has several unique properties that set it apart from other qualities that we may want to track in text. Often, we want to categorize text by topic, which may involve dealing with whole taxonomies of topics Sentiment classification, on the other hand, usually deals with two classes (positive vs. negative), arrange of polarity (e.g., star ratings for movies), or even a range in strength of opinion (Pang and Lee, 2008). These classes span many topics and users and kinds of documents. Although dealing with only a few classes may seem like an easier task than standard text analysis, it couldn't be further from the truth^[1] One way to reduce the amount of typing while programming is to use speech recognition.

Speech interfaces may help to reduce the onset of RSI among computer programmers, and at the same time, increase access for those already suffering motor impairments. Many disabled programmers are already bootstrapping voice recognition into existing programming environments.^[2]

V. ALGORITHM

Signup

select mode

if mode = handsfree

log in to the visual disabled mode

if mode = text only

log in to text mode

create rooms

log in via mongo DB

Chat application (input message)

start

use sockets.io for live messages

emo=NLPMethod(message) save message + Emotion to DB

end

NLPMethod(message)

start

parse message

use Model to predict Emotion return emotion

end

VI. OUTPUT



Fig.1 Sign Up Page

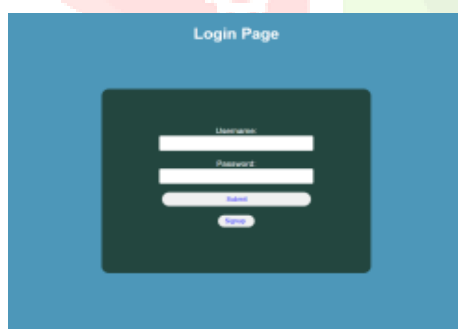


Fig.2 Login Page

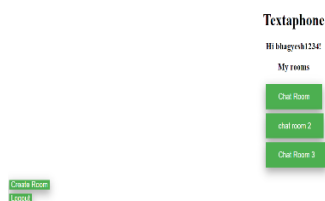


Fig.3 Chat Room

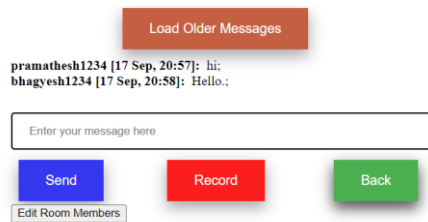


Fig.4 Message Room

VII. CONCLUSION

In this research that we are proposing, we have eased the process of communication among the deaf and blind. This application functions on the transfer learning algorithm for speech translation. We have implemented TensorFlow 2.0 for the development of our application. Furthermore, along with speech translation we have implemented multi-class classification for feedback of emotions using emojis. Thus the primary purpose of this project is to simplify the communication among the impaired. In the future we would like to make the application of our project even more so feasible and sustainable for the respective users by the implementation of Image Captioning, GUI, Speech Denoising and Translation from one language to another. In conclusion, the development of a web app that enables communication among visually impaired individuals and everyone else is a crucial step towards promoting accessibility, social inclusion, and independence. This web app can provide visually impaired individuals with a means to communicate with others, overcome the challenges they face, and participate more fully in society. By leveraging technology and innovation, we can create new opportunities for research and development in the field of accessibility. Ultimately, the development of this web app has the potential to revolutionize the way we think about accessibility and promote greater inclusion for all individuals, regardless of their abilities. Therefore, it is essential to continue investing in the development of such technologies to ensure that we create a more inclusive and equitable society for all.

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