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AUDIO TO SIGN LANGUAGE TRANSLATOR

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Abstract:
The prevalence of deafness in India is fairly significant. It is the second most common cause of disability. Approximately 63 million people in India suffer from significant auditory loss. There is a need for a medium to make communications between a normal person and a deaf person faster and convenient. Sign language is a universal way of communication for challenged people with speaking and hearing limitations. Multiple mediums are accessible to translate or to acknowledge sign language and convert them to text. However, the text to signing conversion systems has been rarely developed; this is often thanks to the scarcity of any sign language dictionary. This project is based on converting the audio signals to text using speech to text API. Speech to text conversion comprises of small, medium and large vocabulary conversions. Such systems process or accept the voice which then gets converted to their respective text. Then related signs(GIF's) are displayed
KEYWORDS: Speech to Text API, Deep Learning, DNN , Converter, Auditory disability, Sign Language, GIF's.

I INTRODUCTION

It is based on converting the audio signals received to text using speech to text API. Speech to text conversion comprises of small, medium and large vocabulary conversions. Such systems process or accept the voice which then gets converted to their respective text. Text to sign language conversion is mainly focused on communication between ordinary people and ordinary people and deaf-mute people. Sign language paves the way for deaf-mute people to
Communicate. Sign language is a visual language that is used by deaf and dumb as their mother tongue. It is figure out about 240 sign language have exist for spoken language in the world. Sign language is a type of language that uses hand movements, facial expressions and body language to communicate. It is used by the people who are deaf and people who can hear but cannot speak

II LITERATURE SURVEY

1) Speech to Sign Language Interpreter System (SSLIS):

The deaf and hearing-impaired make up a sizable community with specific needs that operators and technology have only recently begun to target. There is no such freely available software, let alone a single one with a reasonable price to translate uttered speech into sign language in real time. In this paper, this problem was tackled through presenting the "Speech to Sign Language Interpreter System (SSLIS)" to translate uttered English speech into video American Sign Language (ASL) in live mode. In addition to its main task, other interesting features were added to the SSLIS to make it even more comprehensive and beneficial. The Sphinx 3.5 was manipulated as the speech recognition engine for the SSLIS and for translation, ASL syntax was not followed, but rather the Signed English (SE) manual was employed as a manual parallel to English. Rule of operation, parameters optimization and accuracy measurements and snapshots of SSLIS are amongst the topics approached throughout this paper. We believe that SSLIS

would facilitate the acquisition of English as a second language for deaf people and help to fill the gap between deaf and nondeaf communities.

2) Speech to Sign Language Translator for Hearing Impaired:

The growth of the Internet has increased multi-folds in recent years. The Internet has become the medium of communication since the Covid-19 pandemic had started. The usage of communication via online means that the audio and visual content has also increased rapidly. Though it has been a boon for the major section of the people, differently-abled like the hearing-impaired people have limited resources to make use of. This project is aimed to design an application that converts the speech and text input into a sequence of sign language visuals. Speech recognition is used to convert the input audio to text and it is further translated into sign language. Natural Language Processing algorithms are used for word segmentation and extraction of root words. The translation happens to the Indian Sign Language in an effort to make this project more regional to the people of India.

3) Large vocabulary continuous speech recognition:

The context-independent deep belief network (DBN) hidden Markov model (HMM) hybrid architecture has recently

achieved promising results for phone recognition. In this work, we propose a context-dependent DBN-HMM system that dramatically outperforms strong Gaussian mixture model (GMM)-HMM baselines on a challenging, large vocabulary, spontaneous speech recognition dataset from the Bing mobile voice search task. Our system.

III EXISTING SYSTEM

Previous approaches were capable to recognize the speech and convert the input audio into text using Natural Language Processing algorithms.

• The existing systems focus on the translation by each letter in a word and translates to American Sign Language (ASL). It is difficult for the Indian deaf people to understand other countries sign language like American Sign Language(ASL), British Sign Language (BSL), New Zealand Sign Language, and many more.

Disadvantages of Existing System:-

1) Less accuracy in converting the text to related signs(GIF's).
2) low Efficiency.
3) More time is consumed in getting the output

IV PROBLEM STATEMENT

• It is very difficult for a normal person to interact with a deaf person, so to ease the situation we need a proper system.
• So, there is a need for a system that acts as a communication medium between normal and deaf people.
• The system must provide information and service to deaf people in sign language.

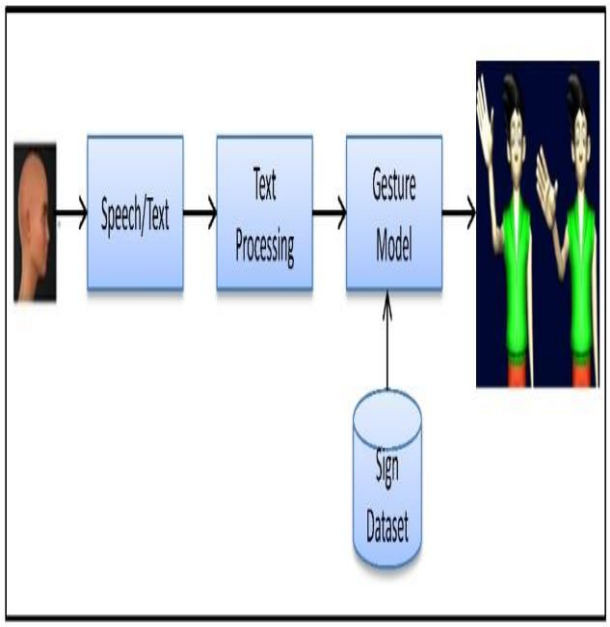
V PROPOSED SYSTEM

• Our proposed system is designed to overcome the troubles faced by the deaf people. This system is designed to translate each word that is received as input into sign language.
• Our system uses speech to text API to convert audio to text and deep learning algorithms like deep neural networks(DNN) to convert text to sign language with the related signs(GIF's).
• We use DNN algorithm which is helpful for converting the text to sign as we preload the dataset with text and signs as labels and it uses feature selection method which makes the identification of signs faster and accurate.
• In this system we are using two packages called Tensor flow and Keras.

4.1Advantages of proposed system:-

1) The functioning of the proposed system is fast.
2) With the help of DNN the identification of text related signs becomes easy and accurate

VI ARCHITECTURE



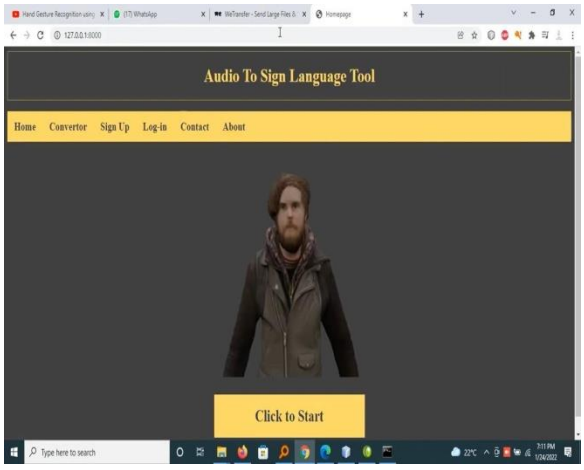
VII METHODOLOGY

Tensor layer was replaced with single sigmoid hidden layer by Hutchinson, Deng and Yu in the stacking networks. The performance was worst when the configuration in which only the bottom (first) layer was replaced with the DP layer. The performance was best and achieved more than 1% absolute reduction over the DNN when the configurations replaced the top hidden layer with the DP layer performs. This concludes the DP layers are suited to perform on binary features, consistent in findings from.

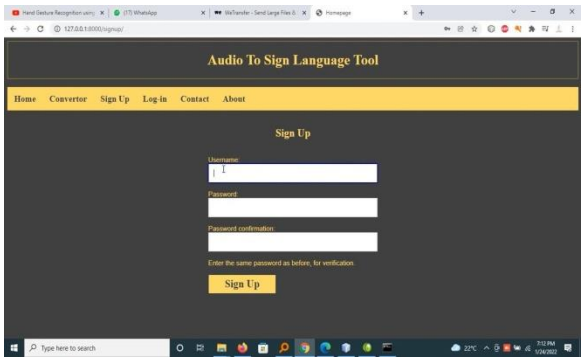
7.1 METRICS

On a voice search task and the Switchboard (SWB) phone-call transcription task it is found that CD-DNN-HMMs have achieved 16% and 33% relative recognition error reduction over strong, discriminatively trained CD- GMM-HMMs

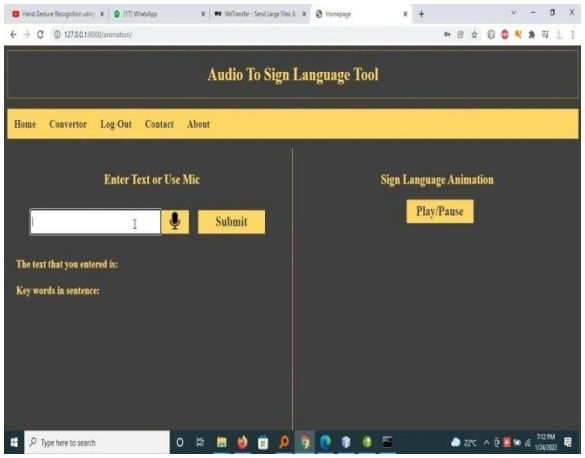
VIII RESULTS



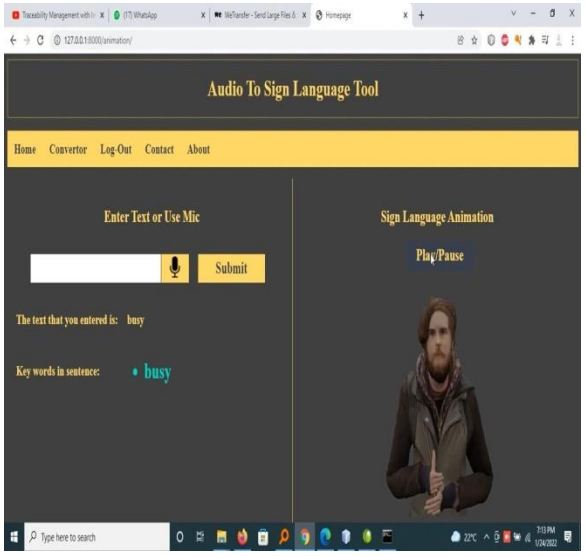
Home page



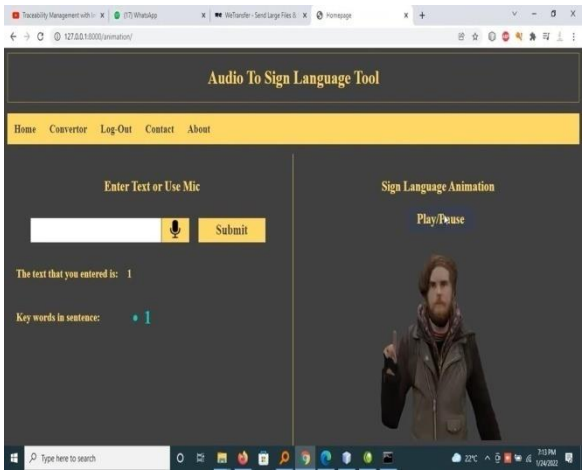
User registration



Converter



Test case 1



Test case 3

IX CONCLUSION

Sign language is one of the useful tools to ease the communication between the deaf and mute communities and normal society. Though sign language can be implemented to communicate, the target person must have an idea of the sign language which is not possible always. This was meant to be a prototype to check the feasibility of recognizing sign language. The normal people can communities with deaf or dumb using sign language and the text will be converted to sign images.

X FUTURE SCOPE

1. 1.Since deaf people are usually deprived of normal communication with other people, they have to rely on an interpreter or some visual communication. Now the interpreter can not be available always, so this project can help eliminate the dependency on the interpreter.
2. The system can be extended to incorporate the knowledge of facial expressions and body language too so that there is a complete understanding of the context and tone of the input speech.
3. A mobile and web based version of the application will increase the reach to more people.
4. Integrating hand gesture recognition system using computer vision for establishing 2-way communication system

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