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AUDIO TO SIGN LANGUAGE CONVERTER

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ABSTRACT

Communication plays a critical role for people and is regarded as a skill in life. Having this important aspect of life and surroundings in mind, we present our project article, which focuses primarily on supporting patients with pain or silent speech. Our research work leads to improved contact with the deaf and the mute.

Each sign language uses sign patterns visually conveyed to express the true meaning. The combination of hand gestures and/or motions of arm and body is called Sign language and the Dictionary. It is the combination of hands and facial expressions. Our project can understand signals in sign language. These symbols may be used to interact with hearing aids. Our article suggests a program that allows common people to interact effectively with others that are hard to understand.

In this case, we are implementing the Indian Sign Language (ISL) method by using a microphone and a camera. Translation of the voice into Indian sign language system by the ISL translation system is possible. The ISL translation framework uses a microphone to get pictures (From ordinary people) or continuous video clips, which the application interprets. Deaf people always miss out the fun that a normal person does, may it be communication, playing computer games, attending seminars or video conferences, etc. Communication is the most important difficulty they face with normal people and every normal person does not know the sign language.

The aim of our project is to develop a communication system for the deaf people. It converts the audio message into the sign language. This system takes audio as input, converts this audio recording message into text and displays the relevant Indian Sign Language images or GIFs which are predefined. By using this system, the communication between normal and deaf people gets easier.

Keywords: Natural Language Processing (NLP), Speech Recognition, Audio, Sign Language, Indian Sign Language (ISL).

I. INTRODUCTION

It is said that Sign language is the mother language of deaf people. This includes the combination of hand movements, arms or body and facial expressions. There are 135 types of sign languages all over the world. Some of them are American Sign Language (ASL), Indian Sign Language (ISL), British Sign Language (BSL), Australian Sign Language (Auslan) and many more.

We are using Indian Sign Language in this project. This system allows the deaf community to enjoy all sort of things that normal people do from daily interaction to accessing the information Sign language is communication language used by the deaf peoples using face, hands or eyes while using vocal tract.

Sign language recognizer tool is used for recognizing sign language of deaf and dumb people. Gesture recognition is an important topic since segmenting a foreground object from a cluttered background is a challenging problem. There is a difference when human looks at an image and a computer looking at an image. For Humans it is easier to find out what is in an image but not for a computer. It is because of this; computer vision problems remain a challenge. Sign language is a language that consists of signs made with hands and other movements, facial expression, and postures of body, which is primarily used by people who are deaf or hard hearing peoples that they can easily express their thoughts or can easily communicate with other people.

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II. METHODOLOGY

There have been many projects done on the sign languages that convert sign language as input to text or audio as output. But audio to sign language conversion systems have been rarely developed. It is useful to both normal and deaf people. In this project we introduce new technology that is audio to sign language converter using python. In this it takes audio as input, display the text on screen and finally it gives sign code/language of given input. All the words in the sentence are then checked against the words in the dataset containing videos and GIFs representing the words. If the words are not found, it splits the words into an individual letter and show the corresponding videos/clips which are predefined in the system. In this section we will discuss about our project.

DATA FLOW DIAGRAMS (DFD)

A data flow diagram (DFD) is a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement.

0 LEVEL DFD

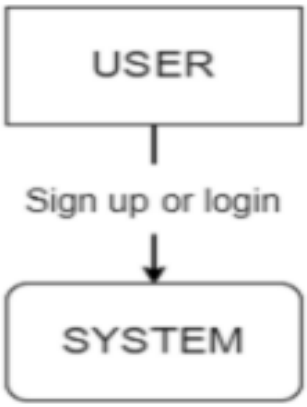

Fig. 1: Level 0 DFD

level-0 data flow diagram (DFD) is also known as the context diagram, shows a data system as a whole and emphasizes the way it interacts with external entities. A data flow diagram (DFD) illustrate how data is processed by a system in terms of inputs and outputs. Input going into a process are different from outputs leaving the process. Data stores are first shown at this level.

1 LEVEL DFD

First level DFD of Vehicle Number Plate Detection shows how the system is divided into subsystems each of which deals with one or more data flows to or from a user.

Level-1 DFD must balance with the Level 0 it describes. Input going into a process are different from outputs leaving the process. Continue to show data stores.

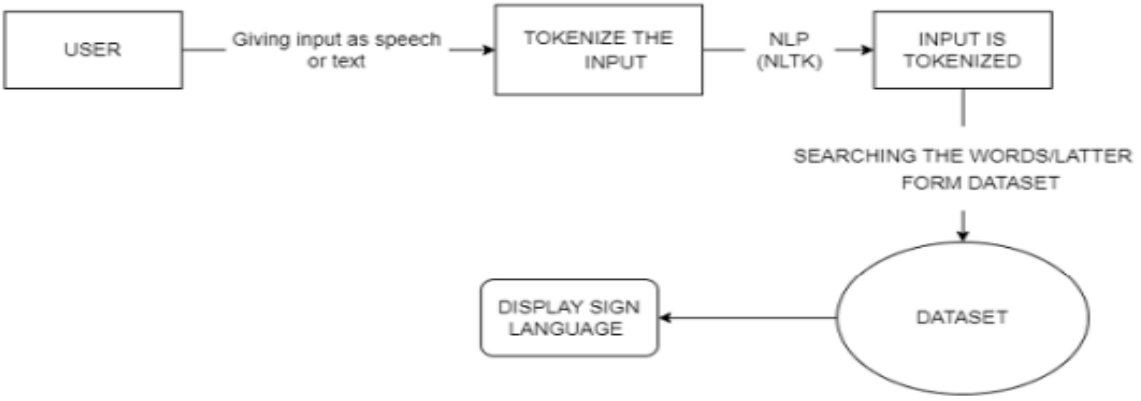

Fig. 2: Level 1 DFD

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III. MODELING AND ANALYSIS

Although sign language is used across the world to bridge the gap of communication for hearing or speech impaired which depend mostly on sign language for day-to-day communication, there are not efficient models that convert text to Indian sign language. There is a lack of proper and effective audio-visual support for oral communication.

While significant progress has already been made in computer recognition of sign languages of other countries, but a very limited work has been done in ISL computerization. Work done so far in this field has been much more focused on American sign language (ASL) or British sign language, but for Indian sign language, systems that have been developed are very few.

NLP: NLP language models are essential in applications that carry out a variety of functions. Additionally, NLP language models carry out tasks like speech recognition, sentiment analysis, audio to text conversion, and others to assist in analyzing the structure of human language and forecasting reactions. Additionally, NLP language models are crucial elements of contemporary NLP.

NLP is an AI method that makes it possible for machines and gadgets to understand and interpret human languages. It is also a development of concepts from machine learning, statistical modelling, and computational linguistics. Additionally, a few NLP advances have created new prospects for organizations and industries. Consequently, we shall discover the many NLP models in this post.

NLTK MODEL: The Natural Language Toolkit (NLTK) is a Python programming environment for creating applications for statistical natural language processing (NLP). For tokenization, parsing, classification, stemming, tagging, and semantic reasoning, it includes text processing libraries. Additionally, it comes with a cookbook and a book that describes the concepts underlying the language processing jobs that NLTK offers, as well as visual demos and sample data sets.

IV. RESULTS AND DISCUSSION

The main purpose of project is to take user input and convert it to sign language. Using natural language processing (NLP) are implemented to classify the text/speech into small part. Then searching words/later from database. At the end display the appropriate sign or gestures to the user. in this, problem we have considered that are:

1. Speech recognition & converting into text.
2. The whole statement converting into sign language.
3. No words are found in database/dataset.

Sign language is a language that uses manual communication methods such as facial expressions, hand gestures and bodily movements to convey information. This project makes use of videos for specific words combined to translate the text language into sign language. Speech impaired people use hand signs and gestures to communicate. Normal people face difficulty in understanding their language. Hence there is a need of a system which recognizes the different signs, gestures, and conveys the information to the deaf people from normal people. It bridges the gap between physically challenged people and normal people. Our approach provides the result in minimum time span with maximum precision and accuracy in comparison to other existing approaches.

According to 2011 census of India, there are 63 million people which sums up to 6.3% of the total population, who are suffering from hearing problems. Out of these people, 76-89% of the Indian hearing challenged people have no knowledge of language either signed, spoken, or written. The reason behind this low literacy rate is either the lack of sign language interpreters, unavailability of Indian Sign Language tool or lack of research on Indian sign language. Sign language is a natural way of communication for challenged people with speaking and hearing disabilities. There have been various mediums available to translate or to recognize sign language and convert them to text, but text to sign language conversion systems have been rarely developed, this is due to the scarcity of any sign language corpus. This is done by eliminating stop words from the reordered sentence. Stemming is applied to convert the words to their root form as Indian sign language does not support for

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inflections of the word. All words of the sentence are then checked against the words in the dictionary containing videos representing each of the words. If the words are not found in the dictionary, its corresponding synonym is used to replace it.

RESULT:

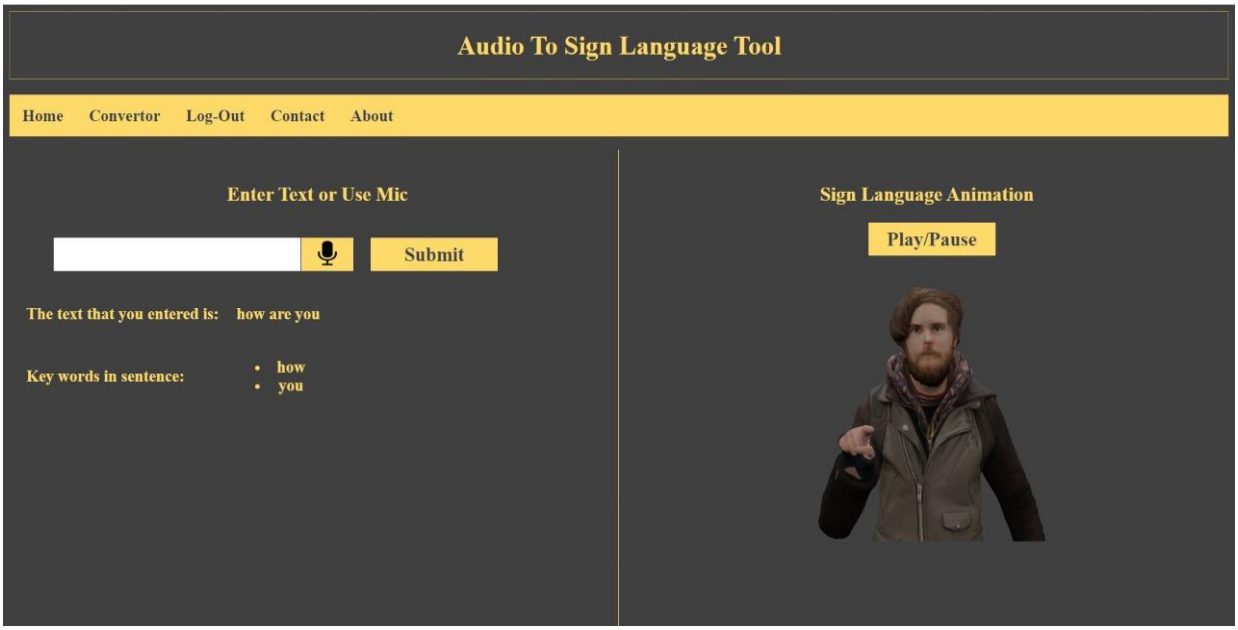

Fig. 3: Output

V. CONCLUSION

We propose to develop one for Indian sign language based on transfer-based translation. The success of this translation system will depend on the conversion of English text to Indian sign language bearing its lexical and syntactic knowledge. Our objective is to help people suffering from the problem of hearing.

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