SIGN LANGUAGE RECOGNITION USING MACHINE LEARNING

Ganesh Gaikwad*[1], Shreyash Meshram[*2], Miheer Jangale[*3], Devesh Mahajan[*4], Kunal Nevkar[*5]

[*1]Assistant professor, [*2,3,4,5]Student
Department of Computer Science and Engineering,
Sandip Polytechnic, Nashik, Maharashtra, India

***Abstract*: The aim of this project is to help the communication of two people, one hearing impaired and one without any hearing disabilities by converting speech to finger spelling and finger spelling to speech. Finger spelling is a subset of Sign Language, and uses finger signs to spell words of the spoken or written language. We aim to convert finger spelled words to speech and vice versa. Different spoken languages and sign language such as English will be considered. We propose design and initial implementation of a smart system which can automatically translates voice into text and text to sign language. Sign Language Translation Systems could significantly improve deaf lives especially in communications, exchange of information and employment of machine for translation conversations from one language to another has. Therefore, considering these points, it seems necessary to study the speech recognition. Usually, the voice recognition algorithms address three major challenges. The first is extracting feature form speech and the second is when limited sound gallery are available for recognition, and the final challenge is to improve speaker dependent to speaker independent voice recognition. Extracting feature form speech is an important stage in our method. Different procedures are available for extracting feature form speech. One of the commonest of which used in speech recognition systems is Mel-Frequency Cepstral Coefficients (MFCCs). The algorithm starts with preprocessing and signal conditioning. Next extracting feature form speech using Cepstral coefficients will be done. Then the result of this process sends to segmentation par.**

Keywords*: *Deaf Human, Sign Language Translation Systems, Humatronics, Automatic Speech Recognition.

I. INTRODUCTION

Today's one in 1000 people become deaf before they have acquired speech and may always have a low reading age for written Persian. Sign is their natural language. Persian Sign Language has its own grammar and linguistic structure that is not based on Persian. So, voice recognition systems play a very significant role in field of human electronics and its wide applications in deaf live his research was started with several speeches to text experiments to measure the communication skills of deaf people, and to understand their everyday problems better. The primary aim of our project was to develop a communication aid for deaf persons which can be implemented in a mobile telephone. In our system a partially animated face is displayed in interaction with deaf users. They are very useful in much application. Our system starts with preprocessing and signal conditioning. Next extracting feature form voice using Cepstral Coefficients will be done. Feature extraction is the process that extracts a small amount of data from the voice signal that can later be used to represent each word. Then the result of this process sends to Feature matching Hand gesture recognition is of great importance for human-computer interaction (HCI), because of its extensive applications in virtual reality and sign language recognition. Despite lots of previous work, traditional vision-based hand gesture recognition methods are still far from satisfactory for many real-life applications. The quality of the captured images is sensitive to lighting conditions and cluttered backgrounds, because of the limitations of the optical sensors. Thus, it is generally not able to detect as well as track the hands robustly. This largely affects the performance of hand gesture recognition. An effective way to make hand gesture recognition more robust is to use different sensors to capture the hand gesture and motion, e.g., through the data glove. Unlike optical sensors, such sensors are generally more reliable and are also not affected by lighting conditions or cluttered backgrounds.

II. EXISTING SYSTEM

A neoteric approach to bridge the communication gap between deaf people and normal human beings. In any community there exists such group of disable people who face severe difficulties in communication due to their speech and hearing impediments. Such people use various gestures and symbols to talk and receive their messages and this mode of communication is called sign language. Yet the communication problem doesn't end here, as natural language speakers don't understand sign language resulting in a communication gap.

III. DRAWBACKS OF EXISTING SYSTEM

- Less User Friendly: The existing system is not user friendly because the retrieval of day-to-day activities data/records is very slow and records are not maintained efficiently and effectively.
- Complex for generating the report: We require more calculations and efforts to generate the report so it is generated at the end of the session. And the student does not get a chance to improve their attendance.
- Lengthy time: Every work is done manually so we cannot generate report in the middle of the session or as per the requirement because it is very time consuming.

IV. METHODOLOGY

The single problem can be solved by different solutions. This considers the performance parameters for each approach. Thus considers the efficiency issues:

1. Problem Solving Methods are concerned with efficient realization of functionality. This is an important characteristic of Problem-Solving Methods and should be deal with it explicitly.
2. Problem Solving Methods achieve this efficiency by making assumptions about resources provided by their context (such as domain knowledge) and by assumptions about the precise definition of the task. It is important to make these assumptions explicit as it gives the reason about Problem Solving Methods
3. The process of constructing Problem Solving Methods is assumption-based. During this process assumptions are added that facilitate efficient ope rationalization of the desired functionality

V. SYSTEM ARCHITECTURE

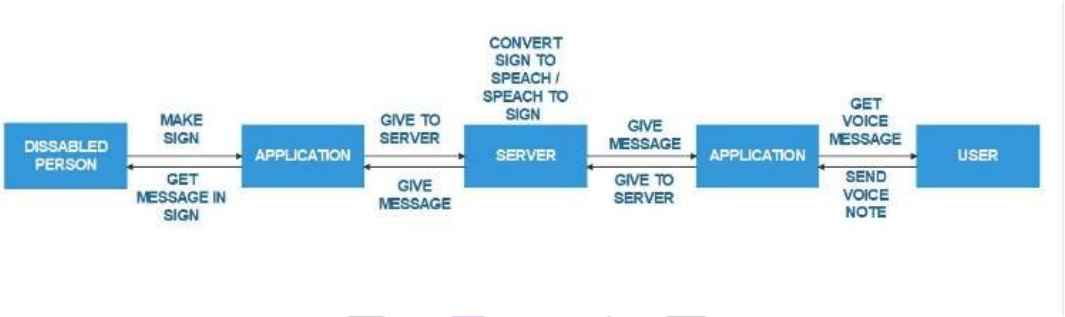


Figure 1: System Architecture Diagram.

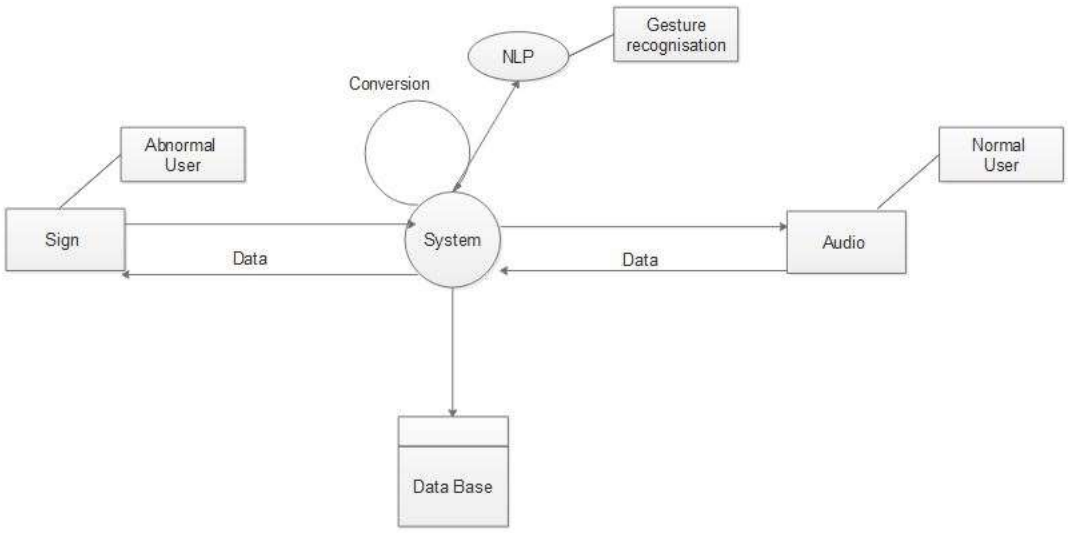


Figure 2: Data Flow Diagram.

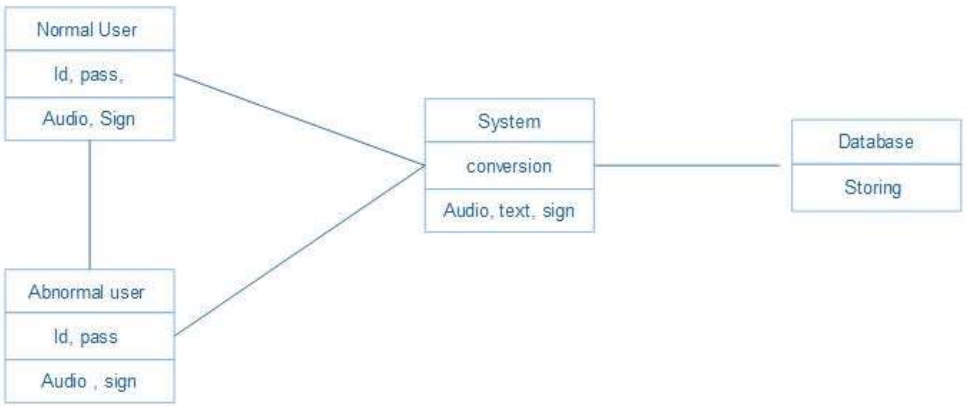


Figure 3: Class Diagram.

VI. ADVANTAGES AND APPLICATION

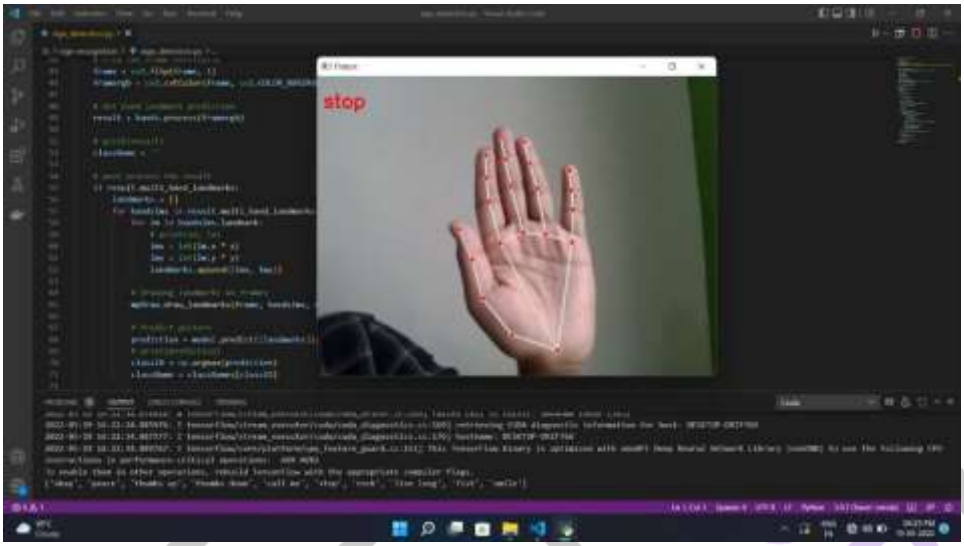
Advantages

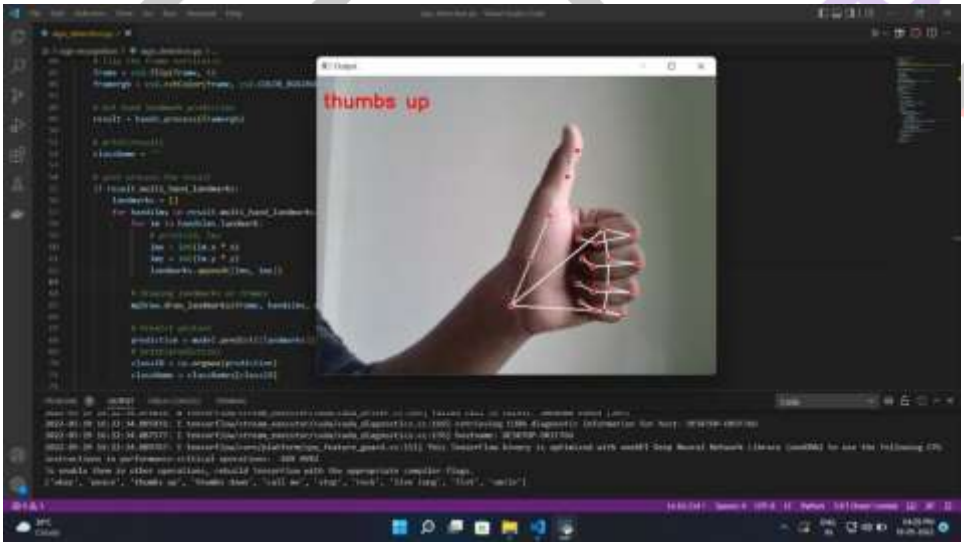
1. Innovative.
2. Centralised Database.
3. Easy to use.
4. Efficient cost.

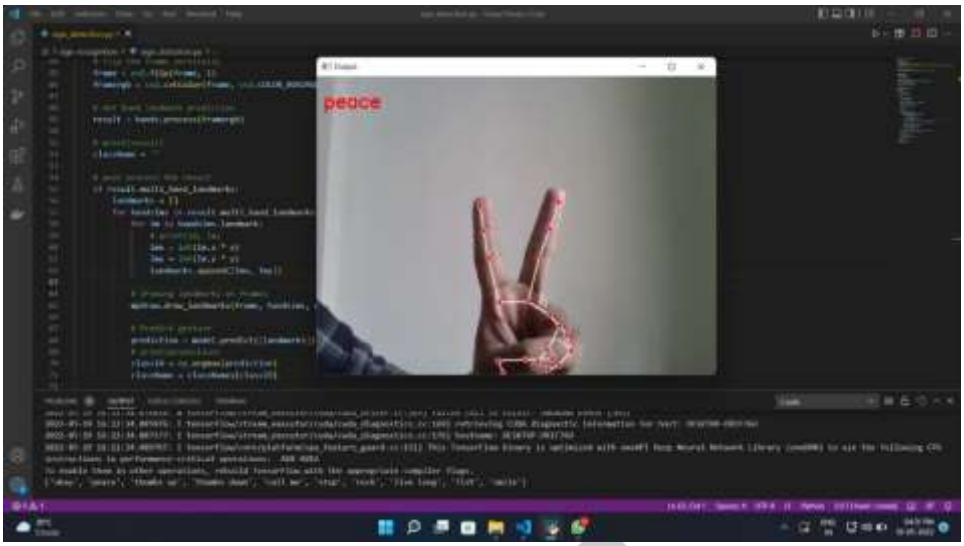
Application

1. Education.
2. Research.
3. Organizations.

VII. RESULT







VIII. CONCLUSION

This system can support the communication between deaf and ordinary people. The aim of the project is to provide a complete dialog without knowing sign language. The program has two parts. Firstly, the voice recognition part uses speech processing methods. It takes the acoustic voice signal and converts it to a digital signal in computer and then show to the user the .gif images as outcome.

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