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Real Time Full Duplex Gesture Vocalizer for Mute People

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ABSTRACT

Making a smart full Duplex interacting system of communication for Mute people. Using this system, normal people can communicate with Mute person by speaking in normal way and the mute person will be able to express what he/she wants to say. Hence the system is termed as full Duplex mode of communication system. When the system is used by mute person, input to the system will be the sign language and output will be in the form of audio(voice) that means the system will vocalize the gesture. When the system is used by normal person, input to the system will be his/her voice and output will be appropriate sign language image which will be understandable to the mute person. In this way this system helps to reduce the time consumption required to communicate between a normal and mute person. This proposed system aims to lower the barrier in communication.

Keywords : Duplex Communication, Sign Language, Video & Image Processing, Voice Recognition, Mute People.

I. INTRODUCTION

Communication is the most important part of the life. About nine billion people in the world are deaf and dumb [1]. Even blind people can also communicate with each other using general language. But deaf and dumb not able to communicate, so they use special language that is sign language. Effective communication is important for the development of society and also plays an important role for human beings. Keeping these important words in mind we are trying to implement a system which will help in improving the communication with the dumb people using video signal processing. This project aims to lower this barrier in communication. Deaf and Dumb people communicate with sign language or gesture.

As shown in figure.1 the percent of employment of deaf and dumb people is very less in India. It is very difficult for mute people to convey their message to regular people as show. Since regular people are not trained on hand sign languages, the communication becomes very difficult [2]. In emergency or other times when a mute person travelling or among new people's communication with nearby people or conveying a message becomes very difficult. Here we propose a smart speaking system which uses Python code that help mute people in conveying their message to regular people using hand motions and gestures. The system makes use of a hand motion reading system along with a speaker unit. The system consists of around multiple stored messages like

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"need help", "where is the toilet/washroom" and so on that help mute people convey basic messages.

This system reads persons hand motions for different variations of hand movement. Once it is found in memory this message is retrieved and is spoken out using text to speech processing through the interfaced speaker. In the same way the regular people can convey their message in terms of voice/audio which will be now the input to this system via mic, which is processed in such a way that this specific message is converted into the sign language, which can be understand by the mute person. Thus, we have a fully functional smart speaking system to help mute people communicate with regular people using a simple wearable system.
The Vocalizer could be used to help mute people communicate with those who do not know sign language. It could also be used to detect eye movement and facial twitches to aid in lie detection. The system has many potential applications. However, in this report the application of more reliable audio communication is explored [3].

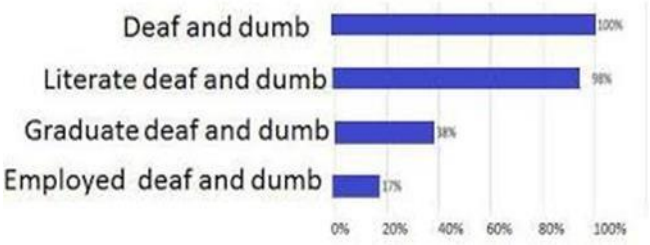

Fig. 1. Employment analysis of deaf and dumb population of India [4]

II. METHODOLOGY

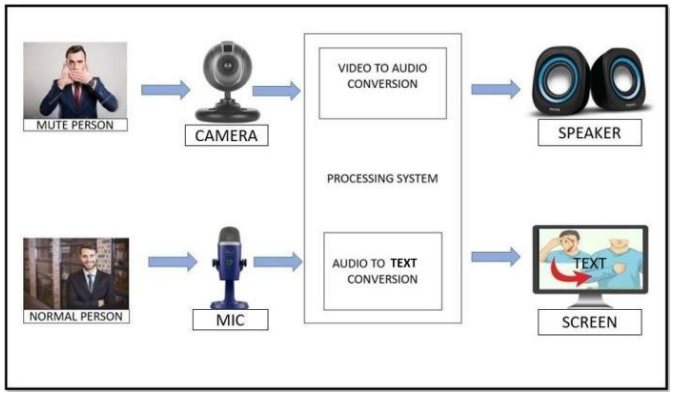

Fig. 2. Block diagram of complete process of Duplex communication system.

Working of Block diagram:

The above diagram shows the block representation of the real time duplex gesture vocalizer for mute people in which mute person makes sign using hand gesture now this is the input to the camera; the camera receives the hand gesture as a set of image frames (videos). This is giving to video to audio conversion block which is the main processing system of our project.

The video to audio converter block converts frame/video into specific targeted audio. And this audio is now the desire output of this system which a normal person understands. Now when the normal person wants to convey his/her message, the normal person needs to speak into the microphone.

Now the message is the input to the audio to picture/frame conversion block via microphone.

The audio to picture converter block converts the audio to the specific targeted set of image or frames and the screen shows/displays the desired sign language image as output which is understandable to the mute person. Hence this way our system helps the mute as well as normal person to convey their feelings.

III. FLOWCHART

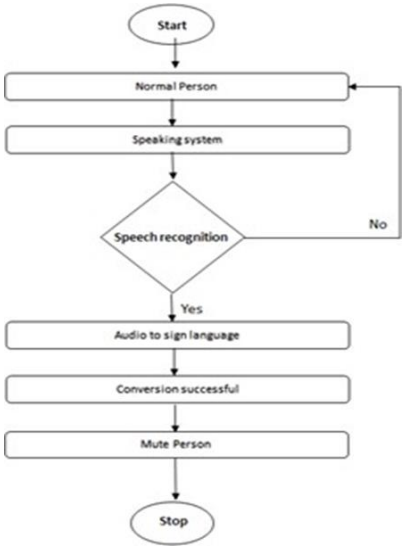

Fig. 3. Process of communication by mute person.

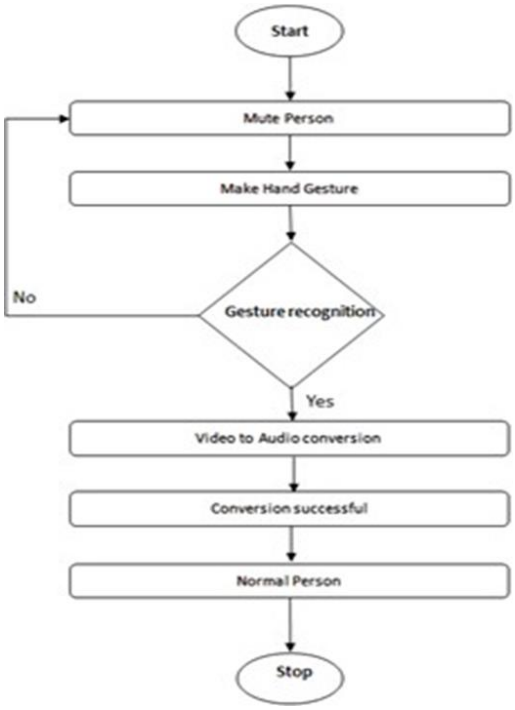

Fig. 4. Process of communication by normal person

IV. RESULT

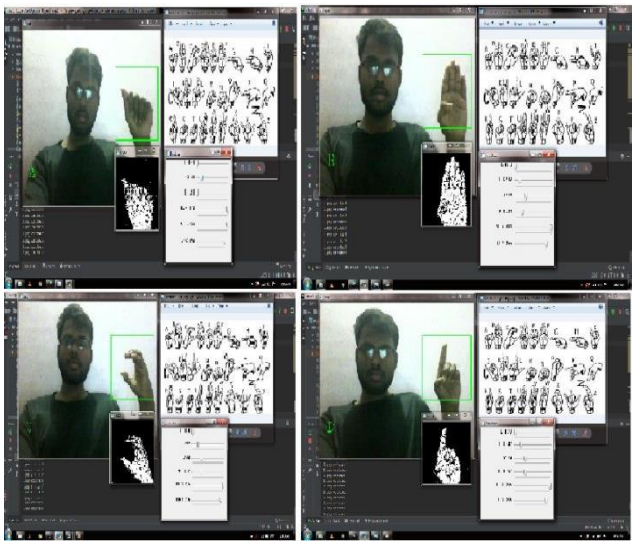

Fig. 5. Result of hand gestures.

The proposed system will spread awareness among the public that there exists a device which will help both the mute and the normal people have conversation which was not possible earlier or was complex task. This project will help the mute people live a better life and will help in day to day activities.

V. CONCLUSION

This proposed system deals with the system which will help the mute people who uses hand gesture system to communicate with the normal people and vice versa. "Real time duplex gesture vocalizer for mute people" is considered as a way for more intuitive and profitable human computer interaction tool. This project describes survey on the different systems available for gesture recognition and the categories involved in hand gestures. One of the systems is explained in brief here. The design and working of a system which is useful for mute people to communicate with the normal people and vice versa. This system converts the sign language into voice which is easily understandable by normal people and the normal people can communicate with the mute people by speaking which will be converted into text by speech recognition.

VI. ACKNOWLEDGMENT

This is to acknowledge our guide Dr. S. M. Koli under whose guidance, our group was able to move forward in the direction of implementing a real time full duplex gesture vocalizer for mute people.

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