

REAL-TIME COMMUNICATION SYSTEM POWERED BY AI FOR SPECIALLY ABLED: A LITERATURE SURVEY

I. INTRODUCTION:

In our society, we have people with disabilities. The technology is developing day by day but no significant developments are undertaken for the betterment of these people. Communications between deaf-mute and a normal person has always been a challenging task. It is very difficult for mute people to convey their message to normal people since normal people are not trained on hand sign language. In emergency times conveying their message is very difficult. The human hand has remained a popular choice to convey information in situations where other forms like speech cannot be used. Voice Conversion System with Hand Gesture Recognition and translation will be very useful to have a proper conversation between a normal person and an impaired person in any language. We aim to develop a system that converts the sign language into a human hearing voice in the desired language to convey a message to normal people. We are making use of a convolution neural network to create a model that is trained on different hand gestures. An app is built which uses this model. This app enables deaf and dumb people to convey their information using signs which get converted to human-understandable language and speech is given as output.

II. LITERATURE SURVEY:

1. **TITLE:** Sign Language Recognition System

AUTHOR: Er. Aditi Kalsh, Dr N.S. Garewal

YEAR: 2013

Abstract:

Communication is the process of exchanging information, views and expressions between two or more persons, in both verbal and non-verbal manner. Hand gestures are the non-verbal method of communication used along with verbal communication. A more organized form of hand gesture communication is known as sign language. In this language each alphabet of the English vocabulary is assigned a sign. The physically disabled person like the deaf and the dumb uses this language to communicate with each other. The idea of this project is to design a system that can understand the sign language accurately so that the less fortunate people may communicate with the outside world without the need of an interpreter. By keeping in mind, the fact that in normal cases every human being has the same hand shape with four fingers and one thumb, this project aims at designing a real time system for the recognition of some meaningful shapes made using hands.

Limitations:

The background of an image must be free from external objects. Also, the distance between the image and the camera is kept fixed.

2. **TITLE:** Full Duplex Communication System for Deaf & Dumb People

AUTHOR: Shraddha R. Ghorpade, Surendra K. Waghmare

YEAR: 2015

Abstract:

One of the important problems that our society faces is that people with disabilities are finding it hard to cope-up with the fast-growing technology. The access to communication technologies has become

essential for the handicapped people. Generally deaf and dumb people use sign language for communication but they find difficulty in communicating with others who don't understand sign language. Sign language is an expressive and natural way for communication between normal and dumb people (information majorly conveyed through the hand gesture). So, we need a translator to understand what they speak and communicate with us. sign language to speech and hence makes the communication between normal person and dumb people easier. But the question arises, how the deaf person understands the speech of a normal person and hence we need a system which converts the speech of normal person to text and the corresponding gesture is displayed on display. So, the whole idea is to build a device that enables two-way communications between deaf-mute person and a normal person.

Limitations: Gloves are mandatory. Without them, the system would not work. It is not feasible to carry gloves all the time. These are expensive as well.

3. **TITLE:** A Communication System for Deaf & Dumb

AUTHOR: Anchal Sood , Anju Mishra

YEAR: 2016

Abstract:

The paper proposes a framework for recognizing hand gesture which would serve not only as a way of communication between deaf and dumb and mute people, but also, as an instructor. Deaf and dumb individuals lack in proper communication with normal people and find it difficult to properly express themselves. Thus, they are subjected to face many issues in this regard. The sign language is very popular among them and they use it to express themselves. Thus, there is a need of a proper translator. The deaf and dumb are not idle as past, they are working outside and doing great at it. So, an efficient system must be set up, to interact with them, to know their views and ideas. The framework here, act as a communication system for deaf and dumb individuals. It would take the sign language as an input which would display the result not only in the form of text but also in the form of audio. Similarly, if there is any input in the form of text, it would display the corresponding image.

Limitations: The proposed framework is good for recognizing hand gestures. But it is not feasible in every environment.

4. **TITLE:** Artificial Intelligence enabled virtual sixth sense application for the disabled.

AUTHOR: Muhammad Usman Tariq

YEAR: 2020

Abstract:

The main purpose of this research is to enhance the communication of the disabled community. The author of this chapter propose an enhanced interpersonal human interaction disabilities. The proposed model comprises of automated real time behavior monitoring designed and implemented with the ubiquitous and affordable concept in mind to suit the under privileged. In this chapter, the authors present the prototype which encapsulates an automated facial expression recognition system for monitoring the disabled equipped with a gesture to send short messaging system (SMS) for notification purposes. The authors adapted the Viola-Jones face detection algorithm at the face detection stage and implemented template matching technique for the expression classification and recognition stage. They tested their model with a few users and achieved satisfactory results. The enhanced real time behavior monitoring system is an assistive tool to improve the quality of life for the disabled by assisting them anytime and anywhere when needed. They can do their own tasks more independently without constantly being monitored physically or accompanied by their caretakers, teachers or even parents. The rest of this chapter is organized as follows. The background of the facial expression recognition system is reviewed.

III. CONCLUSION:

From the above literature survey, we can conclude that all those papers follow a more or less similar methodology. We also like to follow that methodology with some improvements to overcome some of the limitations mentioned above. The input image is processed to isolate the hand. Then it is passed to a trained convolution neural network to identify the gesture with greater accuracy.