# Technology That Allows the Deaf and the Mute to Communicate Using Only Their Hands

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**ABSTRACT—** Communication is the main channel between people to communicate with each other. In the recent years, there has been rapid increase in the number of deaf and dumb victims due to birth defects, accidents and oral diseases. Since deaf and dumb people cannot communicate with normal person so they have to depend on some sort of visual communication. There are many languages spoken all around the world and interpreted. "Special people", that is people who have difficulty in speaking and hearing "The dumb" and "The deaf" people respectively find it difficult to understand what exactly the other person is trying to express and so with the deaf people. Sometimes people interpret these messages wrongly either through sign language or through lip reading or lip sync. This project is made in such a way to help these specially challenged people hold equal par in the society.

**INTRODUCTION**

Nowadays we always hear about new technology that improves our lifestyle, that makes our life easier. Technology has revolutionized the human mankind. Human race has put a gear in technology and they are not in a mood to move the pedals away from this gear. There is huge research on various technology sector such as Artificial Intelligence, Smart phones and many more. This research lead to new inventions and making one's life easier. But there has been a very less research for Deaf and Dumb people. This topic has get less attention as compared to other sectors. The Main

challenges that this special person facing is the communication gap between -special person and normal person. Deaf and Dumb people always find difficulties to communicate with normal person. This huge challenge makes them uncomfortable and they feel discriminated in society. Because of miss communication Deaf and Dumb people feel not to communicate and hence they never able to express their feelings. HGRVC (Hand Gesture Recognition and Voice Conversion) system localizes and track the hand gestures of the dumb and deaf people in order to maintain a communication channel with the other people. The detection of hand gestures can be done using web camera. The pictures are then converted into standard size with the help of pre-processing. The aim of this project is to develop a system that can convert the hand gestures into text. The focus of this project is to place the pictures in the database and with database matching the image is converted into text. The detection involves observation of hand movement. The method gives output in text format that helps to reduce the communication gap between deaf-mute and people.

**RELATED WORK**

**Real-time two-way communication approach for hearing impaired and dumb person based on image processing**

In the recent years, there has been rapid increase in the numberof deaf and dumb victims due to birth defects, accidents and oral

diseases. Since deaf and dumb people cannot communicate withnormal person so they have to depend on some sort of visualcommunication. Gesture shows an expressive movement of bodyparts such as physical movements of head, face, arms, hand orbody which convey some message. Gesture recognition is themathematical interpretation of a human motion by a computingdevice. Sign language provide best communication platform forthe hearing impaired and dumb person to communicate withnormal person. The objective of this research is to develop a realtime system for hand gesture recognition which recognize handgestures, features of hands such as peak calculation and anglecalculation and then convert gesture images into voice and viceversa. To implement this system we use a simple night visionweb-cam with 20 megapixel intensity. The ideas consisted ofdesigning and implement a system using artificial intelligence,image processing and data mining concepts to take input as

handgestures and generate recognizable outputs in the form of textand voice with 91% accuracy.

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in the form of text and voice with 91% accuracy.

**"Computer vision-based approach for Indian Sign Language character recognition."**

Deaf and dumb people communicate among themselves using sign languages, but they find it difficult to expose themselves to the outside world. This paper proposes a method to convert the Indian Sign Language (ISL) hand gestures into appropriate text message. In this paper the hand gestures corresponding to ISL English alphabets are captured through a webcam. In the captured frames the hand is segmented and the state of fingers is used to recognize the alphabet. The features such as angle made between fingers, number of fingers that are fully opened, fully closed or semi closed and identification of each finger are used for recognition. Experimentation done for single hand alphabets and the results are summarised.

**"AAWAAZ: A communication system for deaf and dumb."**

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.

**METHODOLOGY**

Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it. It is a type of signal processing in which input is an image and output may be image or characteristics/features associated with that image. Nowadays, image processing is among rapidly growing technologies. It forms core research area within engineering

and computer science disciplines too. There are two types of methods used for image processing namely, analogue and digital image processing. Analogue image processing can be used for the hard copies like printouts and photographs. Image analysts use various fundamentals of interpretation while using these visual techniques. Digital image processing techniques help in manipulation of the digital images by using computers. The three general phases that all types of data have to undergo while using digital technique are pre-processing, enhancement, and display, information extraction
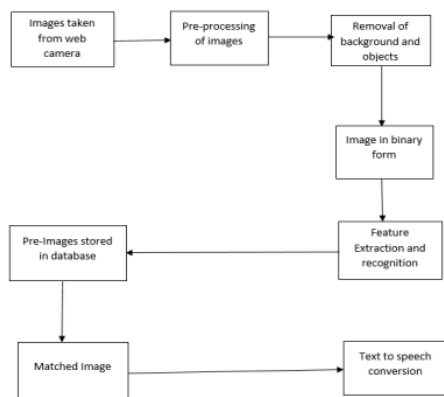


**RESULT AND DISCUSSION**

If you run the code then you get the interface like below screen



After that you need to upload the dataset based on the dataset we are trained our algorithm by giving names and as well as image so after building the model folder with cnn. We already trained our model folder with giving image and labels so it if you want to know the output then with the help of pressing button we are owning the webcam and that stage if you show the trained sign then it will automatically give the voice for that particular gesture.
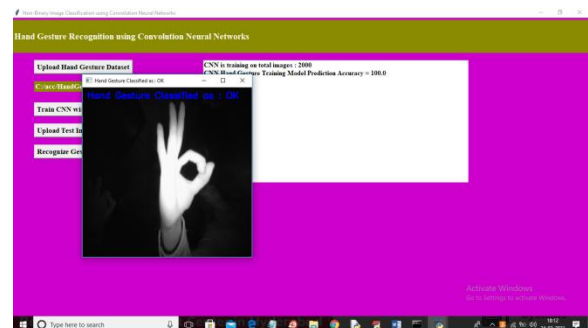
## CONCLUSION

We developed a CNN model for sign language recognition. Our model learns and extracts both spatial and temporal features by performing 3D convolutions. The developed deep architecture extracts multiple types of information from adjacent input frames and then performs convolution and subsampling separately. The final feature representation combines information from all channels. We use multilayer perceptron classifier to classify these feature representations. For comparison, we evaluate both CNN and GMM-HMM on the same dataset. The experimental results demonstrate the effectiveness of the proposed method.

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