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# Static Hand Gesture Recognition Paper

Sign language is basically creating hand gesture to describe the alphabets, number, some special words, names and even sentences to express thoughts of speaker. Gestures are powerful mean of communicating between two deaf humans. This paper basically describes how to recognize alphabetical sign from A to Z, numbers from 0 to 9 and additional punctuation mark such as Question mark, period and space.

## Introduction

Humans nowadays make use of gesture to communication and due to information technology the influence of the way people communicate and exchange information with each other has become the basic core. Human computer interaction (HCI) has developed nowadays. HCI has come in picture for the deaf people to indicate sign language. HCI basically deals with some methods such as Computer vision and speech recognition. Computer vision is used to extract the most important data of the image and acquire image with help of image processing. Speech Recognition basically handles input speech in form of NATO phonetic alphabet also known as The International Civil Aviation Organization (ICAO) phonetic alphabet given by the person in any respective language.

## Brief Description

### Sign Language

Sign language is described through combination of hand gestures, movement of hands, body and facial. Education and training has become faster and easier for deaf people through the use of sign language. For deaf and dumb people converting sign language to normal text and given text to sign language is important. Sign language recognition is done in three different categories;

1. Glove based analysis
2. Device based analysis
3. Vision based analysis. Sign language represents dynamic hand gesture that has hand, body and face to produce word; it also represents static hand gestures to produce letters and numerical numbers. Sign languages are used to produce more intended and accurate word.

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## Hand Gesture

Hand gesture basically involves use of skeleton as it can also describe define sign languages. There are two widely method to describe hand gesture recognition:

- Static Hand Gestur – A process in which there is no movement and hand is always kept stable.
- Dynamic Hand Gesture – A process in which there is movement after particular interval which depends over period of time.

## Image Processing

Image processing is process use to convert original image into enhanced image by performing some operations. Morphological operation are the image processing which operates and processes the binary image. Erosion and dilation are two basic morphological operations. Image processing is basically considered as signal processor as it takes images as an input and produce enhanced image as an output.

## Image Capturing

Image capturing is process use to capture image of person doing hand gesture through camera. It is used so that indirect understanding of person does not occur when other person gestures something through hands. Image capturing can be grey scale image or rgb image based on the camera.

## Advantages

A. Ability to work with incomplete knowledgelt allows the person to have short idea about the hand gesture the other person is performing though it might be incomplete information. The loss of performance will be lesser.

B. Speech translationIt enables the ability to listen and recognize the words that have ordered them to listen to. It enables create grammar objects which is used to maximize the efficiency of recognition.

C. Storing hand gestureIt has ability to store information of hand gesture with the image capturing which helps users to get ideas of the gesture which are performed.

## Disadvantages

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There can be problem of spelling big names using alphabets which will take more time and complexity also gets increased. When deaf and dumb people try to communicate using sign language to people who are unaware of the language.

## Conclusion

NATO phonetic enables user to recognize sentences and letters. It enables users who do not sign languages to interact with those speak in sign languages. Different information is stored about sign languages through artificial neural network. Researchers are facing major problem of availability of standard database. Authors tried to focus on challenges for vision based and sign language interpretation system with an objective, to give an overall glimpse of SL interpretation need, existing image processing and pattern recognition techniques available in the literature.

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