

## Speaking System For Mute

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**Abstract:** Human Computer Interaction pushes ahead in the field of communication through signing translation. Gesture based communication Interpretation framework is a decent method to help the hearing impeded individuals to associate with typical individuals with the assistance of PC. Vision based hand signal acknowledgment framework have been talked about as hand plays crucial correspondence mode. Thinking about prior announced work, different procedures accessible for hand tracking, segmentation, feature extraction and classifications are listed. The aim of this system is to enable the correspondence of two to individuals, one speaking weakened and one with no speaking inabilities by changing over speech to finger sign and finger sign to speech. Finger sign (Gesture) is a subset of Sign Language and utilizes finger signs to spell expressions of the talked or composed dialect. By proficient utilization of PC vision and pattern recognition, it is conceivable to deal with such framework which will be characteristic and acknowledged as a rule.

**Keywords:** Contour Extraction, Grey Scaling, Hand Gesture Recognition, Segmentation, Skin Color Detection.

### I. Introduction

HCI (Human-Computer Interaction) is a term that was advanced by Stuart K. Card, Allen Newell, and Thomas P. Moran in their original 1983 book "The Psychology of Human-Computer Interaction". It is the study of how individuals collaborate with PCs and to what degree PCs are or are not produced for fruitful c with people. Sign language communication was concocted to be a medium to impart among the deaf and dumb. In any case, the vast majority don't comprehend the hand gesture-based communication, creating a huge gap between people and the deaf or the mute and also troubles in their day by day life living. Conceivable outcomes are less in understanding the communication via sign language of mute people by ordinary individuals in such places like bank, presentations, booking counters and so on. These days human beings have been skilled, by nature, with voice that enables them to cooperate and speak with each other. Consequently, spoken dialect ends up one of the principle traits of people. Shockingly, not every person has this capacity because of the absence of one sense, i.e. listening and talking. In India, there are around five to fifteen million almost totally senseless individuals, Sign language is the fundamental elective specialized strategy between disabled individuals and a few lexicons of words or single letters have been characterized to make this correspondence possible. It is hard for a great many people who are not comfortable with a gesture-based communication to convey without a mediator. Along these lines, framework that translates images in gesture-based communications into plain content or sound can help with continuous correspondence. The past frameworks had diverse beginning allotments that can result about various final clusters and in addition it is a protracted procedure. The current framework is unpredictable in nature and takes immense time term to create an output. It additionally incorporates all-time gloves. The objective of our system are as follows:

- 1.To design a close to real time system that performs conversion of finger sign to speech
  - 2.To design various modules of the system that is required to complete the given task which are listed below
- Finger sign recognition module.
  - Speech recognition module.
  - Finger sign synthesis.
  - Speech synthesis.

### II. literature review

These are a portion of the related papers identified with proposed framework. Writing Review goes about as the premise of research and investigation of the different ideas required for a specific area. It depicts

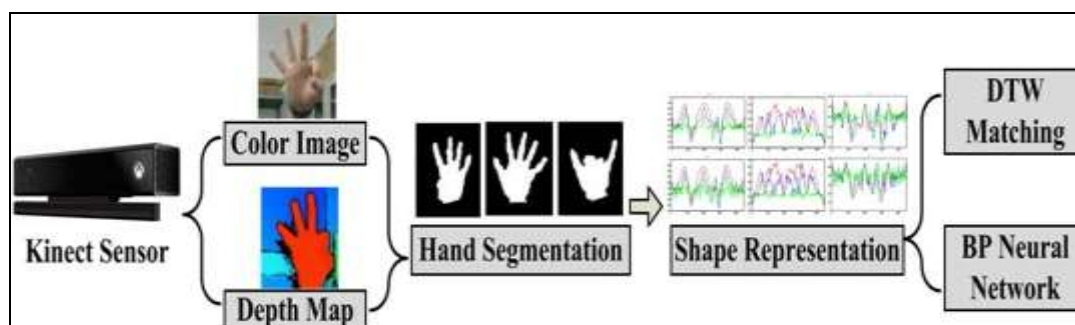
the theories and different approaches that can be embraced keeping in mind the end goal to implement modules of the proposed framework.

### 1.1 Real-Time Hand Gesture Recognition Via Finger Emphasized Multi-Scale Description [1]

The author in [1] introduces hand gesture recognition framework utilizing the Kinect sensor and a finger-emphasized multi-scale descriptor that is used for hand signal portrayal which were powerful to noises, hand enunciation and inflexible changes. DTW and BPNN techniques were used to perform the hand gesture recognition that is also applicable for real time applications.

#### 2.1.1 Working

The proposed system included a new real time hand gesture recognition method that represented the segmented hand from Kinect images. The Multi-scale descriptor consists of three sorts of parameters, which underscores the feature extraction. As shown in Fig.1 later DTW Algorithm and neural network was been applied to achieve hand gesture recognition.



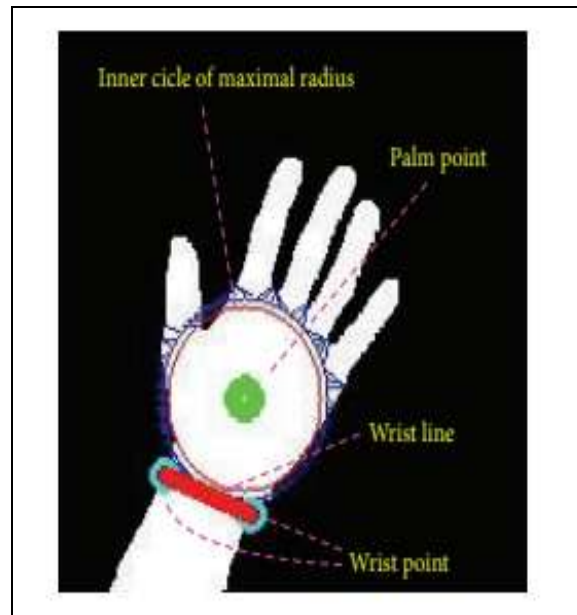
**Fig. 1.** block diagram of their proposed system [1]

### 2.2 Real-Time Hand Gesture Recognition Using Finger Segmentation [2]

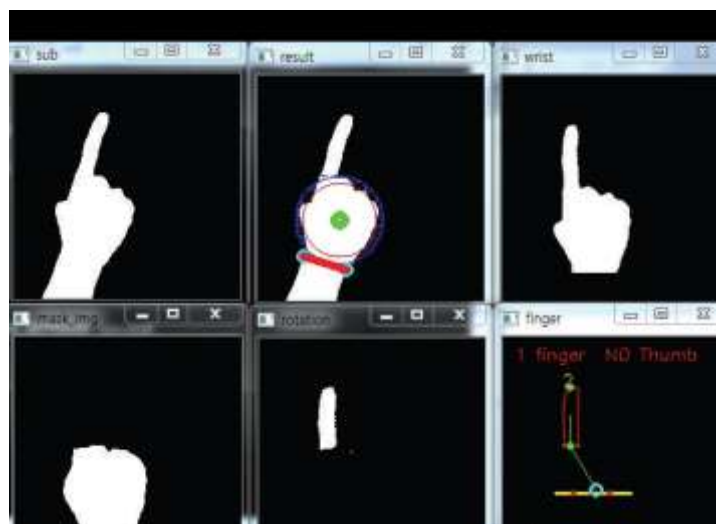
The author in [2] has proposed a system where the hand region is extracted from the background with the background subtraction method. Then, the palm and fingers were divided so as to detect and recognize the fingers. After the fingers got recognized, the hand signal can be characterized through a basic run classifier.

#### 2.2.1 Working

Here in the first place, the hand was recognized utilizing the foundation subtraction strategy and the consequence of hand identification was changed to a twofold picture. At that point, the fingers and palm were sectioned as appeared in Fig. 2 to encourage the finger recognition. In addition, the fingers were identified and perceived. Ultimately, hand motions were perceived utilizing a basic rule classifier. These pictures were caught as appeared in Fig. 3 with an ordinary camera. The yield of the hand identification was a binary picture in which the white pixels represented the individuals from the hand locale, while the dark pixels showed a place with the background.



**Fig. 2** features of the hand [2]



**Fig. 3** implementation process [2]

### 2.3 A colour fingertip-based tracking method for continuous hand gesture recognition [3]

The author in [3] uses colour fingertip-based tracking technique. The objective of this paper was to report a strong and productive hand segmentation calculation where a unique technique, wearing the gloves on hand was used. The proposed model was not dependent on any background and lighting conditions. Real time recognition process with no time delay was one of the highlighted factor offered by this model.

#### 2.3.1 Working

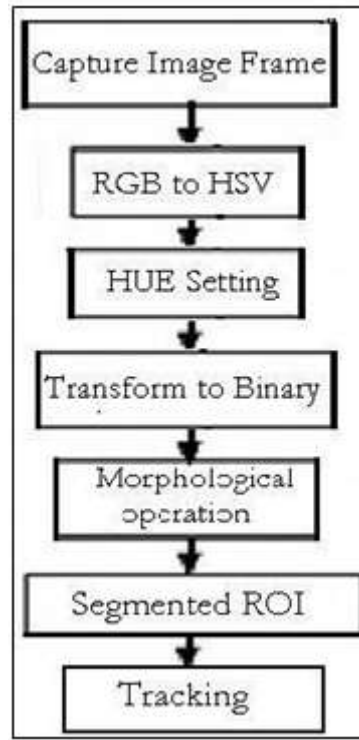
The proposed model shall be summarized as follows

Stage 1- First the input image outline was changed over from RGB plane to HSV shading plane.

Stage 2- Hue esteem was then set legitimately for the shade of the hand glove or the top of the finger.

Stage 3- Later the HSV plane got changed over to binary plane.

Stage 4- Certain morphological tasks, for example, dilation-erosion on the parallel plane gave an appropriate sectioned outcome and the movement of the portioned ROI gave a track path as appeared in Fig. 4 underneath.



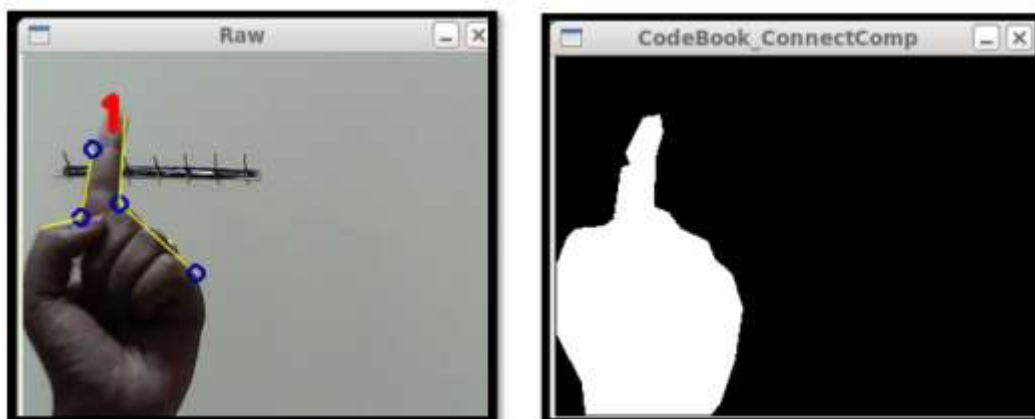
**Fig. 4** process flow of their proposed system [3]

#### 2.4 Implementation of Real Time Hand Gesture Recognition [4]

The author in [4] introduces a numeric hand gesture recognition real time system. In this paper principle objective of the author was to tally the quantity of fingers which are unfurled continuously. The constant recognition process consisted three principle steps which were foundation subtraction by utilizing codebook algorithm, shape, arched body and convexity imperfection figuring and last convexity imperfection estimation.

##### 2.4.1 Working

First the number of fingers was checked based upon the computation of defect points. Back ground subtracted steps performed gave the back ground subtracted picture as the output. Later the back ground subtracted picture represented the hand as white shading and foundation as dark color as shown in Fig. 5. This paper implemented acknowledgment of hand signal progressively and it was executed utilizing Intel Atom Processor utilizing OpenCV.



**Fig. 5** the resulted output of their proposed system [4]

## 2.5 Implentation of Hand Gesture Recognition Technique for HCI Using Open CV [5]

The author in [5] exhibited a strategy to locate the quantity of fingers present in the hand motion. They are utilized as a part of various applications. Here, the creator made utilization of K-implies bunching algorithm for division of the picture. They also made utilization of bounding box to discover the introduction.

### 2.5.1 Working

This paper presents a hand gesture acknowledgment framework which uses just hand motions to speak with the PC framework. First calculation was partitioned into three sections: preprocessing, division and feature extraction. In feature extraction, the author discovered snapshots of the motion picture, centroid of the picture and Euclidean separation to identify the finger count. As shown in Fig. 6 they also used contours, arched frame and convexity imperfections to discover the hand motion.

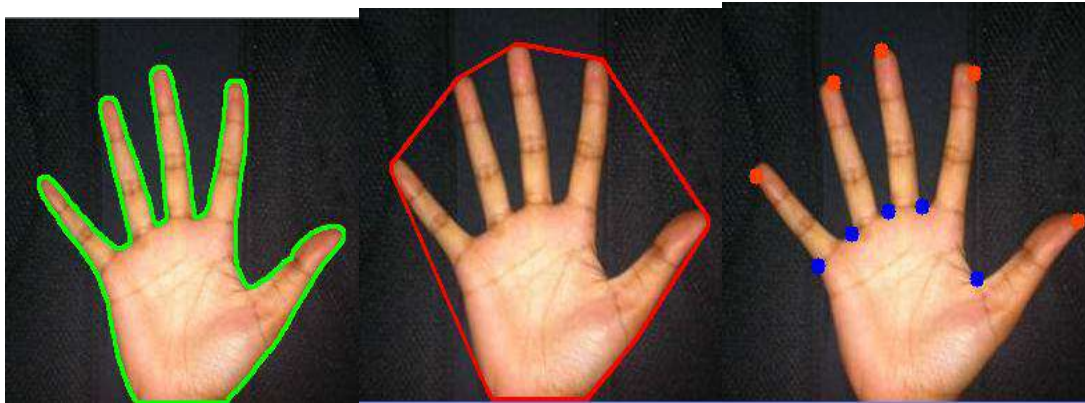


Fig. 6 contour, convex hull and convexity defects of the hand [5]

TABLE: Review of Literature

Sr.No	Name of the paper	Name of the author	Proposed work
1	Real-Time Hand Gesture Recognition Via Finger Emphasized Multi-Scale Description	Jianyu Yang, Chen Zhu, Junsong Yuan	1.Uses kinect sensor and a finger-emphasized multi-scale descriptor. 2.Uses DTW algorithm and BPNN
2	Real-Time Hand Gesture Recognition Using Finger Segmentation	Zhi-hua Chen, Jung-Tae Kim, Jianning Liang, Jing Zhang and Yu-Bo Yuan	1.Uses SVM and CRF classifiers 2.Focuses on Palm mask
3	A colour fingertip-based tracking method for continuous hand gesture recognition	Dharani Mazumdar, Anjan Kumar Talukdar & Kandarpa Kumar Sarma	1.Uses Gloves 2.Introduces "Finger-Pen"
4	Implementation of Real Time Hand Gesture Recognition	Manasa Srinivasa H S, Suresha H S	1.Uses external webcam 2.Uses Code-book algorithm
5	Implentation of Hand Gesture Recognition Technique for HCI Using Open CV	Nayana P B, Sanjeev Kubakaddi	1. Uses HMM based method 2.Built to identify numeric gestures

## III. Conclusion

In this proposed system we have viewed in detail the Literature Survey of the previous proposed systems. Basically, these systems involved various methods such as identifying hand gestures based on alphabet or numeric format using Kinect Sensors, Gloves, BPNN, SVM and CRF types of complex classifiers. They also consisted of several different algorithms like K-means clustering algorithm, Code book Algorithm, DTW algorithm. Hence, we hereby conclude that amongst these systems the most efficient and simplest method would be detecting the hand gesture by Skin color detection technique which we will be using in our proposed system. The main advantage of our system would be to provide cheapest, effective and easy to use nature with open source software and hardware such as python and perform Binarization followed by Contour extraction and later

converting the associated text message to speech. Our system focuses on helping the mute people to overcome their disabilities and the challenges that they face in day-to-day life.

### **References**

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