

FUNCTIONAL FEATURES

- A detection algorithm is used to detect the hand of the user, and a contour-based hand tracker is developed, which combines condensation and partitioned sampling.
- The proposed approach can attain automated online identification of hand movements and can effectively reject a typical movements.
- The experimental results indicate that the proposed algorithm can produce better results for recognition than the conventional method of hand recognition.
- The hand gesture recognition system consists of three major parts: palm detection, hand tracking, and trajectory recognition.

The basic algorithm structure for our process of recognition is the following:-

- Detect the palm from the video and initialize the tracker with the template of hand shape.
- Track the hand motion using a contour-based tracker and record the trajectory of the palm center.
- Classify the gesture using HMM, which gives the maximum probability of occurrence of observation sequence.
- The webcam may take images in the dataset with the distance between the hand and the cam around 3-4 feet.

Training Phase

- The training phase was based on storing the images in the database. The database contained images of hands, both men and women.
- The training was based on identifying all possible signs that can be made using one hand. For this purpose, 30 different images with different levels of lights and duration were captured and stored in the database.
- These images were used as training images that will help in making the right decision for the tasks. The database contained over 1000 images of unique hands and signs.

Gesture Recognition

- Algorithms that able to treat each finger as a cluster and delete the empty spaces between them or multi-scale color feature hierarchies that provide users' hand and the different background shades of colors to identify and remove the background.
- Hand tracking is the computer's ability to track the user's hand and split it from the background or any other objects.
- D-talk, finger status, skin color, alignments of the finger, and the palm position are taken into consideration.
- classification algorithms to reach the output.

Exception handling

- While building this system, there was only one issue. The system is very sensitive. It catches any element in the box. So, the user must be careful to have a blank background. The result was as below when the user signs a gesture, and the system will decide which sign reflect which website.
- To validate the method proposed in this paper, we conducted two experiments.
- The first experiment is men hand region segmentation. We use 50 hand region samples with a different gesture and 50 women hand region samples.
- We take 70 samples as test data and 30 samples as validation data.
- The accuracy of segmentation is 60%, where among ten gestures, 6 of them are defined correctly.
- To sum up, the experimental accuracy can meet actual needs. D- talk as an application for PCs is very useful because it has its signs which consider as easy and understandable signs, they are not complex as regular sign language signs.
- D- talk use machine learning model accuracy in figuring out which model is best at distinguishing connections and examples between factors.