# SRM Institute of Science and Technology, Delhi- NCR, Modinagar Major Project & Guide Consent

**(Review 0, 06/12/2020)**

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# Abstract

Pattern recognition and Gesture recognition are the growing fields of research. Being a significant part in non-verbal communication hand gestures are playing vital role in our daily life. Hand Gesture recognition system provides us an innovative, natural, user friendly way of interaction with the computer which is more familiar to the human beings. Gesture Recognition has a wide area of application including man-machine interaction, automated sign language translation, immersive game technology, home automation etc. Gesture recognition can be conducted with techniques from computer vision and image processing. This project introduces a hand gesture recognition system to recognize real time gesture in unstrained environments. Efforts should be made to adapt computers to our natural means of communication: Speech and body language. A simple and fast algorithm using orientation histograms will be developed. It will recognize a subset of MAL static hand gestures. The pattern recognition system will be using a transform that converts an image into a feature vector, which will be compared with the feature vectors of a training set of gestures. The final system will be a Neural Network implementation. To implement this approach, we will utilize a simple web cam which is working on 20 fps with 7 mega pixel intensity. On having the input sequence of images through web cam it uses some pre-processing steps for removal of background noise and employs K-means clustering for segmenting the hand object from rest of the background, so that only segmented significant cluster or hand object is to be processed in order to calculate shape based features. This proposed implemented algorithm will try to attain approximate recognition rate around 80-90%.

The following members will do their final project Work under my supervision and guidance.

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The Project Title is **DYNAMIC HAND TRACKING & GESTURE DETECTION SYSTEM for**

**MAN-MACHINE INTERACTION** , has my consent and approval.

Signature of Faculty Guide

Name of Faculty Guide Mobile No. e-Mail

**INPUT:-**

The continuous stream of Images captured by the web cam of a laptop or a computing machine of hand-gestures will be taken as an input.

Hand-Gestures such as,

Point: to move the cursor

Pinch: to zoom-in and zoom-out

Scroll: to scroll the page

Wave: to close

Two fingers: to right click.

**OUTPUT:-**

Support for following hand-gestures,

* Point: to move the cursor around the screen
* Pinch: to zoom-in or zoom-out
* Scroll: to scroll the page
* Wave: to close
* Two fingers: to right click
* Flick: to change desktop
* Three-fingers: to select
* Four-fingers: to open option menu
* Thumbs-up: customizable gesture.

**DESCRIPTION:-**

Depending on the type of the input data, the approach for interpreting a gesture could be done in different ways. However, most of the techniques rely on key pointers represented in a 3D coordinate system. Based on the relative motion of these, the gesture can be detected with a high accuracy, depending on the quality of the input and the algorithm's approach.  
In order to interpret movements of the body, one has to classify them according to common properties and the message the movements may express. For example, in sign language each gesture represents a word or phrase. The taxonomy that seems very appropriate for Human-Computer Interaction has been proposed by Quek in "Toward a Vision-Based Hand Gesture Interface". He presents several interactive gesture systems in order to capture the whole space of the gestures:

1. Manipulative
2. Semaphoric
3. Conversational

Some literature differentiates 2 different approaches in gesture recognition: a 3D model based and an appearance-based.[[34]](https://en.wikipedia.org/wiki/Gesture_recognition#cite_note-34) The foremost method makes use of 3D information of key elements of the body parts in order to obtain several important parameters, like palm position or joint angles. On the other hand, Appearance-based systems use images or videos for direct interpretation.