

# Survey of Hand Gesture Recognition Systems

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**Abstract.** Recognition of human gestures is an important subject in computer science, especially in computer vision and sign language. It aims at interpreting human gestures by mathematical models. Gestures originate from different parts of the human body, but the most common ones emerge from the hand or face. Gestures recognition is a method to enable computers to understand and interpret the language of the human body in the best way possible and to build a bridge between humans and machines from uncomplicated user interfaces that have been command-line to graphical user interfaces GUI, so far they limit the common input on the keyboard and mouse. In this paper, we have reviewed and analyzed several methods of recognition for hand gestures including, Artificial Neural Networks (ANN), Histogram based feature, a Fuzzy Clustering algorithm, Hidden Markov Model (HMM), Condensation algorithm and Finite-State Machine (FSM).

## 1. Introduction

The gesture is defined as a form of nonverbal communication or non- vocal communication where the body's movement can convey certain messages. Gestures originate from different parts of the human body, but the most common ones emerge from the hand or face.

The development of computer technology led to the need for natural communication between humans and machines. Although our new mobile devices use touchscreen technology, they are not cheap enough to be implemented on desktop systems. The mouse is very useful to control the machine, but it may be inappropriate to use for people with physical disabilities and people who are not accustomed to using the mouse to interact.

In [1], Krueger introduced the first gesture-based interaction as a new type of Human-Computer Interaction (HCI) in the mid-1970s. A few years later, exactly in 2006, (HCI) became a significant area of the research.

The greater category of gestures is made by hand (one or two) because the human enable represent by hand several of arrangements that can be clearly distinguished. Finally, hand gestures are very important for sign language.

There are four categories of hand gestures, conversational-gestures, controlling-gestures, manipulated-gestures, and communication-gestures [2]. The important state of communication-gestures is a sign language, it used for test-bed of vision algorithms because it has a high structural [3]. At the same time, the sign language enables the disable people from interacting in an easy way with the

