Vision-based dynamic hand gesture recognition techniques and applications: A review

ABSTRACT

Hand gesture recognition is an area in computer science that focuses on utilizing mathematical algorithms to analyze human gestures. The aim of this study is to perform a review evaluating related input devices, techniques, limitations and problems of dynamic hand gesture recognition using vision-based methods. More precisely, the hand gesture recognition process is divided into four stages: (a) input image, (b) segmentation, (c) feature extraction and (d) classification/recognition. Gesture control is the ability to acknowledge and interpret human body movements using a variety of gestures or motions made in the air by interacting and controlling devices without having the need to physically touch them. The Single Camera, Leap Motion Controller (LMC) and Microsoft Kinect are the three vision-based hand gestures devices that are compared in this review paper.We found out that the Single Camera is able to perform and achieve an accuracy rate of more than 95%. Besides, this paper not only is able to differentiate and compare the accuracy rate between the input devices, but also between the techniques applied which consists of (a) Hidden Markov Model, (b) DynamicTimewarping and (c)Neural Network including their advantages as well as the disadvantages. The applications that are used in vision-based dynamic hand gesture recognition are presented.