Abstract

Natural Interface with Computer using the intelligent approaches is the need of Human Computer Interaction (HCI) applications. In this paper, three techniques were proposed and experimented for interaction with Desktop/Laptop with static hand gesture. All these techniques were using real time approach with different feature descriptors such as Fourier Descriptor (FD), 7 Hu moments, Convex Hull and Finger Detection. Real time Recognition efficiency was calculated with respect to recognition time for FD and 7 Hu moments. The 300 samples were trained and stored into database for recognition. For unknown user average recognition time was required 1.7 sec using FD as a feature and 4.6 sec using 7 Hu moments and recognition efficiency was achieved 96% and 98% using 7 Hu and FD respectively. In the second technique New Finger detection algorithm was developed and experimented with Hand tracking system (HTS). In this approach, system was working in dynamic background but gives better result in static background. In the third approach, 3-D Kinect camera was used where hand segmentation was achieved using depth image and finger detection were calculated using Convex Hull. In this approach hand segmentation became easier than first two techniques. With all these approaches feature extraction using 7 Hu and FD can be extend for any other HCI application including sign language recognition. Finger counting algorithm can be combined with other descriptor in complex hand sign as a feature. Currently system is
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working on static hand gestures, further it will be extended to dynamic hand gesture recognition for Indian sign language interpretation.

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Index Terms

Computer Science
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Keywords
Human Computer Interface(HCI) Fourier Descriptor(FD) 7 Hu moments Finger detection

Convex Hull.