Abstract

Gesture recognition is analyzed on a set of static hand gestures in the context of designing robust, real-time pre-processing techniques for applications in hand-held electronics. A comparative case study that uses various combinations of algorithms across the steps of the recognition process is made, revealing the fact that many method combinations can produce highly accurate results, even at low resolutions, given the right kind of pre-processing. The pre-processing includes the hand segmentation and normalization done before feature extraction. Indeed, pre-processing has by far the greatest effect on the overall accuracy, robustness, and speed of the gesture recognition process, significantly outweighing the influence of feature-extraction and classification. Even at image resolutions as low as 8x8 pixels, accuracies of 99% are achieved using a simple PCA feature selection scheme and a LDA classification method. These results suggest the priority and advantages of focusing on developing robust and efficient pre-processing methods.
Enhanced Gesture Recognition Performance through Improved Pre-Processing

- Marcel datasets. (http://www.idiap.ch/resource/gestures/).
- P. Dreuw. RWTH German Fingerspelling Database, 2005.
- Cambridge hand gesture datasets. (http://www. iis. ee. ic. ac. uk/tkkim/ges db. htm).

Index Terms

Computer Science Pattern Recognition
Enhanced Gesture Recognition Performance through Improved Pre-Processing

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Pre-processing  Hand  Gesture  Recognition