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Palmprint recognition method using WTA-ICA based on 2DPCA. (English) Zbl 1214.68328

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Summary: A novel palmprint recognition method using the algorithm of winner-take-all based Independent Component Analysis (WTA-ICA) based on two-dimensional Principle Component Analysis (2DPCA) is proposed in this paper. 2DPCA is used to reduce the dimensions of palmprint images by computing covariance matrix directly according to palmprint image matrix instead of not being transformed into vectors. Therefore, the computation complication of image data is highly reduced. WTA-ICA is in fact the algorithm of sparse ICA, which utilizes the l^{∞}norm as the independence and sparse measure criterion, and is simpler and faster under high dimensional computational requirements. Palmprint images are preprocessed by 2DPCA, and then using the WTA-ICA algorithm, the features of palmprint images can be extracted successfully. Furthermore, using classifiers, the task of palmprint recognition can be implemented. Moreover, compared our palmprint recognition method with PCA, 2DPCA and WTA-ICA, simulation results show further that this algorithm proposed in this paper has advantages over any one mentioned here.

For the entire collection see [Zbl 1200.68009].

MSC:

68T10 Pattern recognition, speech recognition

Keywords:

palmprint recognition; 2D-PCA; l^{∞} norm; WTA-ICA; classifier

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