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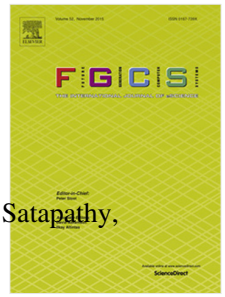

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Local Diagonal Extrema Number Pattern: A new Feature Descriptor for Face Recognition

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Abstract

This paper proposes a simple and novel feature descriptor for face recognition called local diagonal extrema number pattern (LDENP). LDENP produces a compact code of facial features which is obtained by encoding the directional information of the face image. Further, LDENP micro-patterns are created using values and indices of the local diagonal extremas (i.e. minima and maxima) using first order local diagonal derivatives that extract the directional information. Moreover, the proposed algorithm partitions the face into several regions to facilitate extraction of features from each region individually. Consequently, the extracted features are concatenated into a single feature vector which is used as a face descriptor. In this work, only the diagonal neighbours are considered, hence, the dimension of the feature, and the computation time to recognize the face are reduced. Therefore, the curse of dimensionality problem is solved. Experimental results are carried out on standard benchmark databases like FERET, Extended YALE-B, ORL and LFW-a. Moreover, efficiency of LDENP descriptor is asserted by comparing recognition rates of the proposed method with other existing local-descriptor based methods.

Keywords: Face recognition, Local features, Feature descriptor, Local directional pattern, Face descriptor, Local diagonal neighbours.

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