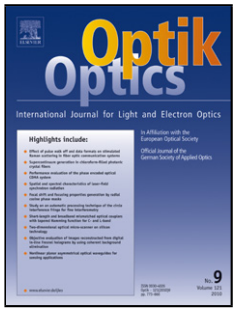

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Using Kernel Sparse Representation to Perform Coarse-to-Fine Recognition of Face Images

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Abstract

Feature space-based face recognition method performs representation and classification for face images in the feature space instead of the original space. This representation-based method uses kernel function to solve the feature space and therefore outperforms the method working in original space. A contemporary coarse-to-fine face recognition method also uses the idea of sparse representation but separates the classification into two stages from coarse candidate to fine classification. They both apply the sparse representation technique for image classification, but we believe that there is still space to improve the robustness of sparse representation in these methods. We proposed a novel method integrating both methods together to perform robust face image classification. This method also consists of two stages as sparse representation-based coarse-to-fine classification. In the first stage, however, the coarse candidate classes are determined in the feature space selected by the kernel function instead, which is the key technique used in the feature space-based method. And then in the next stage, fine classification is performed to assign the test sample into a class from candidate classes. The experimental results demonstrated that this novel integrated method outperforms both methods on prevailing benchmark facial datasets.

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