Improvement of the Constrained Mutual Subspace Method for Face Recognition

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Abstract

Constrained Mutual Subspace Method (CMSM) is a powerful face recognition method which is able to achieve high recognition accuracy. However, CMSM requires a large number of images from each subject to perform training and testing, and it suffers serious performance degradation when this condition is not satisfied. Furthermore, due to its performance is inherently relevant to the sequence order of reference subspace bases, its performance may be unexpectedly decreased if the sequence orders of subspace bases are not the same for its training and testing patterns of the same subject. This paper proposes two solutions to overcome the mentioned two difficulties. The first is to purposely generate more patterns from the existed patterns and the second is to produce different sequence orders for a same subspace bases. Experimental results on the famous Banca face database demonstrate the improved CMSM with the proposed solutions outperform the competitive methods such as the original CMSM and GDA (Generalized Discriminant Analysis).

Keyword：face recognition, CMSM, canonical angle