A Comparison of Trace Transform and PCA-based Approaches for Face Recognition on Large Face Databases

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Abstract

The problem of face recognition, especially under lighting, expression and head position variations, is an important task in computer vision. Many approaches exist in the literature, the reference method being the principal components analysis (PCA) approach. However, this approach is not invariant to head rotations and, to some extent, to illumination variations. A good way to obtain rotation invariant representations of an image is the Trace transform, which was also applied for face recognition, but only after a prior facial ellipse fitting to generate strictly the face image. In this paper, we examine the performance of a Trace transform based face recognition system, for various forms of the trace functional, and compare it with a PCA-based face recognition system on a standard face recognition database. Unlike the existing methods we do not apply any preprocessing of the face images prior to face recognition by Trace transform.