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Pseudo-Full-Space Representation Based Classification for Robust Face Recognition

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Abstract: Sparse representation based classification shows significant performance on face recognition (FR) when there are enough available training samples per subject. However, FR often suffers from insufficient training samples. To tackle this problem, a novel classification technique is presented based on utilizing existing available samples rather than constructing auxiliary training samples. An inverse projection-based pseudo-full-space representation (PFSR) is firstly proposed to stably and effectively exploit complementary information between samples. The representation ability of sparse representation-based methods is quantified by defining category concentration index. In order to match PFSR and complete classification, a simple classification criterion, category contribution rate, is designed. Extensive experimentations on the AR, Extended Yale B and CMU Multi-PIE databases demonstrate that PFSR-based classification method is competitive and robust for insufficient training samples FR problem.

Key words: sparse representation; pseudo-full-space representation; category concentration index; category contribution rate; face recognition

1. Introduction

Face recognition (FR) has been a well-studied problem despite its many inherent

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