

论文

基于优化的LDA算法人脸识别研究

庄哲民, 张阿妞, 李芬兰

汕头大学电子工程系 汕头 515063

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摘要

提取低维人脸特征是人脸识别系统中极其关键的一步。线性判别分析(LDA)是一种较为普遍的用于特征提取的线性分类方法。本文提出了一种优化的LDA算法,该方法克服了传统的LDA算法用于人脸识别时存在的问题:通过重新定义样本类间离散度矩阵使传统的Fisher准则能够最优化,克服了边缘类对选择最佳投影方向的影响;同时,利用因数分解的方法避免了对矩阵求逆,解决了小样本问题。依据经验选取适当的值,得到最佳的识别效果。实验结果表明,人脸识别效果优于传统LDA方法。

关键词 [线性判别分析\(LDA\)](#) [人脸识别](#) [类间离散度](#) [类内离散度](#) [特征提取](#)

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Based on an Optimized LDA Algorithm for Face Recognition

Zhuang Zhe-min, Zhang A-niu, Li Fen-lan

Department of Electronics, Shantou University, Shantou 515063, China

Abstract

Extracting the most discriminant low-dimensional face feature is an extremely critical step in Face Recognition (FR) systems. Linear Discriminant Analysis (LDA) is one of the most popular linear classification techniques for feature extraction. An optimized LDA algorithm is introduced to overcome questions existing in the traditional LDA algorithm for FR in this paper. The between-class scatter matrix is redefined in order to make the traditional Fisher criterion optimal and eliminate the effect that the edge of class has on selecting the optimal projection; at the same time, it avoids computing the inverse of matrix by means of factorization, and solves the Small Sample Size (SSS) problem. Adopting experiential method, the appropriate value of e is found, and then the optimal effect of face recognition is got. Experimental results show the recognition rate of this method is superior to the traditional LDA.

Key words [Linear Discriminant Analysis \(LDA\)](#) [Face recognition](#) [Between-class scatter](#) [Within-class scatter](#) [Feature extraction](#)

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通讯作者

作者个人主页 庄哲民; 张阿妞; 李芬兰

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