论文

利用小波变换提高基于KPCA方法的人脸识别性能

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摘要：

基于核主成分分析（KPCA）的人脸识别算法能够提取非线性图像特征，在小样本训练条件下有较好性能. 然而并非所有非线性特征对识别都有利，过多的不相关特征可能会降低识别性能. 针对图像信息冗余的特点，预先对图像进行小波变换，通过消除对识别无关的细节信息，不仅提高了KPCA方法的识别精度，而且降低了该算法对计算机硬件的要求. 同时，为了抑制KPCA对光照等变化的较高敏感性，还提出一种对图像灰度进行衰减的预处理策略. 基于ORL数据库的实验表明，综合上述措施的系统比传统方法具有更快的训练速度和更高的识别精度.

关键词： 人脸识别　小波变换　核主成分分析

Performance improvement of face recognition based on kernel principal component analysis using wavelet transform

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Abstract:

The algorithm of face recognition based on kernel principal component analysis（KPCA）can abstract nonlinear features of image and can get better performance under less sample training conditions. Not all nonlinear features are beneficial to the recognition. The superabundant unrelated features may reduce the recognition performance. The image was transformed by wavelet transformation for its redundancy, which not only has improved the accuracy of recognition but has reduced the demand for computer hardware of the algorithm. A pretreatment strategy that can reduce image gradation was developed in order to restrain upper sensitivity of KPCA to the change of illumination. The experimental results based on ORL-DATABASE show that the above-mentioned algorithm allows faster training speed and higher accuracy of recognition than traditional ones.

Keywords: face recognition　wavelet transform　kernel principal component analysis

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2. 万海平,何华灿 .基于谱图的维度约简及其应用[J]. 山东大学学报(理学版), 2006,41(3): 58-60

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