光子学报 2011, 40(4) 636-641 DOI: 10.3788/gzxb20114004.0636 ISSN: 1004-4213 CN: 61-1235/O4

论文

一种自适应的Gabor图像特征抽取和权重选择的人脸识别方法

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摘要:

为了克服光照、表情变化等因素对人脸识别的影响,本文提出了一种自适应的Gabor图像特征抽取和权重选择的人脸识别方法.该方法首先把每幅人脸图像经过Gabor小波变换后得到的40个不同尺度和方向下的图像都看作是独立的样本,再把不同人脸中的同一尺度和方向的变换结果进行特征重组,得到40个独立地新特征矩阵.为了增强对光照、表情变化的鲁棒性,每一新特征矩阵的识别贡献被本文所提出的自适应权重方法计算得到.其次,对每一新特征矩阵采用离散余弦变化进行降维,并采用了鉴别力量分析方法来选取最有鉴别力的离散余弦变换系数作为特征向量.最后,抽取线性鉴别分析特征进行识别.大量的实验证明了本文所提方法的有效性.

关键词: Gabor变换 自适应特征和权重选择 离散余弦变换 鉴别力量分析 人脸识别

An Adaptive Feature and Weight Selection Method Based on Gabor Image for Face Recognition

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Abstract:

To overcome the negative effect of factors such as illumination and expression on face recognition,an adaptive feature and weight selection method was proposed.The method was based on Gabor image for face recognition.Firstly,40 independent feature matrices which were reconstructed with the same scale and the same direction transform results of the different face images were obtained by regarding every Gabor wavelet transformed output image as an independent sample.In order to enhance the robustness to facial expression and illumination variations,the contribution of each new feature matrix could be adaptively computed by the proposed adaptive weight method.Secondly,after applying discrete cosine transform to each feature matrix,the coefficients which had more power to discriminate different classes than others were selected by discrimination power analysis to construct feature vectors.And,linear discriminant analysis features were extracted to fulfill recognition task.Experiments on the face databases demonstrate the effectiveness of the proposed method.

Keywords: Gabor transform Adaptive weight and feature selection Discrete Cosine Transform (DCT) Discrimination Power Analysis (DPA) Face recognition

收稿日期 2010-10-29 **修回日期** 2010-12-29 **网络版发布日期** 2011-04-25

DOI: 10.3788/gzxb20114004.0636

基金项目:

国家自然科学基金（No.60973098,No.60632050,No.60873151）资助

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