基于低秩矩阵恢复和 Gabor 特征的遮挡人脸识别

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摘　要：　针对低秩矩阵恢复算法复杂度过高和训练集样本存在遮挡的问题，本文提出一种基于低秩矩阵恢复和 Gabor 特征的鲁棒表示与分类的遮挡人脸识别方法.该方法首先通过快速低秩矩阵恢复算法，准确并且快速地求得训练样本图像对应的误差图像；然后，分别对“干净”人脸图像和遮挡误差图像进行 Gabor 变换，得到 Gabor 特征向量；接着，本文提出一种基于 Gabor 特征的遮挡字典压缩算法，可以计算出压缩后的 Gabor 遮挡字典，并用其与训练样本的 Gabor 特征向量构成 Gabor 压缩字典；最后，利用压缩字典对测试样本进行协作表示，获取最终的识别结果.在 Extended Yale B 和 AR 数据库上的实验结果表明，本方法不仅对遮挡人脸识别具有较强的鲁棒性，而且大大降低了对遮挡人脸图像编码的计算量，缩减了算法的运行时间.

关键词：　人脸识别；低秩矩阵恢复；Gabor 特征；字典压缩；协作表示

Occlusion face recognition based on low-rank matrix recovery and Gabor feature

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Abstract：　To solve the problem of low complexity of low-rank matrix recovery algorithm and occlusion of training set samples, this paper proposes an occlusion face recognition method based on low-rank matrix recovery and Gabor feature robust representation and classification. Firstly, the fast low-rank matrix recovery algorithm is used to accurately and quickly obtain the error image corresponding to the training sample image. Then, Gabor transform is performed on the “clean” face image and the occlusion error image respectively to obtain the Gabor feature vector. Then, In this paper, an occlusion dictionary compression algorithm based on Gabor feature is proposed. The compressed Gabor occlusion dictionary can be calculated and used to form a Gabor compression dictionary with Gabor feature vectors of training samples. Finally, the test samples are cooperatively represented by the compression dictionary. The final recognition result. The experimental results on Extended Yale B and AR database show that the proposed method not only has strong robustness to occlusion face recognition, but also greatly reduces the computational complexity of occlusion face image coding and reduces the running time of the algorithm.

Key words：　face recognition; low-rank matrix recovery; gabor feature; dictionary compression; collaboration representation

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