

摘要：针对掌纹识别时非接触信号采集可能出现的离焦状态会导致掌纹模糊，从而降低识别系统性能的问题，提出了一种基于稳定特征的模糊掌纹识别方法。建立了掌纹的离焦退化数学模型；在分析模糊机理的基础上，使用拉普拉斯平滑变换提取模糊掌纹的低频系数作为稳定特征，利用特征向量之间的欧式距离进行匹配和判别。文中给出了算法的步骤，并通过实验确定了需要选取的低频系数的个数。在建立的SUT-D模糊掌纹库上进行了识别测试，结果表明本文算法的等误率可达17.101 7%，与传统的DCT变换及Eigen Palm, Palm Code等8种典型识别方法比较，等误率最高可降低7.908 4%。这些结果显示本文方法不但能够提升识别效果，而且特征维数较低，改善了模糊掌纹识别系统的性能。

关键词：生物特征 掌纹识别 离焦 模糊 拉普拉斯平滑变换

Blurred palmprint recognition under defocus status

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Abstract: As the defocus status in non-contact signal acquisition for palmprint recognition might blur palmprint and degrade the performance of a recognition system, a novel scheme based on stable features was proposed for the blurred palmprint recognition. Firstly, a mathematical model of defocus degeneration was established. Then, the blur mechanism was analyzed in detail and the Laplacian Smoothing Transform (LST) was employed to extract low-frequency coefficients from blurred palmprint as stable features. Furthermore, the Euclidean distance between the feature vectors was used for matching and discriminating. With the experiments, the operation steps of the algorithm was given and the number of low-frequency coefficients were determined. The experiments based on the self-made SUT-D blurred palmprint database were performed. Obtained results show that the proposed algorithm can get Equal Error Rate (EER) of 17.1017%, which has been maximally reduced by 7.9084% compared with those from other typical recognition methods such as traditional Discrete Cosine Transform (DCT), Eigen Palm and the Palm Code. These results show that the proposed scheme not only has higher recognition efficiency but also has a low dimension, so it significantly improves the performance of the blurred palmprint recognition systems.

Keywords: biometric feature palmprint recognition defocus blurred recognition Laplacian Smoothing Transform (LST)

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