信号处理 2011, 27(9) 1423-1427 DOI: ISSN: 1003-0530 CN: 11-2406/TN

短文与研究通讯

基于8方向脊向滤波器的指纹预处理方案

王瑶, 喻建平, 刘宏伟, 张鹏

深圳大学ATR国防科技重点实验室

摘要：

在自动指纹识别系统中，对时间复杂度高的指纹图像预处理算法进行研究，为了有效地去除指纹图像中的噪声，提高识别速度以应用于实时系统，提出了一种基于8方向脊向滤波器的指纹预处理方案。该方案在求取点方向图时以方向逼近法为基础，引入均值滤波的思想以降低图像中噪声的影响，获取一致性更好、性能更稳定的点方向图；然后根据脊向滤波器的设计原理，优化设计了一组对应于指纹图像方向信息的8方向脊向滤波器模板；最后运用查表法，对于指纹图像中的每个像素点选取与其方向信息相应的滤波器模板进行图像增强。在FVC2004公布的指纹图像数据库DB1_B上，按照FVC2004测试标准所做的试验结果表明，本文所提方案简单快速有效，能够应用于实时的自动指纹识别系统。

关键词： 预处理算法 方向图 图像增强 8方向脊向滤波器

Fingerprint pre-processing scheme based on 8 directional ridge-direction filter

WANG Yao, YU Jian-Ping, LIU Hong-Wei, ZHANG Peng

ATR Key Laboratory of National Defense Technology, Shenzhen University

Abstract:

In order to get rid of the noise of fingerprint image effectively and cut down the time of identify so it can be used to the real-time system more appropriate, this paper proposed a fingerprint pre-processing scheme based on 8 directional ridge-direction filter, which based on the thorough study of the fingerprint image pre-processing algorithm which has the highest time complexity in Automatic Fingerprint Identification System(AFIS). This scheme based on direction approximation method while getting the point orientation map of fingerprint, employed the mean filter algorithm which can reduce the influence of fingerprint image noise, not only made the consistency of point orientation map better but also made the performance of results more stable. And then designed a suite of 8 directional ridge-direction filter which corresponding with the direction information of fingerprint image according to the design principles of ridge-direction filter. At last adopted the method of look-up to select ridge-direction filter corresponding with the fingerprint direction information of each pixel, to enhance fingerprint image. Experiments are done on the FVC2004 databases DB1_B with the FVC2004 performance evaluation method and the results show that our scheme is simply, quickly and efficiently that can be widely used in real-time Automatic Fingerprint Identification System(AFIS).

Keywords: fingerprint pre-processing algorithm orientation map image enhancement 8 directional ridge-direction filter

收稿日期 2011-06-01 修回日期 2011-07-11 网络版发布日期 2011-09-25

DOI:

基金项目:

高等学校博士学科点专项基金（2009440811001）

通讯作者:

作者简介:

作者Email:

参考文献：

本刊中的类似文章

文章评论

反馈人		邮箱地址	
反馈标题		验证码	5786