

论文

指纹及指静脉双模态识别的二级分类融合法研究

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摘要:

针对单模态生物特征识别系统固有的局限性, 提出一种基于二级分类的指纹与指静脉识别的决策级融合方法. 首先, 针对指纹和指静脉进行一级分类器设计, 得出各自的识别结果; 然后将这两种模态的特征点集以特征串联的方式形成新的特征矢量并构成第3个分类器进行二级分类, 得出识别结果; 最后将这3个识别结果进行决策级融合, 得到最终的识别结果. 实验结果表明, 该方法有效地克服了单模态识别方法的局限性, 提高了系统的性能.

关键词: 多模态生物特征识别; 指纹识别; 静脉识别; 二级分类

Research on dual-modal second-level decision fusion for fingerprint and finger vein recognition

Abstract:

In order to overcome the inherent limitations of single modal fingerprint and finger vein recognition systems, a second-level decision fusion algorithm based on fingerprint and finger vein dual-mode recognition is proposed. Firstly, two classifiers are designed for fingerprint and finger vein recognition respectively. Then extracted feature vectors from the first stage are then concatenated to make the third classifier for second-level decision. Finally, recognition is achieved by the fusion of the three classifiers' recognition results at the decision level. Experimental results show that this algorithm not only overcomes the limitations of single-modal biometrics, but also effectively improves the recognition performance of the system.

Keywords: multibiometric; fingerprint identification; finger vein identification; second-level classifier

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参考文献:

1 A. K. Jain, A. Ross, S. Pankanti, An introduction to biometric Recognition, IEEE Trans, Circuit and System for Video Technology, 2004, 14(1): 4-20. 2 R. Snelick, U. Uludag, A. Mink, M. Indovina, and A. K. Jain. Large Scale Evaluation of Multimodal Biometric Authentication Using State-of-the-Art Systems. IEEE Transactions on Pattern Analysis and Machine Intelligence, March 2005, 27(3): 450-455. 3 Liu C.J., Wechsler H.. A shape-and texture-based enhanced Fisher classifier for face recognition. IEEE

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Transactions on Image Processing, 2001, 10(4): 598-608. 4 Brunelli R, Falavigna D. Person identification using multiple cues. IEEE Transactions on Pattern Analysis and Machine Intelligence, 1995, 17(10): 985-966. 5 Bigun E S, Bigun I, D ue B, et al. Expert Conciliation for Multimodal Person Authentication Systems by Bayesian Statistics. In : Proc 1st Int. Conf on Audio Video-based Personal Authentication, Crans Montana, Switzerland. 1997, 03(1): 765-771. 6 LI Hong, A.K. Jain, "Integrating Faces and FingerPrints". IEEE Trans PAMI, 1998, 20(1): 1295-1307. 7 A.K. Jain, A. Ross, "Multibiometric Systems, Communication of the ACM, Special Issue on Multimodal Interfaces, 2004, 47(1): 34-40. 8 A. Kumar, D.C.M. Wong, H.C. Shen, A.K. Jain, "Personal Verification using PalmPrint and Hand Geometry Biometric", Proceedings of the fourth International Conference on audio- and video-based biometric Personal authentication, 2003, LNCS 2688: 668-678. 9 K.A. Toh, "Fingerprint and speaker verification decisions fusion", 12th International Conference on Image Analysis and Processing, 2003: 626-631. 10 A. Kale, A.K. Roychowdhury, R. Chellappa, "Fusion of Gait and Face for Human Identification", ICASSP'04, 2004: 901-904. 11 C. Chibelushi, F. Feravi, J.S.D. Mason, "A Review of Speech-Based Bimodal Recognition", IEEE Trans. on Multimedia, 2002, 4(1): 23-37. 12 C. Chen, C.T. Chu, "Fusion of Face and Iris Features for Multimodal Biometrics", International Conference on Biometric Authentication, Hong Kong, 2006, LNCS 3832: 571-580. 13 R.W. Frischholz, U. Dieckmann "BioID: A Multimodal Biometric Identification System", IEEE Trans. On Computer, 2000, 33(2): 64-68. 14 罗希平, 田捷. 自动指纹识别中的图像增强和细节匹配算法[J], 软件学报, 2002, 13(5): 946-956. Luo Xiping; Tian Jie, Image Enhancement and Minutia Matching Algorithms in Automated Fingerprint Identification System. [J] Journal of Software, 2002, 13(5): 946-956. (In Chinese) 15 李昊, 傅曦. 精通 Visual C++ 指纹模式识别系统算法及实现[M]. 北京: 人民邮电出版社, 2008: 88-93. Li Hao; Fu Xi. Master Visual C++ fingerprint recognition algorithm and implementation[M]. Beijing: Posts & Telecom Press, 2008: 88-93. (In Chinese). 16 Comparing Images Using the Hausdorff Distance, IEEE trans. on Pattern Analysis and Machine Intelligence, 1993: 322-328. 17 Dubuisson, M.P., and Jain, A.K.: A modified Hausdorff distance for object matching. Proc. 12th Int. Conf. on Pattern recognition, Jerusalem, Israel, 1994: 566 - 568.

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