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信息科学

基于统计特征中心对称局部二值模式的虹膜识别

李欢利^{1,2}, 郭立红^{1*}, 李小明³, 王心醉⁴, 董月芳⁴

1. 中国科学院 长春光学精密机械与物理研究所, 吉林 长春130033;
2. 中国科学院大学, 北京 100039; 3. 中国航空工业集团公司 洛阳光电设备研究所, 河南 洛阳 471023;
4. 苏州生物医学工程技术研究所, 江苏 苏州 215163

摘要: 由于中心对称局部二值模式(CS-LBP)的虹膜识别具有特征维数高、对噪声敏感等缺点,提出了基于统计特征中心对称局部二值模式(SCCS-LBP)的虹膜识别方法。首先,根据虹膜纹理的分布特性,用CS-LBP对归一化的虹膜图像进行编码;为了进一步降低特征维数,对编码后的图像进行特征统计。然后,根据统计结果的分布,提取出有效的二值特征图像。最后,用Hamming距离进行虹膜识别。对CASIA1.0、CASIA2.0、CASIA3.0-Interval、MMU1图像库进行了识别,最高正确识别率分别为99.955%、99.859%、99.989%、99.916%。实验结果表明:该方法有效地利用了虹膜纹理分布特性,与LBP和CS-LBP方法相比,具有更少的特征维数、更高的正确识别率和更好的鲁棒性。

关键词: 虹膜识别 中心对称局部二值模式(CS-LBP) 统计特征中心对称局部二值模式(SCCS-LBP) Hamming距离

Iris Recognition Based on SCS-LBP

LI Huan-Li^{1,2}, GUO LI-Hong^{1*}, LI Xiao-Ming³, WANG Xin-Zui⁴, DONG Yue-Fang⁴

1. Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Changchun 130033, China;
2. University of Chinese Academy of Sciences, Beijing 100039, China;
3. Luoyang Institute of Electro-optical Equipment of Aviation Industry Corporation of China, Luoyang 471023, China;
4. Suzhou Institute of Biomedical Engineering and Technology, Suzhou 215163, China

Abstract: As the Center-Symmetric Local Binary Pattern(CS-LBP) for the iris recognition has a higher feature dimension and is sensitive to noises, an effective improved method based on Statistical Characteristics Center-symmetric Local Binary Pattern(SCCS-LBP) was proposed. Firstly, a normalized iris image was encoded by CS-LBP according to the distribution characteristics of iris texture, and the statistical characteristics of the encoded image was computed to reduce the feature dimension. Then, the binary feature image of iris was extracted based on statistical results. Finally, the Hamming distance matching vector was obtained to implement the iris recognition. This method was used to CASIA1.0, CASIA2.0, CASIA3.0-Interval and MMU1 database, the results show that the highest correct recognition rates reach respectively 99.955%, 99.859%, 99.989%, and 99.916%. The experimental results demonstrate that this method effectively utilizes the iris texture distribution characteristics, and have the advantages of lower dimension, higher recognition rate and better robustness as compared with LBP and CS-LBP methods.

Keywords: iris recognition Center-symmetric Local Binary Pattern(CS-LBP) Statistical Characteristics Center-Symmetric Local Binary Pattern(SCCS-LBP) Hamming distance

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通讯作者: 李欢利

作者简介: 李欢利(1986-)女,河南洛阳人,博士,2008年于东北师范大学获得学士学位,主要从事计算机视觉、图像处理等方面的研究。
作者Email: lih1483@sina.com

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