1. 基于视频的人脸识别研究进展

<http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=4&recid=&filename=JSJX200905004&dbname=CJFD2009&dbcode=CJFQ&pr=&urlid=&yx=&v=MTA1NTVoVTczSUx6N0Jkckc0SHRqTXFvOUZZSVI4ZVgxTHV4WVM3RGgxVDNxVHJXTTFGckNVUkx5Zll1ZHBGeXY>=

近年来基于视频的人脸识别已成为人脸识别领域最为活跃的研究方向之一.如何充分利用视频中人脸的时间和空间信息克服视频中人脸分辨率低,尺度变化范围大,光照、姿态变化比较剧烈以及时常发生遮挡等困难是研究的重点.文中对近期(主要近5年)基于视频的人脸识别研究进行了详细的介绍和讨论,在对相关方法分类的基础上,分析了各类方法中典型技术的优缺点,并概况介绍了常用的视频人脸数据库和实验结果,最后展望了基于视频人脸识别未来的发展方向和趋势.

2.低分辨率人脸识别研究

http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=8&recid=&filename=1013342039.nh&dbname=CDFD1214&dbcode=CDFD&pr=&urlid=&yx=&v=MjA1ODBWRjI2SGJDOEhOSFBwcEViUElSOGVYMUx1eFlTN0RoMVQzcVRyV00xRnJDVVJMeWZZdWRwRnl2aFU3dkw=

经过四十多年的发展,人脸识别的各种算法层出不穷,从研究初期只针对单一简单背景发展到目前应对各种复杂条件,如姿态、光照、表情、噪声、遮挡、化妆、年龄、种族、性别等。尽管已有的人脸识别系统在特定约束环境下的正确识别率令人满意,但在实际环境尤其在视频监控应用中,由于监控对象的不配合及距离监控摄像头较远等问题引起图像质量较低,导致识别性能很不理想,我们把这种情形下的人脸识别统称为低分辨率人脸识别。本文针对远距离监控带来的人脸小尺寸和低质量问题,对低分辨率人脸识别算法进行系统研究,全面综述低分辨率人脸识别算法的研究现状与发展趋势,重点对分辨率稳健特征表达能力的局限性、高低分辨率统一特征空间表达能力的不足、人脸超分辨率增强与识别目标的不一致等三个关键问题进行深入研究,并提出若干新的模型和算法,为自动人脸识别系统走向实际应用提供理论依据和技术方法。

3.用于人脸识别的相对梯度直方图特征描述

http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=9&recid=&filename=GXJM201401023&dbname=CJFD2014&dbcode=CJFQ&pr=&urlid=&yx=&v=MzIyNzBkcEZ5dmhVYnpMSWpYQlk3RzRIOVhNcm85SFo0UjhlWDFMdXhZUzdEaDFUM3FUcldNMUZyQ1VSTHlmWXU=

由于方向边缘幅值模式(POEM)在剧烈光照变化情况下无法获得足够的特征描述信息,本文分析了相对梯度幅值图像特点,提出了相对梯度直方图特征描述方法。该方法根据图像的梯度方向对相对梯度幅值图像进行分解、滤波、局部二值模式编码和特征降维,形成了对光照变化,尤其是非均匀光照变化具有健壮性的低维直方图特征。在FERET和YaleB子集上的人脸识别实验证实:在光照变化较小时,相对梯度直方图特征描述方法与方向边缘幅值模式的性能相当,均显著优于经典的局部二值模式特征;在光照剧烈变化时,前者的识别精度比方向边缘幅值模式至少高5%,性能显著优于方向边缘幅值模式和局部二值模式,展示了相对梯度直方图特征描述方法的有效性和对光照变化的良好健壮性。

4.人脸识别方法综述

http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=12&recid=&filename=JSYJ200909004&dbname=CJFD2009&dbcode=CJFQ&pr=&urlid=&yx=&v=MDE3NjNMdXhZUzdEaDFUM3FUcldNMUZyQ1VSTHlmWXVkcEZ5dmhWcjdCTHo3U1pMRzRIdGpNcG85RllJUjhlWDE=

 对一系列人脸识别方法进行了综合性描述。首先介绍了人脸识别的概念及其发展历史,指出了人脸识别所面临的主要困难;随后对人脸识别技术方法发展过程中一些经典的流行的方法进行了比较详细的阐述。最后介绍了人脸识别技术在国内外的应用状况。

5.基于局部相对纹理表示的光照变化人脸识别算法

<http://www.cnki.net/KCMS/detail/36.1137.TP.20160121.1655.036.html>

针对基于局部纹理的人脸表示不能较好解决不同光照条件下低分辨率人脸图像识别的问题，提出一种新的相位纹理表示法。该算法在局部邻域使用傅里叶变换相位的四象限掩码，减少来自更高幅值响应的滤波器中的错误滤波响应影响，从而产生更具判别性的代码滤波响应，相比局部相位量化(Local Phase Quantization, LPQ)受噪声影响大、量化离散效应等影响，相位纹理表示法更加有效和稳定。在CMU PIE、扩展YALE B和AR人脸数据库上的实验结果表明，本算法比局部相位量化更具描述性，识别率比LPQ和广泛使用的LBP(Local Binary Pattern, LBP)和方向梯度直方图(Histogram of Oriented Gradients, HOG)均有较大幅度的提高，对于增强光照条件，识别率增益小于1%，对光照变化的鲁棒性优于其他3种算法。

6.视频人脸识别实验平台的设计与实现

<http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=64&recid=&filename=SYJL201603041&dbname=CJFDTEMP&dbcode=CJFQ&pr=&urlid=&yx=&v=MjgyOTdXTTFGckNVUkx5Zll1ZHBGeXZoVzd2T05qVEJZckc0SDlmTXJJOUJaWVI4ZVgxTHV4WVM3RGgxVDNxVHI>=

 在VS2010编程环境下,结合OpenCV视觉库设计并完成了一个人脸识别实验平台。首先检测图像中的人脸区域,然后通过子空间法将其映射到新的特征空间提取特征,最后使用支持向量机实现分类识别。该实验平台可完成人脸检测、人脸识别功能,并实现了人脸数据库的创建、修改以及查询。在此实验平台上对ORL人脸数据库和实际创建的数据库进行实验,实验结果证明了视频人脸识别实验平台的有效性。

7.纹理与边缘相结合的单样本人脸识别

<http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=92&recid=&filename=JSGG201607035&dbname=CJFDTEMP&dbcode=CJFQ&pr=&urlid=&yx=&v=MTAyMDI3TWFiRzRIOWZNcUk5R1lZUjhlWDFMdXhZUzdEaDFUM3FUcldNMUZyQ1VSTHlmWXVkcEZ5cmtXcnJKTHo>=

针对传统人脸识别方法在单样本条件下受姿态、表情、遮挡和光照影响识别效果不佳等问题,提出一种改进的纹理特征和边缘特征相结合的人脸描述算子ε-WLBD(ε-Weber Local Binary Descriptor)。先用改进的局部二值模式和改进的Kirsch算子进行纹理特征和边缘特征提取,然后分别进行直方图统计,并将其串接起来作为人脸识别的总体特征向量,最后利用最近邻算法进行分类识别。在YALE和AR人脸库上进行测试,实验结果表明所提方法简单有效,且对姿态、表情、遮挡和光照等变化具有较强鲁棒性,对单样本人脸描述具有较好的效果。

8、基于嵌入式平台和OPENCV的人脸识别系统设计

<http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=125&recid=&filename=DNZS201604081&dbname=CJFDTEMP&dbcode=CJFQ&pr=&urlid=&yx=&v=MDQ5NDBlWDFMdXhZUzdEaDFUM3FUcldNMUZyQ1VSTHlmWXVkcEZ5cmxVN3JJSVNQUmZiRzRIOWZNcTQ5TlpZUjg>=

该文设计了一种基于嵌入式平台的人脸识别系统,该系统采用S3C2440A作为微处理器,以嵌入式Linux为操作系统,QT为界面编辑语言,对摄像头采集的图像进行分析处理。通过移植Open CV视觉函数库,调用PCA算法的相关库函数完成人脸图像的检测与识别。具有较强的实用价值。

9.基于分块LBP和鲁棒核编码的人脸识别

<http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=147&recid=&filename=DSSS201602025&dbname=CJFDTEMP&dbcode=CJFQ&pr=&urlid=&yx=&v=MTk2Mjk5Zk1yWTlIWVlSOGVYMUx1eFlTN0RoMVQzcVRyV00xRnJDVVJMeWZZdWRwRnlybFVMck9JVDdZZmJHNEg>=

针对人脸识别中的遮挡和姿态偏转等问题,提出了一种基于分块LBP和鲁棒核编码(Robust Kernel Coding,RKC)的人脸识别算法,简称LBP-RKC算法。该算法首先对人脸图像进行多级分块的LBP特征提取,得到图像的每一块统计直方图特征。然后,将特征投影到核空间中,在核空间中建立一个鲁棒的回归模型来处理图像中的异常值,并利用迭代重加权算法求解该模型。最后,计算测试样本的每一块核表示重构残差并进行分类识别。实验表明,提出的LBP-RKC算法在处理遮挡、姿态偏转等人脸问题时能取得很好的识别效果,同时算法效率较高。

10.基于Android的人脸识别系统设计与实现

<http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=269&recid=&filename=RJDK201604030&dbname=CJFDTEMP&dbcode=CJFQ&pr=&urlid=&yx=&v=MTMwMjJmUFpiRzRIOWZNcTQ5R1pJUjhlWDFMdXhZUzdEaDFUM3FUcldNMUZyQ1VSTHlmWXVkcEZ5cm1WcnpNTnk>=

人脸识别是公共安全领域的研究重点。随着移动互联网的快速发展,移动式终端人脸识别应用日益广泛。探讨人脸识别在Android系统中的实现以及用户个人信息保护,包括人脸检测、特征提取和特征识别。首先,通过分析比较,采用基于Adaboost的算法检测人脸,基于PCA的特征脸算法实现特征提取和特征识别。然后,分析相关研究现状以及技术可行性,选择OpenCV计算机视觉库来实现人脸检测和人脸识别。最后,通过JNI调用本地OpenCV代码实现个人信息保护。该系统具备手机人脸解锁、程序锁、偷窥者记录查询和远程查看偷窥者信息等功能。

11.基于视频流的人脸检测与跟踪关键技术研究

<http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=291&recid=&filename=DNZS201601087&dbname=CJFDTEMP&dbcode=CJFQ&pr=&urlid=&yx=&v=MTM4MjlEaDFUM3FUcldNMUZyQ1VSTHlmWXVkcEZ5cm1WNzNKSVNQUmZiRzRIOWZNcm85Tlk0UjhlWDFMdXhZUzc>=

本文研究了adaboost人脸检测算法在视频流中进行特征选择和分类器训练的原理,提出将积分图像的概念引入用于快速计算Haar-like~[1]特征值,简化人脸像素值计算,将haar-like特征值计算结果作为adaboost算法的输入样本分类检测人脸信息。利用camshift运动跟踪算法进行人脸跟踪定位,并利用opencv计算机视觉类库基于上述算法开发人脸检测跟踪系统。

12.基于LBP的图集人脸识别算法

<http://www.cnki.net/KCMS/detail/detail.aspx?QueryID=0&CurRec=425&recid=&filename=DBSZ201504018&dbname=CJFDLAST2016&dbcode=CJFQ&pr=&urlid=&yx=&v=MDAwNTN5M2tVN3pBSVMvWWRMRzRIOVRNcTQ5RWJJUjhlWDFMdXhZUzdEaDFUM3FUcldNMUZyQ1VSTHlmWXVkcEY>=

针对基于仿射包的图像集人脸识别方法(AHISD)对于离散数据的敏感性,提出了一种加入LBP的方法.通过LBP的方法对图像进行特征提取,然后再将图像集用仿射包进行建模,在此基础上,通过计算2个模型之间的距离,以达到对人脸进行鉴别和分类的效果.用LBP方法视频数据库(Honda/UCSD)给出了检测结果,有效地提高了识别率.

13.Face tracking and recognition with visual constraints in real-world videos

<http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=4587572&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxpls%2Fabs_all.jsp%3Farnumber%3D4587572>

We address the problem of tracking and recognizing faces in real-world, noisy videos. We track faces using a tracker that adaptively builds a target model reflecting changes in appearance, typical of a video setting. However, adaptive appearance trackers often suffer from drift, a gradual adaptation of the tracker to non-targets. To alleviate this problem, our tracker introduces visual constraints using a combination of generative and discriminative models in a particle filtering framework. The generative term conforms the particles to the space of generic face poses while the discriminative one ensures rejection of poorly aligned targets. This leads to a tracker that significantly improves robustness against abrupt appearance changes and occlusions, critical for the subsequent recognition phase. Identity of the tracked subject is established by fusing pose-discriminant and person-discriminant features over the duration of a video sequence. This leads to a robust video-based face recognizer with state-of-the-art recognition performance. We test the quality of tracking and face recognition on real-world noisy videos from YouTube as well as the standard Honda/UCSD database. Our approach produces successful face tracking results on over 80% of all videos without video or person-specific parameter tuning. The good tracking performance induces similarly high recognition rates: 100% on Honda/UCSD and over 70% on the YouTube set containing 35 celebrities in 1500 sequences.

14.An Introduction to Face Recognition Technology

<http://inform.nu/Articles/Vol3/v3n1p01-07.pdf>

Recently face recognition is attracting much attention in the society of network multimedia information access. Areas such as network security, content indexing and retrieval, and video compression benefits from face recognition technology because "people" are the center of attention in a lot of video. Network access control via face recognition not only makes hackers virtually impossible to steal one's "password", but also increases the user-friendliness in human-computer interaction. Indexing and/or retrieving video data based on the appearances of particular persons will be useful for users such as news reporters, political scientists, and moviegoers. For the applications of videophone and teleconferencing, the assistance of face recognition also provides a more efficient coding scheme. In this paper, we give an introductory course of this new information processing technology. The paper shows the readers the generic framework for the face recognition system, and the variants that are frequently encountered by the face recognizer. Several famous face recognition algorithms, such as eigenfaces and neural networks, will also be explained.

15.Toward automation of learning: the state self-organization problem for a face recognizer

<http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=670979&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxpls%2Fabs_all.jsp%3Farnumber%3D670979>

The capability of recognition is critical in learning but variation of sensory input makes recognition a very challenging task. The current technology in computer vision and pattern recognition requires humans to collect images, store images, segment images for computers and train computer recognition systems using these images. It is unlikely that such a manual labor process can meet the demands of many challenging recognition tasks that are critical for generating intelligent behavior, such as face recognition, object recognition and speech recognition. Our goal is to enable machines to learn directly from sensory input streams while interacting with the environment including human teachers. While doing so, the human teacher is not allowed to dictate the internal state value of the system. He or she can influence the system through only the system's sensors and effectors. Such a capability requires a fundamentally new way of addressing the learning problem, one that unifies learning and performance phases and requires a systematic self-organization capability. This paper concentrates on the state self-organization problem. We apply the method to autonomous face recognition