Through a dispersed network of cameras, face recognition of video surveillance tries to precisely identify the presence of a target person. 1) Still-to-video face recognition(e.g. watch-list screening) and 2)video-to-video face recognition are two popular forms of these applications (e.g. face re-identification) [5]. Low resolution (LR) and high noise, fluctuations in numerous angles and distances, and fluctuating lighting conditions provide difficulties in video surveillance. To match high-resolution (HR) photographs with low-resolution (LR) images in surveillance films, a novel face recognition method for low-resolution cameras is proposed in [A]. [F] created a reliable real-time face recognition technique that enhances photos and finds faces in movies using super-resolution. [K] introduces a novel feature descriptor and classification scheme for recognizing the face from low quality videos, which uses Fractional Krill-Lion Algorithm Based Actor Critic Neural Network. [L] employs multi-resolution convolutional neural networks and anti-aliasing techniques to address the low-resolution issue.

Face recognition systems that perform well in controlled scenarios do not perform satisfactorily in uncontrolled scenarios due to the differences between the source and target domains. The majority of current face recognition in the video surveillance industry uses a closed-set format where only the identity of previously registered objects is recognized. As a result, open-set techniques to face recognition in video surveillance have become more popular [6]. These approaches include multi-class classification and rejection procedures. In order to address the issue of open-set single-sample face recognition in a practical video surveillance scenario, [B] suggests using a fuzzy ARTMAP neural network, which can identify faces in near-frontal views under diverse lighting and facial expression conditions. [D] proposed an automatic pose normalisation technique without model fitting and human intervention, which greatly improves the performance of open-set single-sample face recognition methods in surveillance environments.

Main categories of face recognition methods are conventional and deep learning methods. Conventional methods rely on manual feature extraction techniques and pre-trained classifiers and fusion, while deep learning methods use large amounts of data to automatically learn features and classifiers through convolutional neural networks and non-linear feature mapping. The Haar Cascade, Geometry contour generation and matching, Histograms of Oriented Gradients, Back-Propagation Artificial Neural Network (BP-ANN), and Convolutional Neural Network are a few of the well-known face recognition algorithms[7]. [H] introduced the RFR-DLVT hybrid technique based on Deep Learning (DL) and visual tracking (FR).In [C], an optimal feature extraction technique is used to present a framework for face detection and recognition. Key frame extraction with wavelet information is a method for extracting key frames from face images. Following the extraction of the key frames, feature extraction is performed using multi-angle motion features, SURF features, full entropy, and appearance features. Finally, recognition using an optimal deep neural network based on a gravitational search algorithm is possible. Recent studies have shown that in recognition models, patch-attention is strictly more effective than convolution. In [J], a Patch-Attention Generative Adversarial Network (PA-GAN) model is created to aggregate some strong characteristics on behalf of a collection of unprocessed surveillance frames, which not only improves the face matching accuracy but also lowers the computational expenses.

With the development of artificial intelligence technology, AI face recognition technology combined with surveillance camera technology has become an important means to obtain effective information and improve analysis efficiency for mega-city governance. The problem of privacy leakage while applying it on a large scale has caused widespread concern, and this paper attempts to address the problem from the perspective of human-like cognition.

通过分散的摄像机网络，视频监控的人脸识别试图精确识别目标人物的存在。1）静态到视频的人脸识别（如监视名单筛选）和2）视频到视频的人脸识别是这些应用的两种流行形式（如人脸重新识别）[5]。在视频监控中，低分辨率（LR）和高噪音、多角度和多距离的变化以及不同的光照条件都存在挑战。[A] 提出了一种适用于低分辨率监控摄像机的新型人脸识别方法，采取了一种端到端的方法来匹配监控视频中的高分辨率（HR）图像和低分辨率（LR）图像。[F] develops a robust real-time face recognition approach that uses super-resolution to improve images and detect faces in the video. The presented approach improves descriptor count of the image based on the super-resolved faces and mitigates the effect of noise. Furthermore, it uses a parallel architecture to implement a super-resolution algorithm and overcomes the efficiency drawback increasing face recognition performance.[F]开发了一种稳健的实时人脸识别方法，该方法使用超分辨率来改善图像并检测视频中的人脸。所提出的方法在超分辨率人脸的基础上提高了图像的描述符数量，并减轻了噪声的影响。此外，它使用并行架构来实现超分辨率算法，并克服了效率方面的缺陷，提高了人脸识别性能。[K] introduces a novel feature descriptor and classification scheme for recognizing the face from low quality videos, which uses Fractional Krill-Lion Algorithm Based Actor Critic Neural Network. 本文介绍了一种新的特征描述符和分类方案，用于从低质量视频中识别人脸。基于克里尔-狮子算法的演员评论神经网络。[L]使用多分辨率卷积神经网络和抗锯齿方法来解决低分辨率问题。

由于源域和目标域之间的差异，在受控场景中表现良好的人脸识别系统在非受控场景中的表现并不令人满意。目前视频监控行业中的大多数人脸识别都使用封闭集格式，只识别以前注册的对象的身份。因此，视频监控中的人脸识别的开放集技术已经变得更加流行[6]。这些方法包括多类分类和拒绝程序。[B] proposes to use fuzzy ARTMAP neural network to solve the problem of open-set single-sample face recognition in real-world video surveillance scenario. Our proposed approach can recognize faces in near-frontal views under various illumination and facial expression conditions. 在本文中，我们提出使用模糊ARTMAP神经网络来解决现实世界视频监控场景中的开放集单样本人脸识别问题。我们提出的方法可以在不同的光照和面部表情条件下识别近前视的人脸。[D]提出了一种无需模型拟合和人工干预的自动姿势归一化技术，大大改善了在监控环境中的开放集单样本人脸识别方法的性能。

人脸识别方法的主要类别是传统方法和深度学习方法。传统方法依赖于人工特征提取技术和预训练的分类器和融合，而深度学习方法通过卷积神经网络和非线性特征映射，利用大量的数据自动学习特征和分类器。哈尔级联、几何轮廓生成和匹配、定向梯度直方图、反向传播人工神经网络（BP-ANN）和卷积神经网络是几个著名的人脸识别算法[7]。在[C]中提出了一个有效的人脸检测和识别框架，采用最佳的特征提取方法，首先，使用一种被称为使用小波信息的关键帧提取的策略来提取人脸图片的关键帧；在提取关键帧后，多角度运动特征、SURF特征、全熵和外观特征被用于特征提取；最后，可以使用基于引力搜索算法的最优深度神经网络进行识别。

[H] proposed a hybrid method based on Deep Learning (DL) and visual tracking, RFR-DLVT, to achieve effective face recognition (FR). 在本文中，我们提出了一种基于深度学习（DL）和视觉跟踪的混合方法RFR-DLVT，以实现有效的人脸识别（FR）。

Face recognition in unconstraint surveillance is a complicated problem on account of motion blur, expression variations and low resolution. Recent works have demonstrated that patch-attention is strictly more powerful than convolution in recognition models. In[J],a Patch-Attention Generative Adversarial Network (PA-GAN) model is devised to aggregate some robust features on behalf of a set of raw surveillance frames, which not only increases the recognition accuracy but also reduces the computational costs of face matching. 由于运动模糊、表情变化和低分辨率，无约束监控中的人脸识别是一个复杂的问题。最近的研究表明，在识别模型中，斑点关注严格来说比卷积更强大。设计了一个补丁关注生成对抗网络（PA-GAN）模型来代表一组原始监控帧聚集一些健壮的特征，这不仅提高了识别精度，也降低了人脸匹配的计算成本。

随着人工智能技术的发展，人工智能人脸识别技术与监控摄像技术相结合，已成为特大型城市治理中获取有效信息、提高分析效率的重要手段。在大规模应用的同时，隐私泄露的问题引起了人们的广泛关注，本文试图从类人认知的角度来解决这个问题。

[A]Face Recognition in Low-Resolution Surveillance Video Streams

[B] Open-set single-sample face recognition in video surveillance using fuzzy ARTMAP

[C] Gravitational search-based optimal deep neural network for occluded face recognition system in videos

[D] Automatic pose normalization for open-set single-sample face recognition in video surveillance

[F] Towards a super-resolution based approach for improved face recognition in low resolution environment

[H] RFR-DLVT: a hybrid method for real-time face recognition using deep learning and visual tracking

[J] PA-GAN: A Patch-Attention Based Aggregation Network for Face Recognition in Surveillance

[K] Fractional Krill-Lion Algorithm Based Actor Critic Neural Network for Face Recognition in Real Time Surveillance Videos

[L] Face Recognition on Low-Resolution Image using Multi Resolution Convolution Neural Network and Antialiasing Method