

Comparative Analysis of Deep Learning Models for an Automated Video Surveillance System

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Abstract

Intelligent Video Surveillance (IVS) systems plays an important role in ensuring public safety and security. Traditional surveillance methods depend mostly on manual monitoring. As a result, the process can be cumbersome and prone to error. With the advent of deep learning and image processing techniques, surveillance systems have become more accurate, autonomous, and context-aware. This survey paper provides a comprehensive review based on experiments of deep-learning based methods used for human detection, face detection, feature extraction and recognition. We have proposed an automated Video Surveillance system that will detect people and identify them from CCTV footage. Various models have been compared and benchmarked each for object detection (YOLO, SSD, Faster R-CNN, and Mask R-CNN), face detection (HOG, MTCNN, Haar Cascade, and RetinaFace), and face recognition (ResNet34, FaceNet, ArcFace, and InceptionResnetV1-VGGFace2). This paper also highlights current challenges and outlines future directions for building robust surveillance systems.

Keywords

Intelligent Surveillance System, Object detection, Face detection, Face recognition, YOLO, HOG, Resnet-34.