

A Survey on Deep Learning Approach for Suspicious Activity Detection from Surveillance Video

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Abstract: *Suspicious Activity is predicting the body part or joint locations of a person from an image or a video. This project will entail detecting suspicious human Activity from surveillance video using neural networks. It is important because of the sheet number of applications which can benefit from Activity detection. For example, human pose estimation is used in applications including video surveillance, animal tracking and behavior understanding, computer interaction. Suspicious human activity recognition from surveillance video is an active research area of image processing and computer vision. Through the visual surveillance, human activities can be monitored in sensitive and public areas such as bus stations, railway stations, airports, banks, shopping malls, school and colleges, parking lots, roads, etc. to prevent terrorism, theft, accidents and illegal parking, vandalism, fighting, crime and other suspicious activities. It is very difficult to watch public places continuously, therefore an intelligent video surveillance is required that can monitor the human activities in real-time and categorize them as usual and unusual activities; and can generate an alert.*

Keywords: Video Surveillance, Suspicious Activity, neural networks

I. INTRODUCTION

Human behavior identification in the real-world environment finds plenty of applications including intelligent video monitoring and shopping behavior analysis. Video surveillance has huge application areas especially in every places. Surveillance is an integral part of security. It gives CCTV Cameras the ability to detect suspicious activity, without human intervention. The main Moto of this paper is to identify suspicious activity for surveillance and alert the owners when suspicious activity is detected. Today world security camera becomes need for life for the safety and security purposes. E-surveillance is one of the main agendas in Digital India, development program of Indian government.

II. MOTIVATION

Human suspicious activity is one of the crucial problems in computer vision that has been studied for further than 15 times. It's important because of the sheer number of operations which can profit from suspicious activity. For illustration, human suspicious activity is used in operations including videotape surveillance, creature shadowing and geste understanding, subscribe language discovery advanced human-computer commerce, and marker less stir capturing. Low cost depth detectors have limitations like limited to inner use, and their low resolution and noisy depth information make it delicate to estimate human acts from depth images. That's why plan to use neural networks to overcome these problems. Suspicious human exertion recognition from surveillance videotape is an active exploration area of image processing and computer vision. Through the visual surveillance, mortal conditioning can be covered in sensitive and public areas similar as machine stations, road stations, airfields, banks, shopping boardwalks, academy and organizations, parking lots, roads, etc. to help terrorism, theft, accidents and illegal parking, vandalization, fighting, chain swiping, crime and other suspicious conditioning. It's veritably delicate to watch public places continuously, thus an intelligent videotape surveillance is needed that can cover the human conditioning in real- time and classify them as usual and unusual conditioning; and can generate an alert.

III. LITERATURE SURVEY

Paper name: Suspicious Activity Detection in Surveillance Footage

Author name Satyajit Loganathan, Gayashan Kariyawasam

Abstract: Suspicious activities are of a problem when it comes to the possible risk it brings to humans. With the increase in illegal activities in national and suburban areas, it's necessary to determine them to be suitable to minimize similar events. Early days surveillance was done manually by humans and where a tiring task as suspicious activities were uncommon compared to the usual activities. Paper name Suspicious Activity Detection from Videos using YOLOv3

Author name Nipunjita Bordoloi; Anjan Kumar Talukdar; Kandarpa Kumar Sharma

Abstract: Human activity detection for video system is an self-acting way of processing video sequences and making an intelligent decision about the actions in the video. It's one of the growing areas in Computer Vision and Artificial Intelligence. Suspicious activity detection is the process of detecting unwanted human activities in places and situations. This is done by converting video into frames and analyzing the activities of persons from the reused frames. Detection of Suspicious Activity and Estimate of Risk from Human Behavior shot by Surveillance Camera Authors Miwa Takai

Abstract: In these days, surveillance camera system prevails as a security system at high speed because this system can cover from remote places using Web camera attached to video observer by network. Also, digital stuff similar as Web camera, and hard part drive are mass- produced, and are put up at low price. And, performance gain of these digital stuff improves at a rapid-fire rate. Current surveillance camera system shows dynamic images from some oversight areas shot by multiple Web cameras at the same time. Also, this system makes viewer's mind and body tired because he/she has to watch enormous number of dynamic images been constantly modernized. Also, this system has a serious problem, which is a viewer slips over predictor of crime. Crowd consistence Anal

Abstract: This is not just important for the convenience of the people but also for their security. Understanding a video footage and classifying an activity as normal or suspicious especially in densely packed regions is possible and has been demonstrated in this paper. The proposed system makes use of the YOLOv3 algorithm for object detection. First the features are computed from the image. Then based on the detected features, the classifier makes a prediction. Depending on the object detected, the algorithm classifies a frame as suspicious or normal. Crowd density has been calculated by detecting the number of people in a frame and suspicion detection has been performed by analysing a frame for suspicious objects like isolated bags, knives and guns.

3.1 Algorithm

A Convolutional Neural Network (ConvNet/ CNN) is a Deep Learning algorithm which can take in an input video, assign significance (learnable weights and impulses) to varied aspects/ objects in the video and be suitable to separate one from the other. The pre-processing needed in a ConvNet is much lower as compared to other classification algorithms. While in primitive ways filters are hand- manipulated, with enough training, ConvNet have the capability to learn these filters/ characteristics. fundamental result approach towards anomaly detection Preprocessing Preprocessing is an early step during video processing. Pre processing is applied to the extracted frames from the video to improve the quality of the frames because frames might have lot of noise or variation or sometimes low illumination or due to detector problem during video capturing. Feature detection and extraction In pattern recognition and image understanding feature detection means ways of finding some crucial points or interest points that can define the image content like edges, corners, texture and blobs etc. Feature extraction is simply a dimensionality reduction way in which large data is reduced in less features called feature vectors because large input volume have more data but lower information. So there's a need to convert large volume data into some set of features. Now selection of right feature is an important task in order to break critical problem. Classification Classification is the process of dividing the pattern into classes. This process categorizes the input data into the number of classes. This is generally used to classify the recently tested data into the class labels based upon the learned model. Finding normal and abnormal event is generally a two class problem.

**VI. CONCLUSION**

In present world, almost all the people are aware of the importance of CCTV footages, but most of the cases these footages are being used for the investigation purposes after a crime/incident have been happened. • The proposed model has the benefit of stopping the crime before it happens. The real time CCTV footages are being tracked and analyzed. • The result of the analysis is a command to the respective authority to take an action if in case the result indicates an untoward incident is going to happen. Hence this can be stopped.

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