MASS GATHERING USING DEEP LEARNING

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Abstract- Recognition of objects handled by humans is an important yet challenging research topic in the computer vision community. In this project, we propose context features along with a deep model to recognize the individual subject in the videos of real-world scenes. Besides the motion features of the subject, we also utilize context information from multiple sources to improve the recognition performance. We introduce the scene context features that describe the environment of the subject at global and local levels. This Project provides a deep learning based suspicious object monitoring and detection technique that can be implemented in surveillance cameras. This project proposes a system that uses Support Vector Machine (SVM) classifier to detect the objects and classify it as suspicious and normal. This system detects the presence of gun, knife, bottles and stick in live video streaming. It will alert the human operator or concerned authority who will take appropriate action by sending mail using IMAP protocol when suspicious activity is detected. We also show that our approach outperforms state-of-the-art methods on 5-activities and 6-activities versions of the Collective Activities Dataset. Thus our system ensures real-time public safety in public gathering effectively.

Keywords-*Deep Learning,IMAP Protocol.SVM classifier.*

I. INTRODUCTION

Detecting suspicious objects in crowded places is very important as it can help us in preventing many of the criminal activities. This can be done by using video analytics. Video analytics can be used in person identification, activity recognition, counting objects and people, etc. Suspicious activities are the unwanted activities performed by humans in certain places. Example for such activity includes handling harmful weapons like gun knife, stick and bottles etc., such unwanted activities can be detected by analyzing the behavior of the person. This project talks about the detection of the suspicious activities and harmful objects by analyzing the frames from the video input. First of all, the video has to be converted into frames and stored. These frames must be preprocessed to remove the noise in the frames. After preprocessing, the area of interest has to be subtracted from its background. This can be done by detecting the edges of the objects of interest and subtracting it from the background. After background elimination the image must be post processed to remove the noises in it. After noise removal the algorithm for object detection has to be used to detect the objects in the image. Then, the objects in the image have to be classified as harmful or normal by comparing with the images in database. This can be done by matching the pattern with the database that consists of numerous images with harmful and normal objects. If the detected is found to be suspicious, the concerned higher officials must be alerted and the details of the objects detected in the image must be sent to them.

Suspicious object recognition from surveillance video is an active research area of image processing and computer vision. Through the visual surveillance, harmful objects 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. It is very difficult to watch public places continuously, therefore an intelligent video

surveillance is required that can monitor the human activities and objects handled by them and categorize them as harmful and normal objects; and can generate an alert.

II. LITERATURE REVIEW

Regarding the terminology, Elliott has recently defined an intelligent video system (IVS) as "any video surveillance solution that utilizes technology to automatically, without human intervention, process, manipulate and/or perform actions to or because of either the live or stored video images".

Video surveillance systems have been used for various applications, such as traffic monitoring, security, post-incident analysis, etc. IVS embeds computer vision technologies into video devices such as cameras, encoders, routers, digital video recorders, network video recorders, and other video management and storage devices.

In this work, authors propose another technique for the detection and tracking of multiple human objects in the video. The solution includes the classifier based on Haar-like features for object detection and particle filter for tracking. According to the experimental results, proposed technique has good performance in the presence of poor lighting conditions, variation of human objects in poses, shape, size, clothing etc. It handles varying in time number of people.

III. EXISTING SYSTEM

The existing method used SURF (Speed up Robust Features) to extract interest points, and use SURF method to match and find the corresponding features.It used some algorithms to classify the suspicious activities. It also uses Viola Jones object detectors for finding the faces and labelling the activities. It also uses tracking algorithms to track detectors in the input video.

IV. PROPOSED SYSTEM

The captured video will be pre-processed to extract the images from video.For this purpose, the video will be converted from 24 fps to 1fps (frames per second) such that each and every individual frame will be extracted from the video.Then the extracted image will be compared for detection of suspicious objects.This system uses Support Vector Machine (SVM) algorithm to detect the suspicious object in the live streaming video which is captured through real-time camera. Keras, a Google database is used to detect the activity by comparing the input video frames with the pre-stored images in database. When suspicious activity is detected, that will affect public peace and when an abnormal behavior of a person such as handling some weapons like gun, knife, stick or bottle is detected, the image will be captured and sent to the authorized person as alert mail using IMAP protocol.

V. MODULES

A. Input Video and Image restoration module

In this module, the real-time camera is used to get the live video streaming input at the place. Further the obtained video will be processed and image frames will be segmented for image restoration based on Fourier transforms.

B. Mode Selection Module

In this module, the system provides the user-friendly interface in which the user can select the mode of detection as knife, gun, stick or bottle according to their detection requirement.

C. SVM algorithm module

In this module, the SVM (Support Vector Machine) classifier is used to perform the live monitoring and the detection of harmful objects in the image. The Object detection technique used in this module will recognize and detect the object of interest such as knife, gun, stick or bottle and draw bounding box around the detected object along with the mention of confidence level in the predicted results.

D. Database Management Module

The system uses the database for the purpose of comparison and to build a strong and effective algorithm that can detect the

presence of object of interest in images by matching it with the pre-stored images in database which consists of positive images (images with object to be detected) and negative images (images without objects to be detected).

E. IMAP protocol module

In this module, the mail alert will be sent to the concerned authority through IMAP (Internet Message Access Protocol) on detection of harmful objects in input image frames.

VI. CONCLUSION

The proposed model has the benefit of stopping the crime before it happens. The real time video 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. The model can be used in any scenario where the training should be given with the suspicious activity suiting for that scenario. When suspicious activity with harmful object is detected, that will affect public peace and when an abnormal behavior of a person such as handling some weapons gun, knife, stick or bottle is detected, the mail alert will be sent to authorized person using IMAP protocol. Thus, it saves the public from danger and also ensures public peace at right time using video analytics.

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