Unusual Crowd Activity Detection Using OpenCV and Deep Learning

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Abstract: Unusual activities are dangerous in public areas as it may cause heavycausalities. As a solution for these various systems are developed based on video frame acquisition where motion or pedestrian detection occur but those systems are not intelligent enough to identify the unusual activities at real time. As it is required to recognize rush situation at real time from video surveillance for spontaneous reaction before any casualties. Proposed system is focused on recognizing suspicious activities and point to achieve a methodology which can detect unusual activity automatically using computer vision. Here the OpenCV library is used for classifying various kinds of action in real time. The motion analysis is detected by the motion influence map which frequently changes the positions. Pixel level presentation is used by the system for making it easy to understand or identify the actual situation.

Keyword: Action recognition, Motion influencer map, OpenCV, Crowd based Activity detection

1. Introduction

Visual/Optical surveillance is highly identified research which has greater area applications is high Visual/Optical surveillance is highly identified research which has greater area applications in human activity monitoring, public safety in spaces like banks, shopping sectors, restricted areas etc, automated identification of events of interest, motion-based recognition, human counting, reality, autonomous robot navigation and other areas[11].The rapid advances in availability of excellent quality and non-expensive video recording devices, super computers, and increased demand for analysis of such footages has made great interest and need of video surveillance in every sector. However, the detection of objects in motion and tracking them from the videos isespecially important as well as critical. Whereas differentiation of objects from there background is also an exceedingly difficult yet important task[12]. That is why it is important to understand the contents of the video and the background of objects. Object from other backgrounds become a vital problem. Hence it becomes the foremost criteria to understand the video and its constituents with depicted scenarios. The predictable intention in unpredicted activitydetection process is usage of a standard human behavior approach. In the beginning, the processis designed with respect to some standard activity dataset. Then, in verification, actual information and facts are compared to the pattern. Eventually, a decision is made whether the activity is expected or not. The prerequisite of defined normal human activity approach makes it difficult for unusual activity detection in real scenario security systems. Detection of humans in diverse backgrounds is done by using yolo pre-trained model as well as convolutional neural networks for more precise accuracy. Structure of CNN is shown in fig 1(a) Pixel level presentation has been used for better understanding or identifying the actual situation. Once the system identifies the unusual activity then a buzzer has been placed to play or to alert the authorized person. The architecture of the
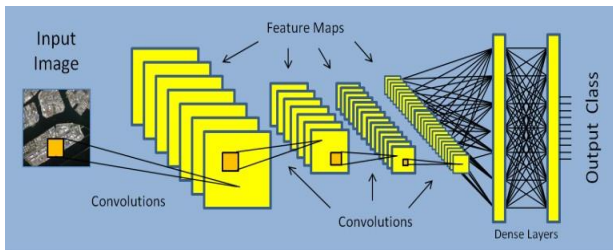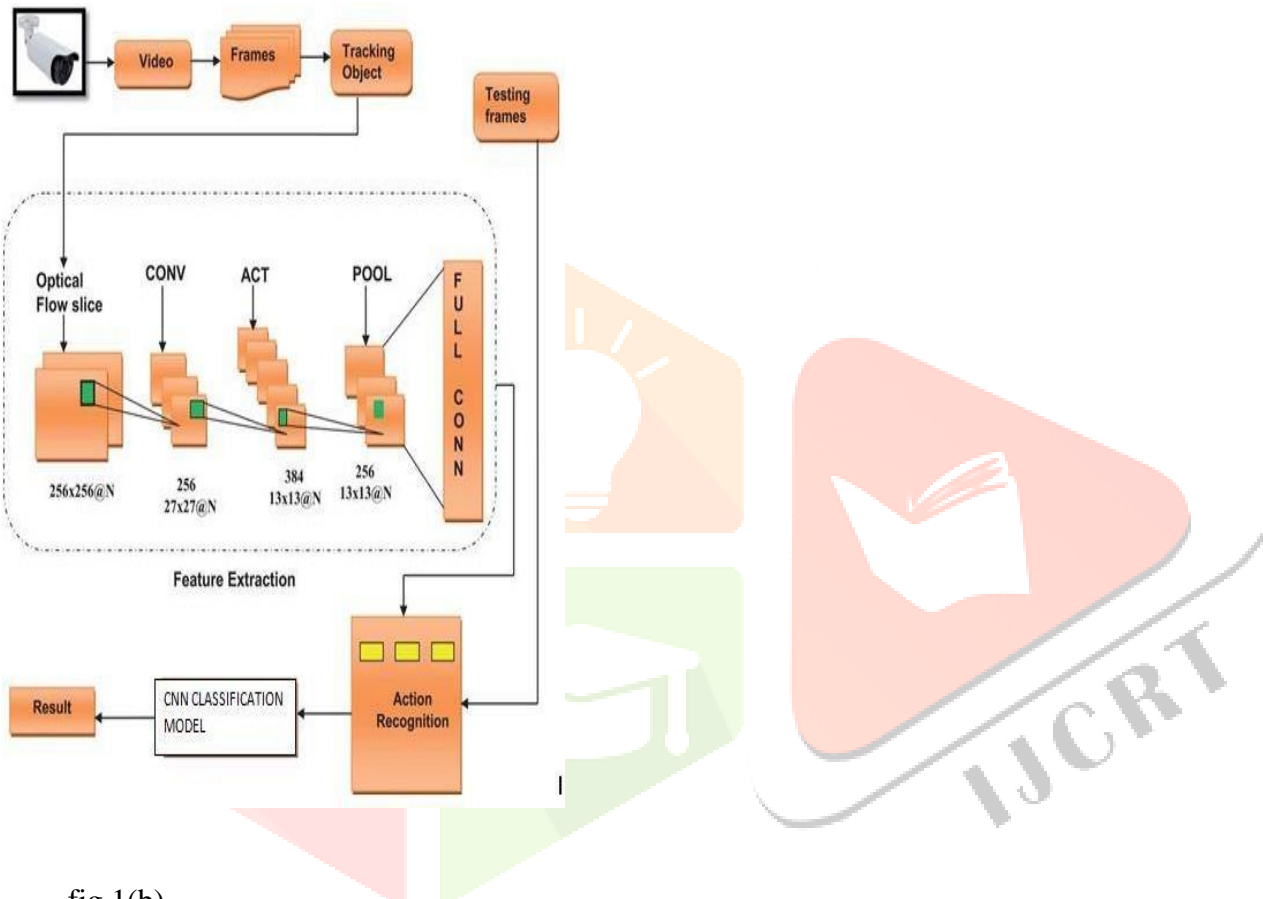
system is shown in fig 1(b).

fig 1(a)

fig 1(b)

2.Literature review

In this paper the author finds optimized object aware anomaly detection technique, based on certain object categories focused on mobile objects. In [1] Rohit C.Gogawale et al. the authors discuss about automated unusual event detection, that plays important role in video surveillance and smart cameras. It can detect uncommon behaviors in the human group activities and detecting the foreground image inputframes, which is converted into grey frame. That frame will detecting the interested object, it shows the accuracy level of the surveillance.

For example, crowd stampede scene.

In this paper the author proposed a novel method for unusual human activity detection in crowded scenes. In [2] Dong-Gyu Lee, et al. talks about the motion influence map, it is representing the human activities and effectively represent the action through crowded scene, the movement speed, direction, and their interaction within the framework. For example, if the motion is normal or usual, there is no frequent changes over the frames in the particular movement of time considered that there is no influence over the map, if frequent changes are there that will be observed as influence on map.

In this paper the author uses radio frequency identification technology to build the model for left, right, front as well as back action of

humans. In [3] He Xu, et al. talks about RFID radio frequency recognition used in recognizing the human actions and used in many fields game, smart phones, computer interaction etc.

RFID is used to build action recognition model for the tag movement i.e., left, right, front, back and it is formatting the data to change process is divided into a number of data segments with the data are temporary together.

In this paper the author presents the pyramid energy maps (PeMaps) as the feature descriptor for a sequence of frames in a depth video. In [4] Jiahao Liet al. here talks about Pemaps present pyramid energy maps; it is a sequence of frames in a depth video in the feature descriptor. It is from the series ofoperation by projecting the depth maps and grouping of energy bit maps with three orthogonal Cartesian planes and consecutive frames, they all have made them to Pemaps. It used in human action recognitions, which represents the motion direction and scope the action.

In this paper the author proposed fusion for human activity recognition based on the action. In [5] Arun Kumar Jhapathe et al. Human activity recognition HAR, study to distinguish between normal activities in daily life like walking, sitting, standing etc. Another one is movement impact map is a movement portrayal procedure through which vitality is separated at the point movement impact map developed from those energies,also recognizing uncommon human action location. Consist of optical flow method in real life situation to determine the speed of moving object. Image pre-processing operators and color based, and texture-based processing is used. In this paper the author describes a review on the multiple human tracking and action recognition along with their drawbacks. In [6], Ms. Varsha Shrirang et al. Lets talks about people tracking and action identification research area is a key role in computer vision. Earlier can detect the actions especially in single user human activity category using skeleton recognition.

This kind of action can only be recognized in plain backgrounds not worth for non -plain backgrounds or outdoor scenes.

Multiuser cation cannot be recognized by this

system, more over it is difficult for the system to recognize group or crowd based activities. In this paper the author proposed a method to detect the action in infants as well as to detect the infants. In [7] Zakia Hammal, et al. Action units' detection are very challenging infants to the adults, to detect the body language or facialexpression in a multi-label. Gather your dataset, split your dataset, train your network finally evaluating them into a constructing deep learning model. In first level we must build a dataset to gather our network, images and labelsare associated with each other to give the finite set, secondly, datasets split into two parts i.e A training set, other A testing set.

Training can be used for classifier to learn, and testing is a set as part of your training data.

Thirdly, given our training to the set of images, we can train our network, the main purpose of this is how the network would recognize each the categories in our labelled data.

Finally, we have evaluated our trained network and ask it to predict what it thinks the label of the image is, we then tabulate the predictions of the model for an image in the testing set.

In this paper the author provides a comprehensive survey of the recent development of the techniques and quantitative evaluation of the performance of the human activity recognition. In [8] Somaiya Sen, et al. Here talks about nowadays digital content of visualization are incredibly challenging to everyone, like content-based image or global based image feature are the visual content to the world. The system consists of an ensemble of CNNs along with the image preparation operations and neural network NNs, that combine the image features from the CNNs with the image, the ensemble merges the outputs of the NNs by means of unweighted averaging into a set of prediction probabilities for the classes. The maximum probability determines the classification.

3.Application
➢ Any hazardous industrial areas.
➢ Military areas.
➢ Schools and colleges.
➢ Public crowd areas.

4.Conclusion

This technology is used to build the action recognition, uncommon activity finding in the crowded area, for deciding that activity is expected or by using this method we can easily observed. Motion influence map that comprises for correct recognition rate and framework to besuspicious.

Recognizing unusual activity from crowd is difficult task especially for sensor network computer vision is an effective approach that can acquire real time human activities and lateranalyzes for uncommon frame. So, we will develop this deep learning system to classify the activity.

5.Future work

This system has been growing of surveillance cameras in private and public areas, having huge number of demands on the future intelligent analysis and also getting recognition for sequences of video. Can detect both localized and relating to the whole world unusual activities within the bind framework. And performance of dataset will be on the exact target. Also representing power of the proposedmotion influence map for both space and time to be distinctive.

In this regard, having future limitations are dealing with these functionalities in an area of expect research, will be conducted by further, toreaching out this method.

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