Research Article   ISSN: 2394 - 658X

A Survey on Violence Detection Techniques

[1]Prof. Veena K. Katankar, [2]Piyush A. Fukat, [3] Puja S. Delikar, [4]Arti M. Waghmare

[1] Assistant Professor, Department of Computer Engineering, Suryodaya College of Engineering and Technology, Nagpur, India
[2] Student, Department of Computer Engineering, Suryodaya College of Engineering and Technology, Nagpur, India
veenakatankar@gmail.com, piyushfukat7@gmail.com, pujadelikar@gmail.com, artiwaghmare@gmail.com

_____

ABSTRACT

The mission of the Human Fight Detection is to control the growing violence in day to day life of human by implementing the appropriate violence detecting algorithms. Surveillance scenarios like prisons, psychiatric centers or even embedded in camera phones, but cannot be more capable to solve the problem or cannot be more effective to take action on needed time such types of violence are now on growing tremendously. As a consequence, there is rising interest in developing violence detection algorithms. Recent the work considered by the well-known Bag of Words framework for the specific problem of violence detection. Under the framework of this, spatial-temporal features are extracted from the videos sequences and used for classification.

The dataset of violence collected, which consists of fight scenes from surveillance camera videos available in sources of online platforms. The dataset is made publicly available. From the extensive experiments conducted on Hockey Fight, Pellicle , and the newly collected fights datasets, the overall research have been totally helpful for us for finding the new potential for the future references.

Key words: Deep Learning using CNN (Convolutional neural Network), Surveillance camera, data set videos, Snippet prediction, support vector machine

_____

INTRODUCTION

The thought of developing this project comes to do some good for the fight prevention of human beings. Few years ago the cameras and other ,surveillance equipment were used on different places like streets, banks, hospitals, educational institutes,offices,etc., for monitoring the suspicious activites of humans. Observing and monitoring the behaviors of suspicious activites are normal or not this made it difficult tasks to do and also access the more storages of recorded videos. Overall finding the suspicious activites managing all data is very difficult task. And also the necessary action were taken which are not implemented on time.

This all different methods were used by todays. To deals with this, different methods have been developed to recognize the violences of real life. These methods were helps to detect the suspicious activities in the surveillance equipment. In these methods different approaches are proposed that which runs with different input parameters. Flow, time, appearance, acceleration, etc., are the different attributes of parameters. In the suspicious activities detection process, the first process is to divide a whole video into frames and segments. And the second process is to detect the object from the video frames which is captured. Third process is extracting the attributes of the video according to the implemented methods. And

lastly, it successfully detects the suspicious activities from the frames. Different methods of the detection process from the surveillance videos by using computer vision are discussed and explored successfully using systematic review.

RESEARCH METHODOLOGY

Violence is suspicious events or day to day life activities were happened in normal life. Detection of such events in surveillance videos through computer vision becomes the active topic in the field of action detection. There are many researchers who proposed different techniques and method for detection of abnormal events which is rapidly increasing of crime rate for more accurate detection. Different techniques of violence detection are used in the recent years. There are techniques of violence detection which are mainly classified into three categories: VDT using machine learning, VDT using SVM and VDT using deep learning.

VIOLENCE DETECTION USING MACHINE LEARNING TECHNIQUES

With a computer vision, the recognition of activities become an active topic. Here are the different traditional algorithms of machine learning such as Adaboost, KNN, etc. Motion Blob (AMV) acceleration measures vectors methods for detections of fast violence or fast moving object from video. The motion blobs have a specific shape and position, the difference between consecutive frames is computed for absolute images. After that the resulting image is binarized which is leading towards the number of motion blobs and recognized the largest one on a fight sequence and on a non-fighting scene. With this different parameters are calculated such as area, centroid, perimeter and the distance between the blobs as well. After that the blobs are characterized as fight and non-fight. The dataset of videos has thousands of clips available on youtube. The results of the proposed method is outperformed by state of the artmethods considered that are LMP, Vif, BoW (MoSIFT), BoW (SIFT), variant v-1 and variants v-2 which is used KNN, SVM and Ada boost as a classifier in terms of ROC and accuracy.

VIOLENCE DETECTION TECHNIQUES USING SVM

By using the Support Vector Machine (SVM) as a classifier techniques of violence detection are discussed. In SVM within two classes we plot the data on dimension space and differentiate it. SVM is an algorithm which is used to classify the problems using supervised learnings. SVM is widely used method in computer vision and it is also for the tasks related for binary classification. SVM is based on the kernel, that converts the input to the high dimensional spaces where the problem can be solved. There are many methods in SVM can be used. Various methods are: real-time detection of violence in crowded scenes, Bag of words framework using acceleration, action detection, Bi-Channel Convolutional neural network for real, time detection, GMOF framework with tracking and detection module, Multi model features framework on the base of the subclass, Solve detecting problem by dividing the Objective, in depth and clear format using Con Net, To determine the occurrence of violent purpose extended form of IFV (Improved Fisher vector) and sliding windows, method for detection anomalies in the video, Violence detection using Oriented Violent Flow.

VIOLENCE DETECTION TECHNIQUES USING DEEP LEARNING

The violence detection techniques uses the algorithms of deep learning in the proposed frameworks. Various method which is used to used recognized the methods are co9nvolutional neural network (CNN, Cov-Net) base classification. Deep learning base on neural networks. To classify the violence recognition based on the extracted features and data set by using more convolutional layers. There are many methods of violence detection which uses the of algorithms of deep learning, such types of methods are: Deep architectures for place recognition, violence scene detection using CNN and deep audio features, detect violence videos using convolutional long short-term memory, detecting human violence behavior by integrating trajectory and deep CNN, violence detection using 3D CNN, fight recognition method. The major aspects of the detors is efficiency that approaches should be fast computational

ANALYSIS SURVEY

After survey found human activity recognition with kinetics algorithm is the best technique to recognise the human violence detection in this technique we recognise nearly total 400 activities of human to check what activity is going on particular video frame for this in this project a model is prepared which recognise this all 400 human activities with this training model the training model is take any type of video about human activity recognition then and with approx 94 to 95% accuracy video frame is isrecognised by the algorithm that the frame has which activity from 400 activities classes of training model.

Preparation of training model is a very big and exhausted process which take nearly a month to be prepared in this process to prepare model almost 3 lacs videos from YouTube with different it activities of human are used to prepare this important model.

Machine learning is a technique or technology which is used to prepare this model from the videos In this project these videos are used to prepare this model bye contextual neural network CNN. Contextual neural network is an algorithm or technique which is create aa neural network like human brain which characterize the videos from non-violence and violence human videos to prepare this model.

In this all-videos half videos for nonviolence and half videos for volumes of human activities with distribute this video in two folders like violence and nonviolence and first we train the model which nonviolence videos using CNN technology and algorithm then model is like prepared for non-violence video recognition after this model which train with valence videos and after this model is family prepared for or both violence and non-violence video.

With this process our model is prepared finally for test video. Now take a video for test a module which is used to take this video and extract frames from video and each frame is test by the this model with kinetics algorithm and this model recognize the frame is non-violence or violence and module count the frame as violence on non-violence as per the model recognization if violence frames are found Abu 25 frames in in video then siren will sound for 5 seconds and after that agraph will show the percentage of violence and nonviolence in video with bar plot. If frames found as non-violence then no siren will sound but graph will print the percentage of violence and nonviolence frames counts Above mention technique is used in this project
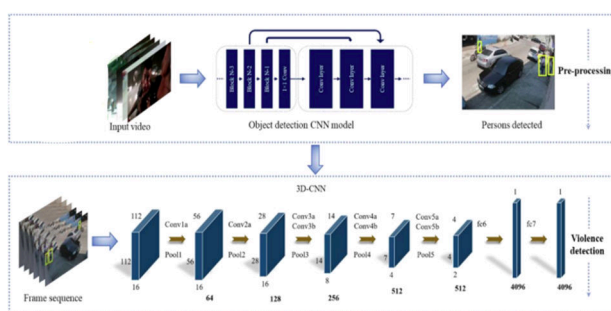

Fig. 1

Fig. 2

CONCLUSION

With the increase of surveillance cameras in different fields of life to monitor the human activity, also grow the demand of such system which recognize the violent events automatically. In computer vision, violent action detection becomes hot topic to attract new researchers. Indeed, many researchers proposed different techniques for detection of such activities from the video. The goal of this systematic review is to explore the state-of-the-art research in the violence detection system. The systematic review delivers details of methods using SVM, CNN and traditional machine learning classification-based violence detection. These techniques are deliberated. Moreover, datasets and video features that used in all techniques, Accuracy is depending upon the techniques of features extraction, object recognition and classification along with dataset being used. Our study potentially contributes in highlighting the techniques and methods of violence activity detection from surveillance videos.

REFERENCES

[1]. W. Sultani, C. Chen, and M. Shah, ''Real-world anomaly detection in surveillance videos,'' in Proc. IEEE Conf. Comput. Vis. Pattern Recognit., 2018, pp. 6479–6488.

[2]. I. S. Gracia, O. D. Suarez, G. B. Garcia, and T.-K. Kim, ''Fast fight detection,'' PLoS ONE, vol. 10, no. 4, Apr. 2015, Art. no. e0120448.

[3]. O. Deniz, I. Serrano, G. Bueno, and T.-K. Kim, ''Fast violence detection in video,'' in Proc. Int. Conf. Comput. Vis. Theory Appl. (VISAPP), vol. 2, Jan. 2014, pp. 478–485.

[4].   L. Tian, H. Wang, Y. Zhou, and C. Peng, ''Video big data in smart city: Background construction and optimization for surveillance video processing,'' Future Gener. Comput. Syst., vol. 86, pp. 1371–1382, Sep. 2018

[5].   C. Dhiman and D. K. Vishwakarma, ''A review of state-of-the-art techniques for abnormal human activity recognition,'' Eng. Appl. Artif.Intell., vol. 77, pp. 21–45, Jan. 2018.

[6].   P. Zhou, Q. Ding, H. Luo, and X. Hou, ''Violent interaction detection in video based on deep learning,'' J. Phys., Conf. Ser., vol. 844, no. 1, 2017, Art. no. 12044.

[7].   S. Chaudhary, M. A. Khan, and C. Bhatnagar, ''Multiple anomalous activity detection in videos,'' ProcediaComput. Sci., vol. 125, pp. 336–345, Jan. 2018.

[8].   A. B. Mabrouk and E. Zagrouba, ''Abnormal behavior recognition for intelligent video surveillance systems: A review,'' Expert Syst. Appl., vol. 91, pp. 480–491, Jan. 2018.

[9].   Z. Mushtaq, G. Rasool, and B. Shehzad, ''Multilingual source code analysis: A systematic literature review,'' IEEE Access, vol. 5, pp. 11307–11336, 2017.

[10].   T. Zhang, Z. Yang, W. Jia, B. Yang, J. Yang, and X. He, ''A new method for violence detection in surveillance scenes,'' Multimedia Tools Appl., vol. 75, no. 12, pp. 7327–7349, 2016

[11].   Tianyi Hong, Huabiao Qin, Qianshu Sun, "An improved real time eye state identification system in driver.