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Abnormality Detection In Crowd

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ABSTRACT

Fast increase in population of cities, cause people getting panic because of terrorist movement. Now it has become more dangerous and serious intimidation. Therefore, the crowd analysis in surveillance videos is a new research area, however, public area is having large number of crowded scenes and it contains moving crowd and also involves object movement. The object size is very small because of that the objects appear entirely smaller and in crowd people walk randomly and close up one another. All the factors make the survey difficult. A feature is used to analyze movement of the people. These properties use of space and terrestrial movement information of points of interest. Then a method used group the feature points primarily and then collectiveness is calculated. Collectiveness makes group computation more efficient effectual. People status is obtained by crowd descriptors.
Keywords- crowd analysis, feature extraction, abnormality detection.

I.INTRODUCTION

Public safety is important due to the increasing population and crowd is also increasing in public areas like, stadium, stations, malls, etc. For the purpose of security correct action needs to be takes in emergency situation and in situation of unusual events. Occurrences of the recorded videos are useful for the people in security team. Motion detection and tracking are the most common problems in surveillance systems that can be dealt with the integrated computer vision algorithms. Crowd analysis includes the details of data gained and understanding the natural movement of an individual or a group of objects. Human beings are the important matter in the analysis of crowd tracking behavior and this involves how a crowd move and when the pattern of crowd movement changes. The moving people in public place traced using Kanade-Lucas-Tomasi feature tracker. The spatial and temporal features are trace at definite points calculating their intention, at particular location and calculate magnitude of velocity. The radial basis function used to smoothen the tracked trajectories. To prevent criminal activities, a video surveillance system is more popular in many place. In public place people move towards their jobs and that's form some crowd(s). A crowd is nothing but more number of people in a small region, interacting with each other. People movement is out of prediction; it means some abnormal events are occurred.

1.1 Objective

- Computation of crowd descriptors.
- Representation of spatial and temporal content of in public areas.
- To obtain crowd collectiveness more exactly and rapidly.
- To access people status in the crowd.

1.2 Motivation

Crowd analysis is a major field of interest. Due to the growth in population in technical as well as social fields of interest. Management of crowd strategies is used for crowd analysis in public events camera surveillance in virtual environments makes the field more acceptable and helps to prevent disasters because of heavy crowd.

1.3 Problem Statement

The crowd motion data is extracted by detection method. However, people in the crowd cannot be record completely along the long term motion features.

1.4 Solution To Problem

Crowd collectiveness descriptors are used to track crowd movement in public areas. For getting more correct and quick crowd collectiveness.

1.5 Proposed Methodology

To achieve the crowd collectiveness more correctly and fastly, collectiveness descriptors used to explain the people action in public place. It consists of 5 steps as shown in Fig. 1

[1] Crowd movement can track by gKLT.
[2] Smoothing trajectory by RBF.
[3] Extracting the feature information.
[4] Clustering.
[5] Computing the collective descriptor.

II.LITERATURE SURVEY

In the paper "Online Anomaly Detection in Crowd Scenes via Structure Analysis" authored by Yuan Yuan, ,Jianwu Fang, and Qi Wang, they use structure context descriptor (scd) is used for define the individual people and to identify the abnormality in every frame using robust multi-object tracker, 3-D discrete cosine transform (DCT) is used. Detecting each individual in the video they use Pedestrian Detection algorithm and use the pedestrian detection algorithm. The targets are marked by a rectangular box of different sizes. The descriptor introduces the PEF-PIF(peak expiratory flow-peak inspiratory flow). In this anomaly is detected by online. The SCD variation is calculated by the Earth mover' distance (EMD) [1].

In the paper "Human Violence Recognition and Detection in Surveillance Videos" authored by Piotr Bilinski and Francois Bremond, they have proposed an important topic used to detect violence in videos. This used to recognize if violence has occurred in a video and when it happened for detection of violence. They have proposed a method for Improved Fisher Vectors (IFV) in videos. Speed up the approach the sliding window is used for violence detection, and they re-formulated the Improved Fisher Vectors. The Improved Fisher Vectors are a bag-of-features. It describes Gaussian Mixture Model [2].

In the paper "Measuring Crowd Collectiveness" authored by Hepeng Zhang, and Xiaogang Wang, a described collectiveness of large number of people that are natural in Collectiveness, indicates the individuals acting as union or group, which is a basic and general measurement used in different crowd systems. They have presented a Collective Merging algorithm which is used to identify the collective motions from random. It depends on many factors, such as making decision and process of people, density of the crowd, and structure of the scene. Different crowd systems is having bacterial colonies, insect swarms to fish shoals and then collective motions widely exist [3].

In the paper "Interactive Crowd Content Generation and Analysis using Trajectory-level Behavior Learning" authored by Sujeong Kim, Aniket Bera and Dinesh Manocha, an bilateral approach is presented for understanding crowd videos and to create the content for transmission applications. From computer vision it combines online tracking algorithms, from computer graphics non-linear pedestrian models, and to calculate the trajectory-level pedestrian behaviors use the machine learning techniques in the video. Identify the anomalies behavior Pedestrian behavior is used to perform crowd replication. With artificial intelligence they also extend crowd videos. Position, velocity, and intermediate goal position at a given time by the estimation. Based on that states, trajectory behavior features calculate current location and describe the past and future trajectory characteristics [4].

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III. SYSTEM DESIGN

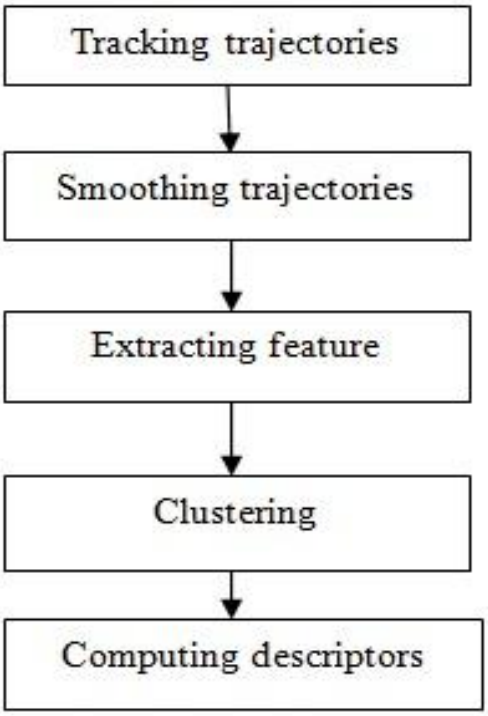

Fig: system design

Depending on the feature, the crowd descriptors are computed by a method. First, according to the similarity of feature points the number of peoples in a groups is to be set rapidly according to the similarly of feature points. Second, depending up on the normalized cuts the collective descriptors are calculated. Crowd descriptors encode the clash among groups, crowd status in the public areas the difference of motion magnitude and the degree of discretion in one group, are proposed.

The crowd video is having large moving data with terrestrial and spacious stability that are used to know the crowd behaviors. Tracking methods is used to decide crowd trajectories, based on certain feature points, such as the KLT and the optical flow.

IV. RESULT AND DISCUSSION

In this section, we are doing result simulation using Matlab-2016b and system configuration Intel i5 Processor, 8GB RAM, 2GB NVIDIA Graphics with windows 10 operating system. Here, we considered very popular data set for the video surveillance research purpose such as UMN dataset, which originally there in avi format. Additionally, it consist different type of data sets such as corridor that also in the form of video. Each dataset having thirty frames at per second in that we are taking only 2 frames per second, which can increase the chances for usability in real-time scenario. In each dataset, there are normal frames and abnormal frames, where normal frames shows the normal activity of crowd and whereas abnormal frames shows the abnormal activity of crowds, to compute the effectiveness of our proposed model here we consider Ground Truth as to be reference.

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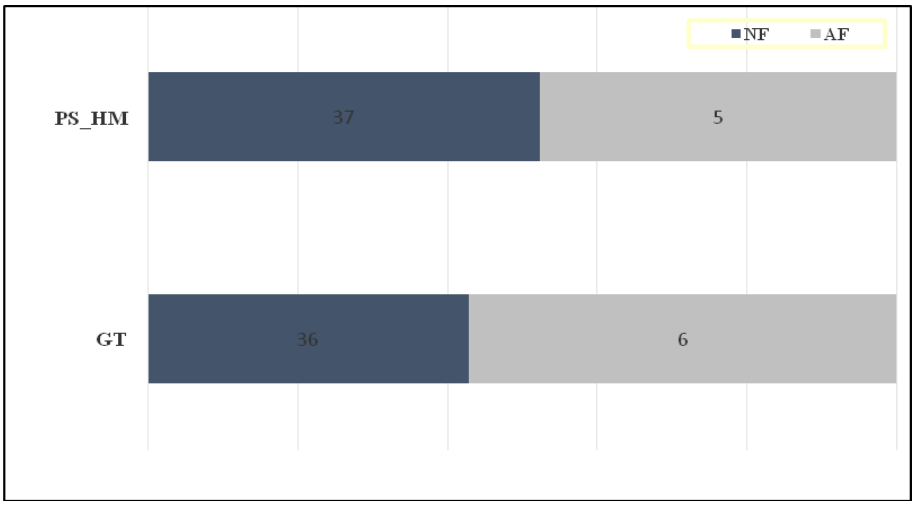

Figure 1: Comparison w.r.t GT at corridor Dataset

Figure 2 represents the comparison with respect to Ground Truth (GT) at corridor dataset, where the GT represents the abnormal frame (AF) are started from 37th frame and our model i.e. D&T detected at 38th frame and so on.

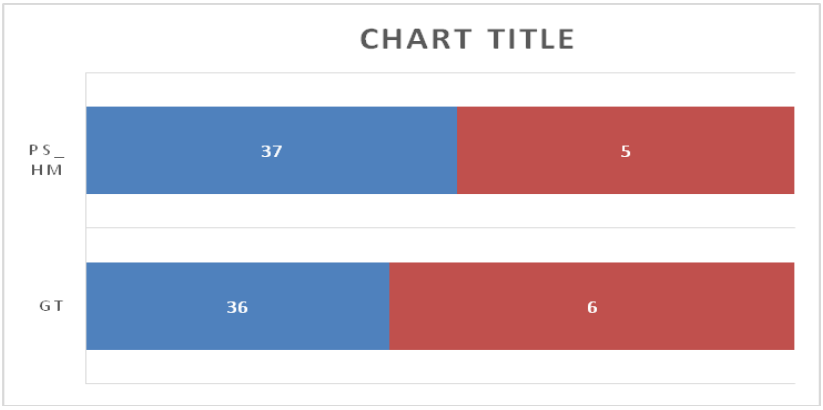

Figure 2: Comparison of PS and GT

Accuracy: Accuracy the degree to which the result of a measurement, calculation, or specification conforms to the correct value or a standard. Here the accuracy shows the better results when compared to ES.

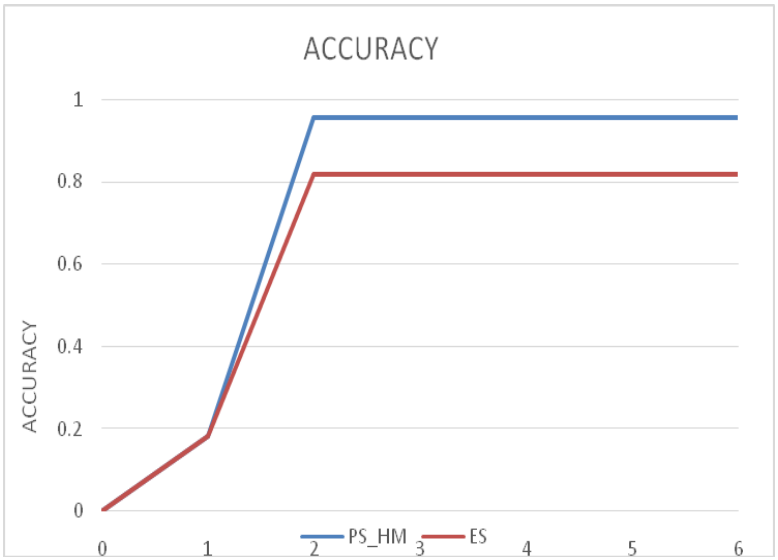

Figure 2 Comparison of existing and proposed based on accuracy

Efficiency: Efficiency the ratio of the useful work performed by a machine or in a process to the total energy expended or heat taken in. Here, Efficiency shows the better results when compared to ES.

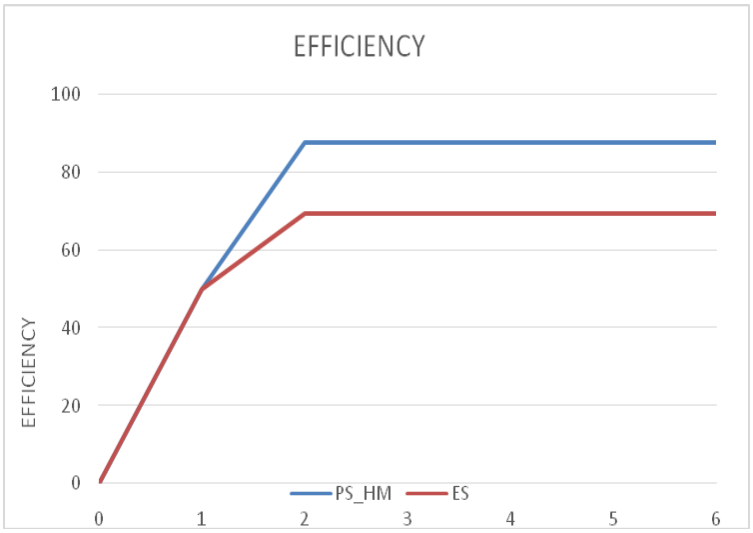

Figure 3 comparison of existing and proposed based on efficiency

Classification Error: Classification error is a type of measurement error by which the respondent does not provide a true response to a survey item. For nominal categorical data this can occur in one of two ways: a false negative response or a false positive response. Here the classification error shows the better results when compared to ES.

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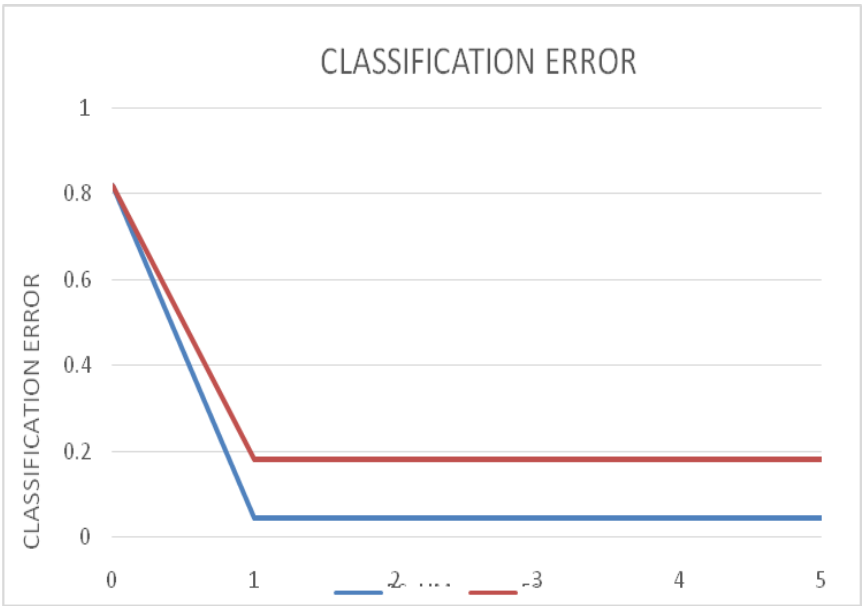
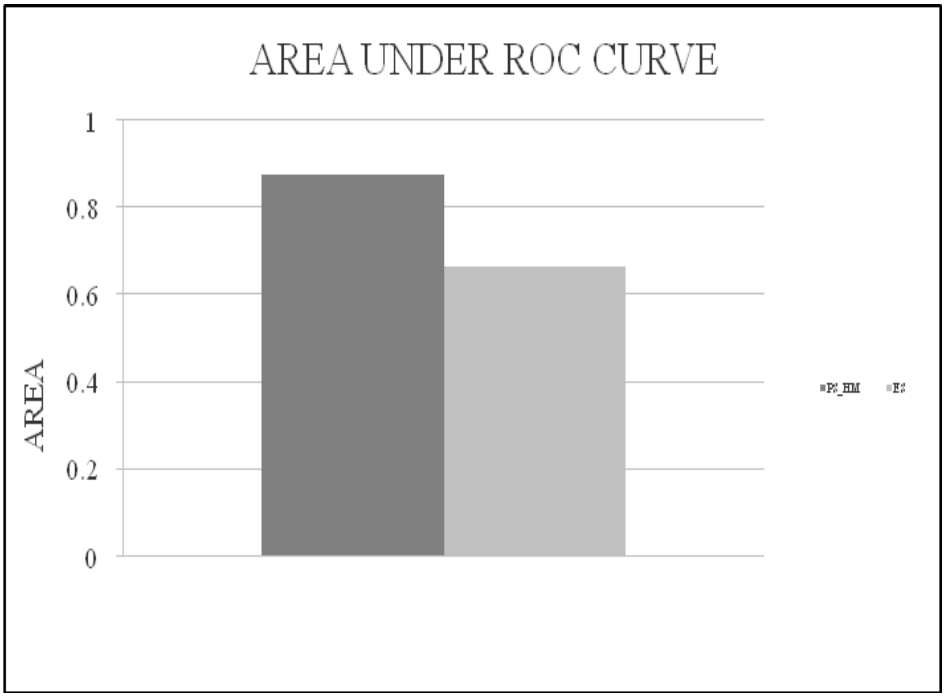
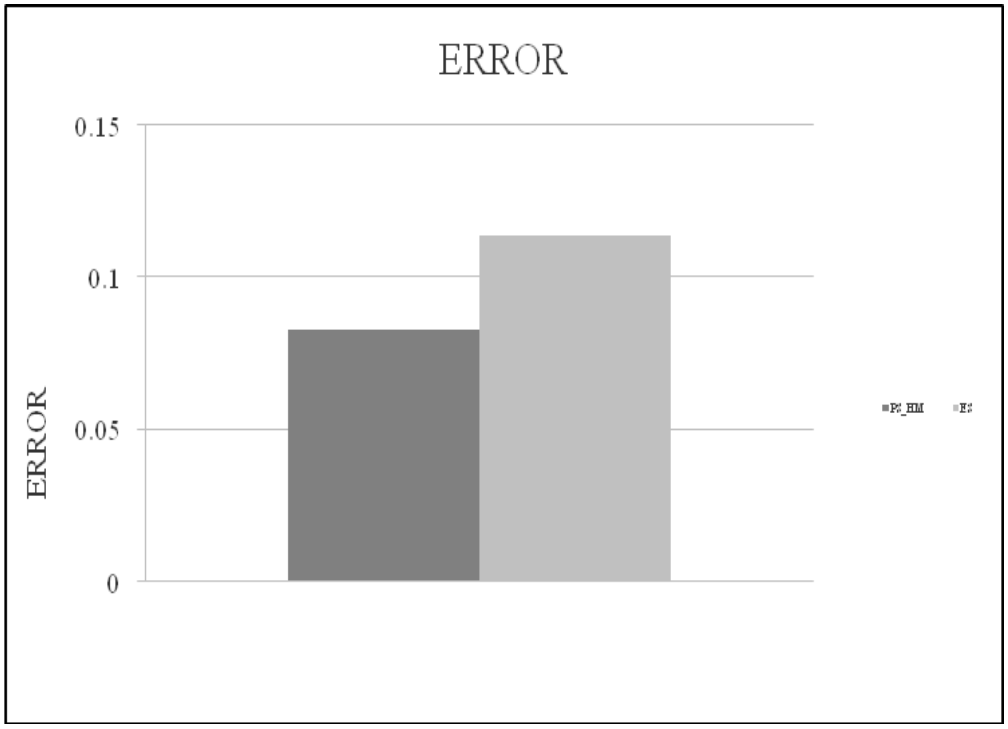


Area under Curve:

Area under ROC: AUC stands for "Area under the ROC Curve." That is, AUC measures the entire two-dimensional area underneath the entire ROC curve (think integral calculus) from (0,0) to (1,1). Here the ROC curve shows the better results when compared to ES.



Error Rate: Error rates refer to the frequency of errors occurred, defined as “the ratio of total number of data units in error to the total number of data units transmitted.” As the error rate increases, the data transmission reliability decreases. Here the error rate shows the better results when compared to ES.



V. ADVANTAGES

- Well relates the point of interest in spatial and temporal motion.
- Detecting collective motions from crowd clutters.
- Use full for real time crowd scene analysis.

VI. APPLICATIONS

- To formulate the crowd collectiveness in public places.
- Indicates a reliable method for the public safety.
- Applied in any area of day-to-day life.
- It deters potential offenders and dishonest employees.

VII. CONCLUSION

The crowd scenario is very tough to understand for the machines, also because of more diversity and complexity of the integrals within the frame makes more complex. To learn the different crowd's behavior, when the dynamics and context of the crowd is varied with respect to time it very still tougher. Implemented Proposed-algorithm, which is observational filter based, the PS, at the beginning collects the locations of the people from the image. By which conviction values are detected at specific locations, PS evaluates the weight values for multiple observation and separate features, due to that they can estimate the behavior weather it is normal or abnormal within the specific frame. The implemented technique is used on various UMN dataset, later for analysis of the result apply classification model of BoF to obtain AUC based on GT,

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