COLLECTION OF EVENT DISCOVERY FOR VIDEO SURVEILLANCE – A SURVEY

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Abstract

Video analysis and video surveillance are active areas of research. Automatic activity recognition plays an important role in video surveillance. In this paper, we survey the state-of-the-art in the development of automated visual surveillance systems. This paper presents a framework for event detection and surveillance. Video surveillance systems are used to reduce crime and also create an atmosphere where the people are in safety and security. This paper surveys the methods and process, devices, algorithms and intelligent technologies for video surveillance systems in various articles.

***Keywords* — Pose estimation, Group event detection, Clustering, Surveillance, Motion tracking systems.**

I. INTRODUCTION

Video Surveillance is the process of observing the motion, performance, activities, or other changing sequence, generally of people for the function of manipulating, super visioning, directing, or protecting. Surveillance is very useful for identifying the human motion or human actions, and also used for police force to identify and catch the thief and keep common control, identify and observe the threats, and prevent or scrutinize the wrong action.

The Video surveillance system runs on 24*7 (24 hours in a day). This process becomes a large amount of data including video frames, extracted videos, observant, information, etc. Detecting human group behavior or human interactions has attracted increasing research interests. Various illustrations of crowd events are people fighting, people jacking, people playing, people walking, people being followed, group conversations in a party, terrorist launching bombs or attacks, etc.

The events are captured using video camera and recorded in the system, and then these videos are converted as frames and pixels for object tracking, finally suspicious events are reported. The aim of an intelligent surveillance system is to repeatedly process the video rivulet, continuously record all the events in the place in all situations for several days, then to separate the actions taking place and to infer whether they present a threat that should be signaled to a human operator.

II. RELATED WORK

In [1], symmetric–asymmetric activity structure, Group representative (GR), seed-representative centered clustering algorithm is proposed. The symmetric–asymmetric activity structure is used to solve the addressing problem of detection with a hierarchical activity structure. That is the events are classified into symmetric and asymmetric events. Furthermore the symmetric events are classified into two or more sub groups for varying number of group members. To represent an each symmetric sub group, the group representative concept is used. The group representative is classified into three categories. They are Physical GR, Virtual GR and Selective virtual GR. Seed-representative centered clustering algorithm is used to solve the addressing problem of asymmetric distance metric. It solves the problem by extracts only the high correlation pairs at the same time single active person in the seed detection.

In [2], the author uses category feature vector (CFV)-based model to adding new events to the system, we only need to define the new events and not change the existing events. They also proposed Lack Training Samples (LTS) for recognizing the events. It deals with the problem of building models for activities lacking training data by describing a rare object to different parts from familiar objects. Furthermore they uses Confident frame based recognizing algorithm. This algorithm is used to address the improving accuracy. These confident frames generate the local or specialized model at the time of accuracy. These models are used to separate the frames. To select the most possible events is done by global model. To decide the best one event is done by local model. This algorithm is used to separate the number of positive samples and negative samples. So this algorithm enabled more features to facilitate the recognition.

In [3], the two layer hidden markov model is used to decomposing the hierarchical problem on low

dimensional observation space and the frame work was easy to interpret where the individual and group actions are meaning cleared. The two layers are trained autonomously. These are based on set of eight group actions. The first layer is used to recover the individual actions and the second layer is used to recover a group actions. They survive the video in a meeting room equipped with synchronized multichannel audio and video recorders. They use Gaussian mixture models (GMMs) to represent the production distribution. In single layer hidden markov model, the person specific AV features, person specific audio features and person specific visual features are measured individually. Furthermore, group visual features and group audio features are measured. These are used for individual action recognition. In two layer hidden markov model the early integration of soft decision is made for audio and visual and AV, multistream of AV for soft and hard decision and Asynchronous Hidden markov model of AV for hard and soft decision are measured for group action recognition.

In [4], the authors proposed graphical model for learning and recognizing human actions for surveillance video. They use Gaussian mixture model to model the relationship between people. The salient postures and action graph are measured by expectation and maximization (EM) algorithm. It becomes effective and robust. This algorithm is also used for expanding new actions. The author uses an action graph for encode the dynamics of actions in an effective manner modeled by Gaussian mixture model. There are five decoding schemes are derived. The graphical model can be easily expanded for a new action is an important role. The two stage method is developed for the salient postures and action graph for allocating salient postures and motion features. The proposed graphical model and algorithms are used for large amount of dataset. The five decoding schemes for quantitative and qualitative comparisons are provided.

III. COMPARATIVE STUDY

The methods and process, devices, algorithms and intelligent technologies are analyzed and a comparative study is done. Table I shows the result.

TABLE I
COMPARATIVE STUDY OF VARIOUS TECHNIQUES

	[1]	[2]	[3]	[4]
Sub group	YES	NO	NO	NO
Adding New actions	NO	YES	NO	YES
GR	YES	NO	NO	NO
Accuracy	YES	YES	YES	YES
Gaussian mixture	NO	NO	YES	YES
Robust	YES	YES	YES	YES

IV. CONCLUSION

In this paper, the various methods, process, devices, algorithms and intelligent technologies are studied, analyzed and compared. Most of the previous works deal only with static data while recent works support dynamic operations. Some schemes allow the new actions while others not. Some schemes separate or classified the sub groups. Video surveillance is a hot topic in research.

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