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SECURITY TOWARDS VIDEO SURVEILLANCE

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Abstract*:* Surveillance is, quite simply, observations conducted to gain information. This simple definition includes a plethora of techniques and methods that can be considered a form of surveillance. The most well-known methods include technical surveillance typically covert video or audio recordings. Video Surveillance is an approach to Security to physical and capital asserts. It is necessity to observe people, places and things coupled with a desire to pull out more useful information from video data is motivating new demands for scalability, capabilities, and capacity. The aim of the surveillance applications is to detect, track and classify targets. This paper addresses some of the approaches for video surveillance security systems.

Keywords: Video Surveillance Systems, Object Tracking, Multiple objects Environment, Real Time Video surveillance.

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INTRODUCTION

A video security surveillance technology has been developed from the existing passive technology which simply recoding facilities and passers to intelligent technology to recognize situations in real time and respond by itself. Currently, the intelligent video security surveillance systems are largely divided into system through image analysis and system based on location recognition applied to ubiquitous sensor network technology. Human body modeling identifies the body positions and activities in video sequences. The model proposed by them is shown in Figure 1. The frame work of the system starts with the acquiring of video images by means of camera and pre-processing has to be done on them for enhancing the quality of frames in the sequences. The video frames have a lot of noise due to camera, illumination and reflections etc. This can be removed and quality of images can be enhanced with the help of preprocessing stages. The suitable steps should be carried out in this stage.

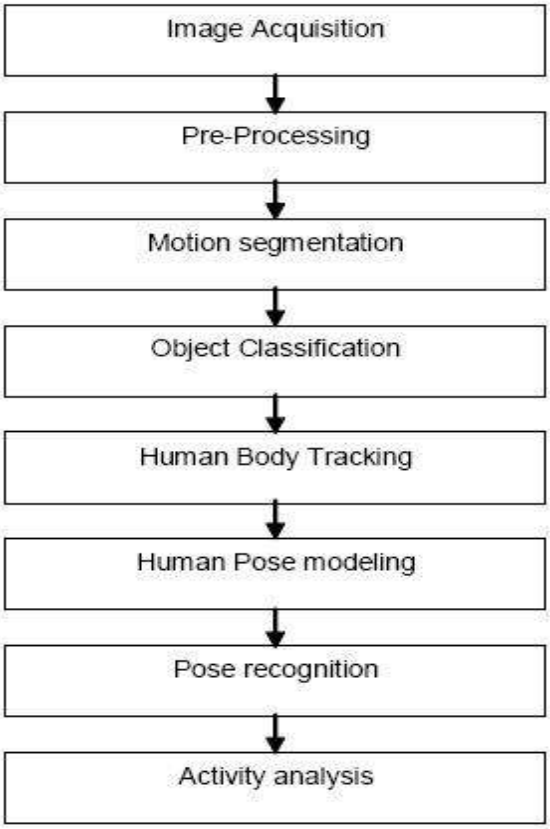

Fig. 1. Various Stages

The next stage is motion segmentation which separates foreground images from background images and it is followed by Object classification, Tracking and Human pose modeling. At the end, the activity analysis will be processed.

2. LITERATURE REVIEW:

Human motion analysis helps in solving problems in indoor surveillance applications.

K. Srinivasan et al [2009] presented an attempt to give an idea of human body tracking in surveillance area of monocular video sequences. They have discussed various kinds of background modeling techniques like Background Subtraction Method, Adaptive background subtraction method, Adaptive Gause Mixture Method, 2D and 3D human body tracking methods etc. Human body modeling identifies the body positions and activities in video sequences. **[2]**

Massimo Piccardi [2004] reviewed about eight background subtraction techniques used for object tracking in video surveillance ranging from simple approaches, used for maximizing speed and restraining the memory requirements, to more complicated approaches, used for accomplishing the highest possible accuracy under any potential circumstances. **[3]**

Muller-Schneider's et al [2005] presented a full-fledged introduction to the real time video surveillance system which has robustness as the major design goal. **[4]**

3. VIDEO SYSTEM FOR URBAN SURVEILLANCE

The system comprises the function of object detection, tracking, recognition and classification. The problem of object detection has been tackled using statistical models of the background image [7, 8, 9] frame differences techniques or a combination of both [10].

3.1. System Description:

The surveillance system implemented can be viewed as four independent, but interacting modules: detection, tracking, classification and recognition (see Fig. 3). To perform the detection task, a robust real-time algorithm, suggested by T. Boult [7] was adapted. The approach followed uses two adaptive background images, per-pixel adaptive thresholds and a region grouping algorithm, named quasi-connected components (QCC).

The tracking algorithm determines the overlap between detected regions in consecutive frames, in order to link them, when no ambiguity exists. The linking of an

active region in consecutive frames originates a stroke, which describes the evolution of the mass centre over time. The classification task is performed each frame for all active regions detected, and the classification of a stroke is performed by determining the most voted class. To cope with tracking ambiguities, a colour-based recognition module is also integrated in the system [11].

3.2. Detection:

Object detection is the first stage in most tracking systems and serves as a means of focusing attention. There are two approaches to object detection: background subtraction and salient motion detection. Background subtraction assumes a stationary background and treats all changes in the scene as objects of interest, while salient motion detection assumed that a scene will have many different types of motion of which some types are of interest from a surveillance perspective.

3.3. Tracking:

The purpose of tracking is to determine the spatial temporal information of each target present in the scene. Since the visual motion of targets is always small in comparison to their spatial extends, no position prediction is necessary to construct the strokes [9]. The association of regions and their classification is based on a binary association matrix computed by testing the overlap of regions in consecutive frames. Whenever there is a match, the stroke is updated. Tracking also interacts with the detection. When a target stops in the scene for a certain amount of time, the tracker merges the target in the background.

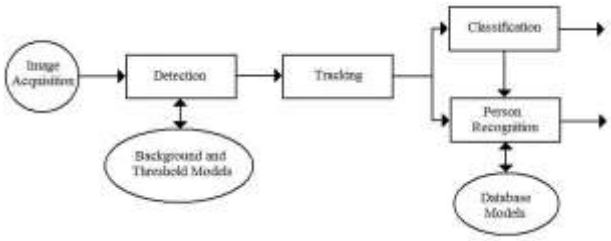

Fig. 2 System block diagram

3.4. Classification:

The classification task interacts with the tracker in each frame, voting for the class of each detected target. In this way, a final class is chosen for each stroke as being the most voted one.

3.5. Recognition:

As in the classification module, no time information is used to perform the recognition task. This recognition process is aimed at recognizing in a short term period, i.e. targets that become occluded for a few seconds or targets that merge for a few seconds and then split again. The models are characterized by the *pdf* estimates of the chosen feature space, in this colour case [11].

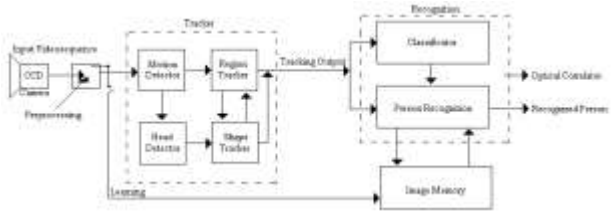

Fig. 3 System block diagram

4. ACTIVITY ANALYSIS:

Understanding human activity is one of the most difficult open problems in the area of automated video surveillance. Detecting and analyzing human motion in real time from video imagery has only recently become viable with algorithms. These algorithms represent a good first step to the problem of recognizing and analyzing humans, but they still have some drawbacks. Therefore the human subject must dominate the image frame so that the individual body components can be reliably detected

[10].

5. ONE SOLUTION FOR THE TRACKING SYSTEM:

The pan-tilt-zoom cameras are most to obtain detailed or fine-scale information about object of interest in the scene. The video from the static cameras is used to detect and track multiple objects in either two or three dimension. The fixed camera images can be used to extract additional information about at a course level, like object class (person, track, car), or object attributes (position of a person's head, velocity of a car, etc.). The information from the course and fine scale analysis is combined in the internal scene representation.

The pan-tilt-zoom cameras Worked are as follow:

Based on ubiquitous sensor network technology, the suggested mechanism obtains the object position in real time and supports PTZ camera control of the center of interesting object. In this intelligent video security surveillance system applied the suggested mechanism is realized and experiment environment which accept multiple objects and multiple cameras was created and tested with internal rectangle structure(18.3m x 8.8m), as shown in Figure 4.

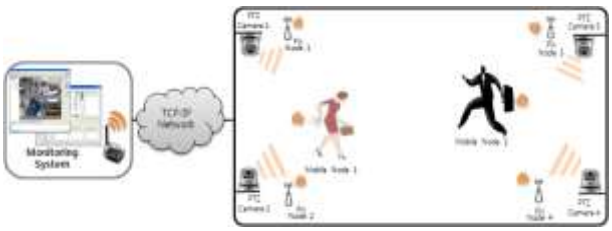

Fig. 4 PTZ Camera working

For the intelligent video surveillance system which was applied to intelligent multiple cameras in the suggested mechanism and video security system based on the existing fixed camera.

(1) Recording by movement recognition of objects: If an object is moved, recognize the movement and evaluate whether the movement can be taken by a surveillance camera.

(2) Time for record responding: If the movement of object is recognized, evaluate the time required until starting recording of interest objects by the surveillance camera.

(3) Amount of valid video information: In case the object movement is recognized, evaluate whether video information can be earned in various angles with more than two cameras.

(4) Video quality: Evaluate whether taken video information by surveillance camera is possible to distinguish with the naked eye with materials and people.

6. CONCLUSION:

Surveillance systems significantly contribute to situation control. Such systems transform video surveillance from a data acquisition tool to information and intelligence acquisition systems. In this paper, the various technique to improve video security surveillance system's problems, the new mechanism which can intelligently tracks and records interesting objects in multiple objects environment.

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