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Target Detection in Ongoing Video with SMS Alert, Compression Technique and Auto Swapping

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Abstract

Target tracking in video is a centric task in which the behavior of each target is analyzed separately, which requires a significant amount of human attention and is a computationally intensive task for automatic analysis. All dynamic load sharing methods provide better equalization than static methods. Usual streaming of entire videos, which could not able to identify the target object. Processor capacity is chosen to meet the timing requirement. In this paper, we model the target detection has automatic with the help of the processor and storing the movement of the target in the form of frames and images. This image is converted from the video captured by the web cams connected with the system. Due to the conversion of videos to frames more space to store the videos is reduces. This will help us to monitor and capture the videos of a particular target without any distraction. This paper will also demonstrate the auto swapping and compression technique. Experimental results show that the proposed model successfully captures the variability of the target tracking, and that the automatic target tracking provides better result than the dynamic load sharing methods.

Keywords—*Dynamic, equalization, target, tracking, workload*

I. Introduction

Object tracking is an important task within the field of computer vision. Proliferation of high-powered computers, the availability of high quality and inexpensive video cameras, and the increasing need for automated video analysis has generated a great deal of interest in object tracking algorithms. Actually, without this dynamic performance the system can not be applied in real time. Our goal is to make a real time tracking system and in this case we carefully consider the color, shape and non-linearity. Traditional surveillance system may be having a problem with the workload equalization; it's happen due to assignment of static cameras in the environment. Static camera most probably used for the video coverage and not for target tracking. Since it has also having some problem during the recoding of target centric force In order to meet the real-time requirements of Surveillance, it is necessary to distribute the video processing load over multiple hosts. In general, cameras are statically assigned to the hosts; we show that this is not a desirable solution as the workload for a particular camera may vary over time depending on the number of targets in its view. The processor capacity is chosen to meet the timing requirements when the workload from all the cameras is at its highest. This leads to an ineffective design as not all cameras reach that state simultaneously. There can be a situation when one processor is get-ting feeds with multiple targets in all the frames and another processor is receiving frames with no targets. Hence, the static camera assignment scheme does not allow for efficient resource utilization.

In earlier dynamic workload sharing method [1], the surveillance systems employ network based cameras which can transmit the video data over the network to any host this may leads to a problem of hacking by hackers. In the current automatic video based target tracking system, the systems which are connected with the webcams are dynamically assign themselves as server among any one of the system. From the server the videos which are converted as multiple frames can be monitored by human operator or a processor, or both. In these setting, it is very easy to monitor(or)target can be detected very easily. The storage of videos are also important in the emerging paradigm of target tracking based on videos. Here, we are using a technique known as dynamic or auto swapping technique. Dynamic swapping assignment requires an appropriate workload model which makes more memory storage for storing the videos as multi frames. For cost effective and efficient of the storage of videos, we need the characteristics of the swapping technique.

In this paper, we propose a background subtraction algorithm based multi target for surveillance systems. Different states of background subtraction tracks the no of targets and we are also proposes a dynamic swapping technique to

swap the videos which is converted as multi frames by compressing it with the help of run length encoding technique. The process depends on the environmental condition and it is found to be proportional to the storage of memory space where the storage of number of target takes place.

In sum, the two major contributes in the paper are: 1) the automatic video based target tracking which exploits the capturing of object detection, and 2) a dynamic swapping technique which helps to improve the memory storage capacity. The proposed work done in the following aspects 1) reference image extraction and image comparison which helps to identify the object target in the ongoing video 2)image comparison has done with the help of the background subtraction algorithm for the finding the new target 3) video storage has done for the future reference monitor 4) dynamic swapping takes place for maintaining the memory storage for the storing the ongoing video storage without any interruption.

5) compression technique takes place for the reduces the space and make use of stored videos for future reference without any damage for videos.

The paper is organized as follows: in Section II we review the related work. Section III the workload of the automatic video based target tracking was proposed. Producer of SMS alert in IV.

Dynamic swapping and compression technique is proposed in Section V with the methodology of the proposed system. We provide the experimental results in section VI and conclude the paper in Section VII.

2. Previous Work

Researchers have proposed various workload model in different contexts. Mukesh saini [1] proposed a dynamic load sharing method which equalizes the workload of processors to improve the surveillance performance. A background subtraction based hypothesis generation and appearance-based hypothesis verification. The problem of detecting and tracking of moving objects in the contexts of video surveillance. However, the model does not store the videos to monitor for future references. In our case the task of target detection depends on the number of targets. In contrast to the works described above, our model preserves the target detection as done comparing with the reference image. M.Valera and S.Velastin proposes [2] a surveillance system for the monitoring of persistent and transient within a specific environment. Real-time object tracking and classification using a static camera was proposed by swantje Johnson on people detection tracking Kobe.

Many video surveillance systems proposed for detecting and tracking moving objects for video surveillance. Fort Collins proposes a video stream relies on accurate detecting and tracking of the moving of the moving objects, and on the relationships of their trajectories to the scene. It also addresses the problem of detecting and tracking moving objects in the context of video surveillance. Scalable surveillance software architecture (fig 1) was also proposes the construction of large scale of large scale surveillance network software and explores the implications for instantiating surveillance algorithms at such a scale.

Alan M. M^{c}Ivor proposes [3] a Background Subtraction Technique is a commonly used class of techniques for segmenting out objects of interest in a scene for applications such as surveillance. This paper surveys a representative, the Sample of the published techniques for background subtraction, and analyses them with respect to three important attributes: foreground detection; background maintenance; and post processing. Department of college and technology St. Thomas college of engineering and technology proposes a run length encoding techniques on Efficient Lossless Color Image Compression for the heavy network traffic.

3. Work Load

The proposed model is used to find the target in ongoing video with the help of the reference image. The general architecture of proposed system has shown in Figure 1.

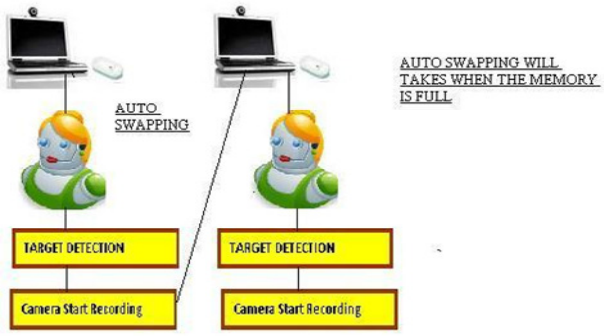

Figure 1 General Architecture of Proposed System.

Although surveillance systems are generally designed to observe human behavior, it is also used to find the new target which is appearing on the environment to which we are monitoring. The monitoring is generally done by the human operators. The human monitoring can done to a minimum of a 50 to 100 target approximately. So, human monitoring is a major drawback in dynamic workload equalization. For clarity, we will use the term targets to describe humans and other objects. The video based target tracking begins with the image.

A. Reference image and image comparison

We define a reference image, the reference images are captured by the web cameras which are connected with a system. Once the webcam starts, it starts capturing the images. The first image captured by the web camera is known as

reference image. The system which is assigned by that webcam will takes as reference image for that particular system. Here, the webcams starts capturing only the videos but we are converting it as multiple frames or images.

B. Target Detection

Once the reference images are stored in the system again the webcam starts record the ongoing videos. It will compare with the reference image. Once the videos that are recently taken had a slight difference from the reference image it start record it and the videos are converted it as multiple frames or images. So, it is known as target detection. The target detection has done with the help of the background subtraction algorithm.

C. Background Subtraction Algorithm

We are mainly using the Background subtraction algorithm in our proposed system for the target detection. Here the background subtraction algorithm helps us to find the newly entered objects in our system. The working principle of the background subtraction in our proposed is follows: 1) When the comparison takes place it will compare the background present in the reference image. 2) The changes will identify with the help of the background only. So, it will take a vital role in our proposed. The working principle of the background technique used in our proposed are mainly extract from Alan M. M^{c}Ivor Reveal Ltd, New Zealand [3].

D. Video storage

Once the new object has been detected with the help of the background separation algorithm, each and every movement of the object will be stored. The storage technique will takes place when any movement has been detected in the object target tracking when comparing with the reference which is already stored the system. When there is no movement or changes occur in the video compared with reference frame or image the storage will not takes. It is very useful in the part of less memory storage and fast memory access. The video which are stored is also very much useful for the future reference. Example: as a evidence for the future arguments. The propose system will be leads to a technique known as dynamic swapping and compression technique. it is very much useful for the storage of videos in the form of frames or images without any damage to the original image for the future reference.

E. Sms Alert

SMS Alert is used in an efficient way in our paper. It is done with the help of PC Suit. It takes place when an object or target is entered into our room where more security is needed. It also gives us intimation when the target is doing some action in our secured surrounding. The short message service will send to the mobile number which the number we have entered in our coding.

4. Compression Technique and Dynamic Swapping

A. Compression Technique

The Compression is one of the important techniques in the process of storing of videos as frames. The compression may takes place before the dynamic swapping technique. This is important because the frames which are by the webcams are compressed together to reduce the memory space for storing the videos. So, it will improve the memory capacity, if the absence of human operator. The compression in the proposed system takes place with help of Run Length Encoding Technique Proposed by Debashis Chakra borty, Soumik Banerjee. The model of Compression Technique RLE has shown in the (Extract from Efficient Lossless Color Image Compression Using Run Length Encoding and Special Character Replacement) Figure 2.

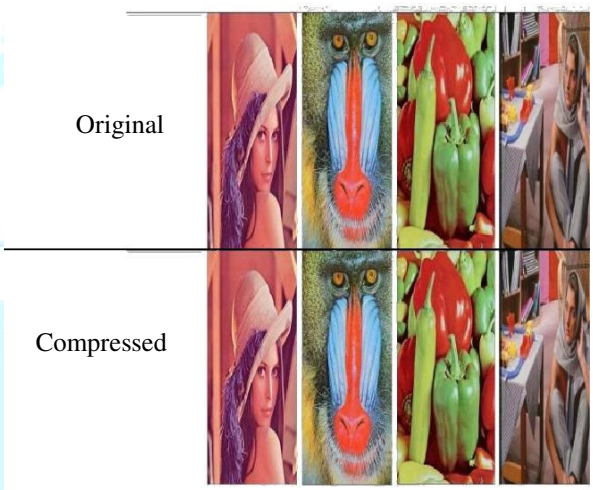

Figure 2. Proposed Model of Compressed Technique*

B. Dynamic Swapping

We are proposing a new technique in our papers which are not given important in dynamic load sharing equalization. The dynamic swapping technique is mainly used for minimize the memory capacity for storing the videos. This technique mainly implanted where security is important and efficient. It will takes place at the night time for security purposes. The workload will takes place in the following 1) Once the webcam capture the videos and converting it to

multiple frames and images are stored in particular folder. 2) At one stage the memory capacity will be full and there will be no space to store the frames of technique takes place. 3) Any one of the system which are connected with the webcam are dynamically assign themselves as server and the system which is full without any space to store the videos will swap the data automatically to the server and storage process will takes place automatically without any interruption. In any other surveillance system this problem is not noticed. Due to this technique there is no need of deleting the previous videos and no need to stop the storage of future or ongoing videos. This will be useful for the future reference, the working model of dynamic swapping in illustrated in the figure 4.

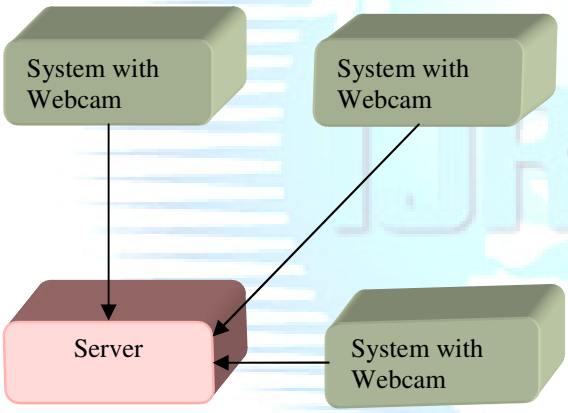

Figure3. Model of Dynamic Swapping

C. Methodology of Proposed System

The Configuration for the proposed Shown in Figure4.

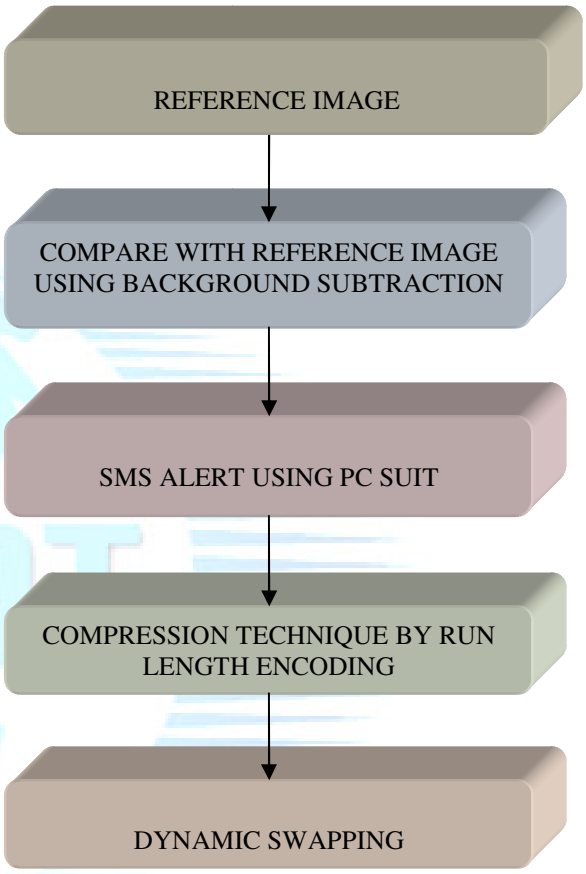

Figure4. Automatic Video Based Target Tracking with Dynamic Swapping and Compression Technique

5. Experiment

In the experiment, we demonstrate the advantage of the proposed automatic vidoe based target tracking method. We simulate a distributede surveliance system with 20 system and assigned with 20 webcams. All the system processors are assumed to be equal power. We use four perfoemance measures to evaluate our methods . 1)Reference image 2) Comparison with the reference image with background subtraction algorithm 3) Dynamic swapping and 4) Comression technique. The experiments are divided into three parts. In the first experiment, we show the different background models (Section V-A). the second experiment provides memory allocation techniques in system with dynamic swapping (Section V-B). In the third experiment, we show how compression technique takes place with the help of run length encoding technique (Section V-C).

Finally we compare the most favor automatic video based target tracking with dynamic swapping and compression technique with dynamic workload assignment method.

A. Effects of Background Subtraction Technique

Background Subtraction is a commonly used class of techniques for segmenting out object of interest in scene for application such as surveillance. We extract the working principle of Background Subtraction technique proposed by Alan M. McIvor*[3], who analysis then with respect to the important attributes: Foreground detection; Background maintenance and Post processing.

B. Evolution of Dynamic Swapping Method

Dynamic swapping techniques which are used by us in our proposed system have done with the memory allocation Oh, Hung Lye [6] at SC field application. Texas instrument Singapore, with an simple swapping code with fewer points to remember and concluded the proposed system with possible of creating a structure that allows dynamic swapping of application during runtime. The modules should use as few global and static variables as possible that should be programmed on a predefined memory and can be easily integrated without the need to repeatedly swap modules.

C. Evaluation of Compression Technique

Compression technique in our proposed system was done with help of the Run Length Encoding Technique proposed byDebashis Chakraborty, Soumik Banerjee [7]. Proposes an individual channel matrices were retrieved and used for processing. Firstly each matrix was scanned row-wise for identifying repetitive pixels. Each group of such repetitions were then replaced by the pixel value and the frequency of occurrence. This was done exhaustively throughout the image matrix. For single occurrence of a particular value frequency was not used because that would cause an overhead affecting the compression efficiency.
Sample processing example:
Input stream: 22 22 22 57 57 57 53 33 33 33 33 22
Output stream: 322 457 533 22

The output stream produced a series of frequency- pixel value pairs as previously discussed. This new representation of original matrix information for individual matrices was forwarded to the next section for processing.

D. Comparison with Dynamic Camera Assignment Method

To summarize, in the experiments, we compare the automatic video based target tracking system with the dynamic camera assignment. For target detection we use background subtraction and for memory storage dynamic swapping and compression technique. Table I provide the comparison of the results. With these results, we can conclude the automatic video based target tracking method provides better results than dynamic camera assignment method for the storage of videos and in memory capacity

Table I. Comparison of Dynamic and Automatic System

Methods	Target Tracking	Video Storage	Memory Capacity	Human Monitoring
Dynamic Camera Assignment	Yes	No	No	Yes
Target Detection in ongoing Video	Yes	Yes	Yes	No

6. Summary, Conclusions, and Future work

Automatic video based target tracking with auto swapping and compression technique can be used for detecting the target with each and every action performed by the target in the surveillance and monitoring technique. It is also useful for minimize the human monitor. In the part of surveillance and monitoring system the automatic video based target will be helpful for reduces the multiple object target detection. Here, Back Subtraction algorithm plays a vital role. It is only technique used for the comparing the ongoing videos. The video storage will takes an important role here due to the need of future references. It will take place with the help of compression and auto swapping techniques. The compression technique takes place with the help of the Run Length Encoding technique. It is useful for the storing of frames in a compressed form for minimizing the memory to record more frames. The swapping technique which is useful for dynamical swapping from one system to another or one server to another server without any disturbance for the storing of ongoing videos. It is also use for the future reference if any technical error occurs in the system or during the recoding phase. The future extension include a secured video based target tracking in a large scale sector which will in build with a particular object target and its actions in the environment or movement will be stored. It is also planned to extract individual target action, to be stored in the separate memory storage for future reference. This will be useful for knowing each and every target action that will takes places in public environment. Further we can demonstrate the need of user for a particular target action by sending their request to the server by registering their details. For example, it would be interesting by applying this model in spatial group

configuration as a new social force feature for addressing the challenges of crowd tracing.

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