ISSN 2348-375X

Unique Journal of Engineering and Advanced Sciences

Available online: www.ujconline.net

Research Article

ADAPTIVE VISUAL TRACKING FOR HUMAN DETECTION

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Received: 15-02-2014; Revised: 14-03-2014; Accepted: 12-04-2014

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ABSTRACT

Object detection is one of the fundamental step for automated video analysis in many vision applications. Object detection in video is usually performed by background subtraction techniques. In the existing method they proposed object detection by pixel variation of the image from one frame to another and the background subtracted by the training process in the recorded videos. In the proposed method the object is detected in the live video that is used for the security purpose. Camera is fixed at the required place and if there is any human object is detected, it is processed and makes the system to realize and produces the alerting sound at the same time intruder's image get transferred to the corresponding authority through mail communication. The mailing system is composed with a counter, which sends the images of the coverage area at regular intervals. Based on the Camera's range the monitoring area may be increased. In live video 18 frame is processed at a unit time and it takes again 18 frames to process output. In existing system they took 86 seconds to process 1 frame. Proposed method going to achieve 10 frames/sec.

Keywords: Frame Matching Algorithm, Object Detection, Visual Tracking, Mail communication.

INTRODUCTION

The first generation of video surveillance systems (1980's) is the traditional analog closed-circuit television (CCTV) network. In the system, analog video cameras are connected by coaxial cables to surveillance screens for monitoring by human operators or the cameras could be connected to videotape recorders for archiving purposes[1].

The second generation video surveillance (1990's) replaced the videotape recorder with a digital video recorder (DVR) with the data archived on hard drives. More recent systems have network connections so the video data can be stored on servers[2].

The third generation is an IP network system, where the data is continuously being transmitted over the network.

The massive amount of data involved makes it infeasible to guarantee vigilant monitoring by human operators for long periods of time due to monotony and fatigue. As a result, video feeds are usually archeived for forensic purposes in the event suspicious activities take place. In order to assist human operators with identification of important events in videos, an "intelligent" visual surveillance system can be used. Such a system requires fast and robust methods for moving object detection, tracking, and event analysis[3].

In automated video analysis object is detected by using many techniques such as active contour based, dimensional based etc., in real time security system there are many advanced systems available. Those systems are mostly embedded systems and much hardware specification has to meet the efficient security system. Many surveillance cameras are installed in security sensitive areas such as banks, train stations, highways, and borders. The massive amount of data involved makes it infeasible to guarantee vigilant monitoring by human operators for long periods of time[4].

In this project the human object is captured, data bases about the pixel values are trained to the system. Video Camera is fitted at the bank where security is needed. Whenever human movement is captured by the camera it is immediately detected and processed to make the alarm to produce sound. Investigation methods for moving object detection, tracking, and event analysis. Consider robustness and computational cost as the major design goals of our work. Our proposed method detects moving objects in required environments under changing illumination conditions and in the presence of background dynamics. Also present a fast implementation of the method using an extension of integral images[5].

RELATED WORK

Numerous studies in the literature have proposed soltutions to tracking the objects. Xiaowei Zhou[1] and his members used DECOLOR method to detecting the object. There are three key steps for automated video analysis Object detection,

Object tracking, and Behavior recognition. It can work effectively on a wide range of complex videos. All the above process done in recorded videos not in the live videos[6].

Liyuan L, Weimin Huang[2] states the background modeling for foreground object detection in complex environments. The drawbacks of this method is the statics are related to each individual pixels without considering its neighborhood, the method can wrongly absorb a foreground object into the background if the object remains motionless for long time duration[7].

Shi-qi Xing[3] decompose the manmade objects that captured in the radar undergoes 3-D reconstruction. There are two techniques are proposed in this paper, they are multiple measurement vector compressive sensing, and regularization theory. The effects of polarization that multiple polarization measurements provide much more information about the targets.

Weiming Hu, Xue Zhou[4] are states frame work based on the contour based object detection. the process involved in color based, shape based, dynamical shape based and pso based. It deals effectively with contour tracking for videos with abrupt motions.It outperform the process by using particle filter method.

Hsu-Yung Cheng[5] deals with automatic vehicle detection system for aerial surveillance. There are two methods are used .those are region based and sliding window based. In this paper included color based and local features.

Wei te li, haw shiuan chang[6] to separate foreground and background regions within and across video frames based on visual and motion saliency information. a conditional random field is applied to videos and combine features and find out any variations in the object.

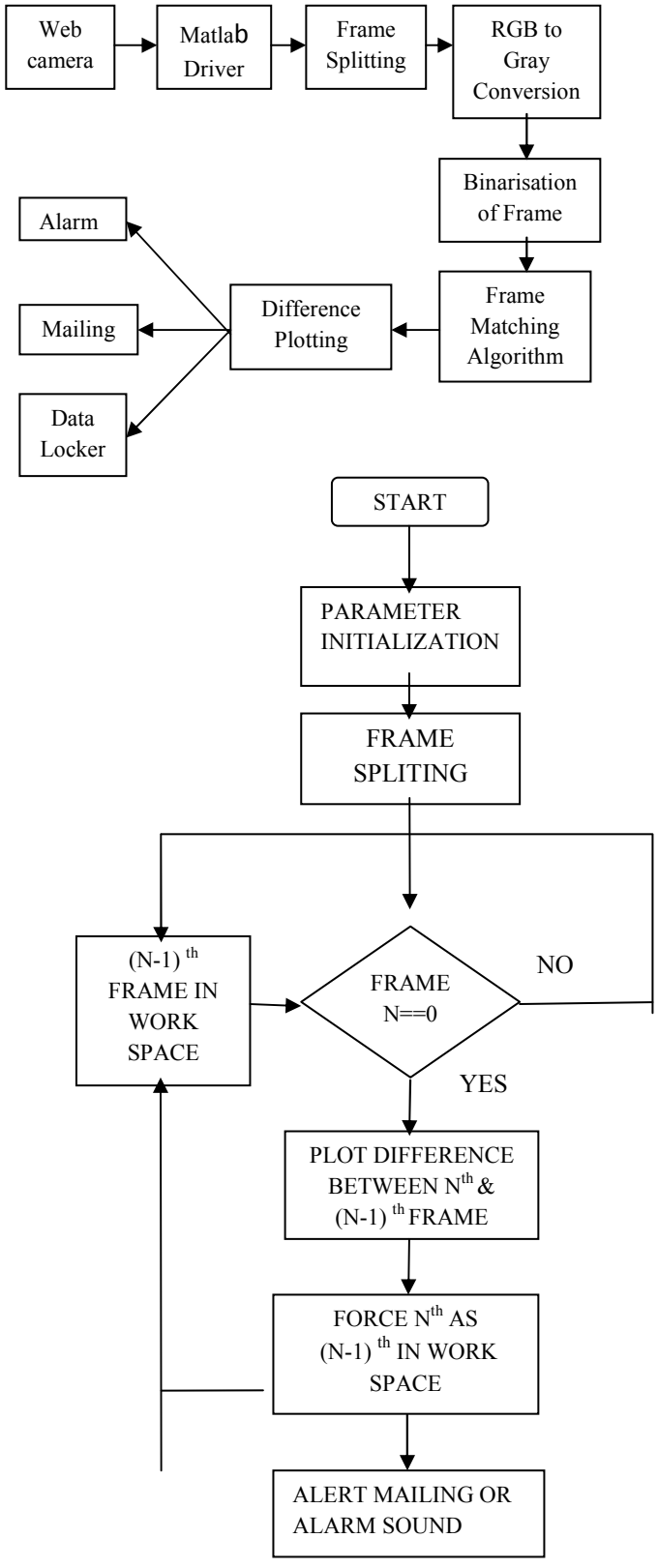
Sen Ching[7] compares various background subtraction algorithms for detecting vehicles in a video. The techniques are frame differencing and adaptive median filtering[8].

METHODOLOGY

The Video Is Captured Using Matlab drivers through web camera.the videos are
continuous form so split the videos into frames by means of pixel size. human perceive color through wavelength sensitive sensory called cones. There are three different types of cones, each with different sensitivity to light of different wavelength. One type of cone is mainly sensitive to red light, one to green and one to blue. Therefore three color images stored in three different matrices. One stores the amount of red in each pixel, one storing the amount of green and another storing blue according to each pixel. Such color images are stored in a RGB format. Where us in gray scale, we differentiate total amount of emitted light for each pixel. Little light gives dark pixel and much light gives bright pixels.

RGB to gray scale conversion we have to take the RGB values for each pixel and make as output a single value reflecting the brightness of that pixel. One such approach is to take the average of the contribution from each channel.

After splitting the frames, the frames are compared with the previous frames. The previous frames are stored in the workspace. Every time the previous frames will be varied. According to frame matching algorithm the N th and (N-1) th frames are matched just force to that frame into workspace.



If we keep track of the intensity values of a single pixel over time, with no background movement, the intensity can be modeled with Gaussian kernel, given that the image noise, over the same time, can be modeled by a Gaussian distribution with zero mean.

There are at least two reasons why a pixel's intensity value changes. Firstly, different Objects are projected to the same pixel at different times. Secondly, the pixel can be a Projection of the same objects, but may change as a result of image blurring.

The kernel bandwidth indicates the local variance in pixel intensity because of the local variation from image blur and not the intensity jumps (when different objects are projected to the same pixel). The local variation may change over time and can also differ between color channels. Next centroid is initialized and then using clustering method the changes will be identified.

Otherwise any differences between frames plot the difference between frames and make alert sound or mailing to control room.

RESULTS AND DISCUSSION

The MATLAB programming window is opened. By clicking the file new editor window is opened.

The editor window is shown below, where the program is typed to feed the program and to simulate the result.

The output window will be generated when we run the program the output will be as shown below. Here we have to click upon the VIDEO button.

When we click the video button the image is captured and matching the frames.

Whenever the human object is appeared it is detected by using the algorithm.

Finaly if any changes occur between the frames makes the alarm at the same time send corresponding messages to the control room immediately

In the existing system[6] takes 86 secs to process a single frame in the recorded videos but in our system takes 10 secs to process a single frame in live videos.

In previous systems [6] the pixel size is 320*240 but in our systems the pixel size is1280*720(it is based on camera type).

The resolution of our system is 12 times higher than existing

systems. In previous systems use our pixel size it takes 17 minutes to process a single frame.

CONCLUSION

The proposed method improves the efficiency and reduces cost and time consumption in the security system. Especially to implement in the banks, jewelry shops etc., with the use of frame matching algorithm, here object is detected in an efficient manner and comparing to the existing system the number of frames processed per second is improved.

If any changes occur between the frames and mail to respective authorities and police station. Here we process the frames based on color video signal in future we compare the processing time between color video signal and gray video signal and also in future low rank model from beginning frames may be updated online when new frames arrive.

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Source of support: Nil, Conflict of interest: None Declared