



## INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

### Alarm Triggering for Motion Detection and Image Compression Scheme for Video Surveillance

Ms.Deepika.T<sup>\*1</sup>, Dr. Srinivasa Babu.P<sup>2</sup>

<sup>\*1</sup> PG Scholar, Department of CSE, Adhiyamaan College of Engineering, Hosur, India

<sup>2</sup>Professor, Department of CSE, Adhiyamaan College of Engineering, Hosur, India

[deepikaselvam10@gmail.com](mailto:deepikaselvam10@gmail.com)

#### Abstract

The security involve have grown enormously in today's competitive environment. In the modern world, ownership is known to be 9/10'ths of the law. Hence, it is necessary for people to protect one's property from harms such as thefts, destruction of property, people with spiteful plan etc. Due to the advancement of technology, the techniques used by thieves and robbers for taking another's property without permission have been increased. Therefore it is necessary to improve the surveillance techniques. The latest technologies used in the fight against thefts and destruction are video surveillance and monitoring. However, so far the technologies require large amount of memory to store the video. Therefore, we have developed a methodology to detect the motion in a video stream environment. Once a motion has been detected in the live stream, the software will activate a warning system and capture the frame if moving object is present in that frame for each and every movement.

**Keywords:** Motion, Video Stream, Surveillance, Frame.

#### Introduction

Moving Objects Detection and Image Compression are widely used low-level tasks in many computer vision applications, like surveillance, monitoring, robot technology, object recognition etc. Many approaches have been proposed for moving object detection and image compression from videos, mainly dedicated to human monitoring and visual surveillance.

Although the exact requirements vary between surveillance systems, there are issues that are common to all. Usually, an operator is interested only to detect certain objects in the scene. For example, in surveillance of a public area, one may be interested only to monitor the people within the scene rather than the entire scene in the area.

In general motion detection methods are classified broadly into three main categories: Background Subtraction, Temporal Differencing and flow based. Our approach is background subtraction. Detection of moving objects in video streams is the first stage in any video surveillance system. Aside from the intrinsic usefulness of being able to segment video streams into foreground and background components, detecting moving objects provides a focus of attention for activity analysis, making these later processes more efficient since only "foreground" pixels need be considered.

Nowadays, the size of storage media increases day by day. Although the largest capacity of hard disk is about 2 Terabytes, it is not enough large if we store the video file without compressing it. Image Compression aims to describe the process of storing the image with less number of bytes in digital memory by removing the redundancy from the image. Digital Images are stored with BMP, TIFF, GIF, JPEG formats.

Some of the relevant works in the field of motion detection and image compression is mentioned in the following section. This paper is organized as follows. Section 2 describes the related work. Section 3 briefly describes the proposed methodology. Section 4 deals with the experimental results. Section 5 includes the conclusion and future enhancement.

#### Related Work

We survey the techniques and method relevant to motion detection, specifically approaches that detect the moving object. For accurate detection, the motion must be accurately detected using suitable methods, but they are affected by a number of practical problems such as shadow and lighting change over time. Many researchers have given their contributions to Motion based object detection under

indoor scenes and provide solutions to the above mentioned problems. Asif Ansari et al. [2] proposed a motion detection system which provides an efficient method for surveillance purposes and provide the user a facility to use an audio file as alarm signal.

In [3], motion detection and object tracking method which is simple and direct with which the changing part in video can be quickly detected. K.Amaleswarao et al. [4] proposed a temporal differencing to detect the moving object and give the alarming in time and produces high accuracy. This method is a fast and achieve better detection performance. Motion Detection and Object Tracking [5] is a popular technique which is robust against the complex, deformed and changeable shape. This method is scale and rotation invariant, as well as faster in terms of processing time.

In [6], temporal differencing approach which is robust statistical activity recognition used for modelling activities. G.L.Foresti et al. [7] proposed a motion segmentation method to detect with high accuracy the motion inside the monitored scene. In [8], motion detection approach will reduce the unwanted recording of surveillance videos. This method consumes low power. In [9] background subtraction technique are used to detect the moving object and then remove the shadow in subsequent phase.

Kauleshwar Prasad et al. [10] proposed a motion detection method which provides a less noise. This method scan from top to bottom for detecting the presence of an object. Lucia Maddalena et al. [11] proposed a background modelling which makes the neural network structure much simpler. This method is able to detect foreground objects against new backgrounds. In [12], change detection method are used to analyze temporal information between successive frames to obtain the change region. This method is low computational load and system complexity. In [13] Pranab kumar dhar et al, employ motion detection based approach to detect object more accurately from input image and has manual threshold selection. Shin-Min Chao et al. [14] proposed a background subtraction method that can effectively extract motion objects and is less sensitive to illumination change.

### Proposed Methodology

In this section, we present a novel real time motion detection approach for static-camera surveillance scenarios. Our approach achieves complete detection of moving objects and involves four proposed modules: an absolute differencing (AD) module, an alarm trigger (AT) module, an

object extraction (OE) module, and JPEG conversion module. A system block diagram of our proposed method is shown in fig. 2.

#### a. Absolute Differencing

1) **Frame Sampling:** To obtain the frames captured from the original video and compute the average number of frames.

2) **Background Modeling:** It is used to obtain the current background. For each pixel  $(x,y)$ , the corresponding value of the current background model  $B_t(x, y)$  is calculated by the following formula:

$$B_t(x, y) = B_{t-1}(x, y) + 1/t (I_t(x, y) - B_{t-1}(x, y))$$

(1)

Where  $B_t(x, y)$  is the previous background model,  $I_t(x, y)$  is the current incoming video frame,  $t$  is the frame number in the video sequence.

3) **Differencing:** For checking whether any motion is present in the video, we compare the current frame from the original video with current background obtained from background model so that we can detect changes in these frames and hence predict the occurrence of some motion.

#### b. Alarm Trigger

After the differencing is produced via the background model procedure at each frame, it will indicate the alarm to the user about the moving object. This alarm system immediately activates the audio alarm signal if any kind of motion is detected. This helps in preventing any kind of cracking of security at that moment of time.

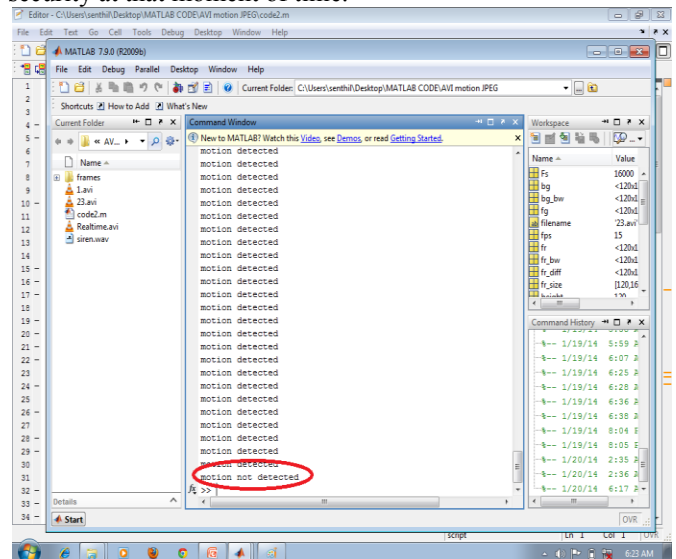


Fig. 1. Alarm Indication

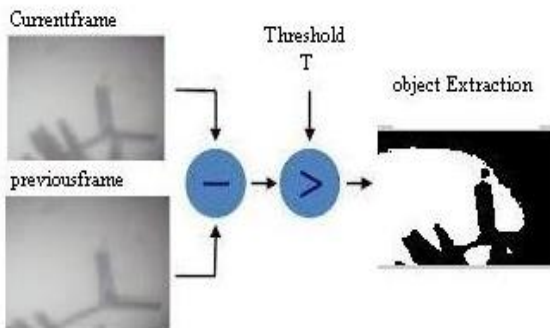
**c. Object Extraction**

This module is used to process only block containing moving object by using effective threshold selection algorithm. Tracking is a significant and difficult problem that arouses interest among computer vision researchers. The objective of tracking is to establish correspondence of objects and object parts between consecutive frames of video.

It is a significant task in most of the surveillance applications since it provides cohesive temporal data about moving objects which are used both to enhance lower level processing such as motion segmentation and to enable higher level data extraction such as activity analysis and behavior recognition.

Tracking has been a difficult task to apply in congested situations due to inaccurate segmentation of objects. Common problems of erroneous segmentation are long shadows, partial and full occlusion of objects with each other and with stationary items in the scene. Thus, dealing with shadows at motion detection level and coping with occlusions both at segmentation level and at tracking level is important for robust tracking.

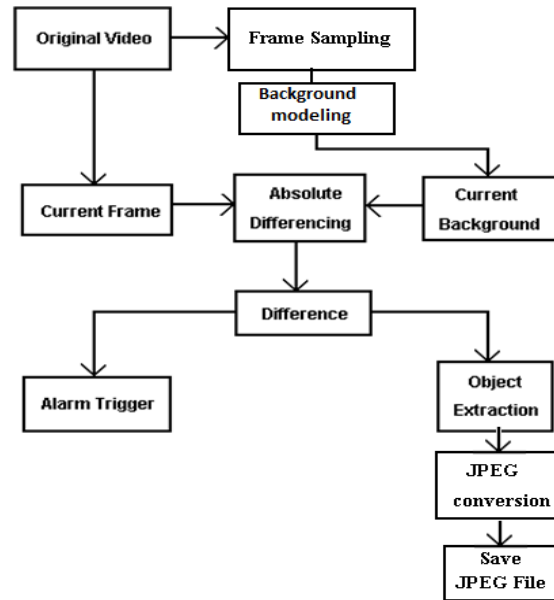
Tracking in video can be categorized according to the needs of the applications it is used in or according to the methods used for its solution. Whole body tracking is generally adequate for outdoor video surveillance whereas object's part tracking is necessary for some indoor surveillance and higher level behaviour understanding applications.



**Fig. 2. Result of object extraction**

**d. JPEG Conversion**

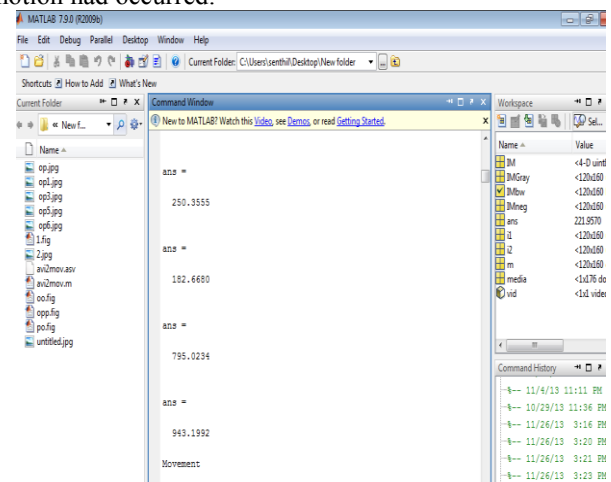
After detecting the moving object in the video frames, it will take snapshot of the frame. Normally video is in .avi video format so it is converted into JPEG format. To store the captured image using JPEG file.



**Fig. 3. System block diagram of motion detection and image compression method**

**Experimental Results**

From the experimental data, we clearly explain that the change in the pixel Variant means motion had occurred from the current frame to previous frame. We also inferred if the pixel variant zero from the current to previous frame then no motion had occurred.



**Fig. 4. Output for detect the moving object**

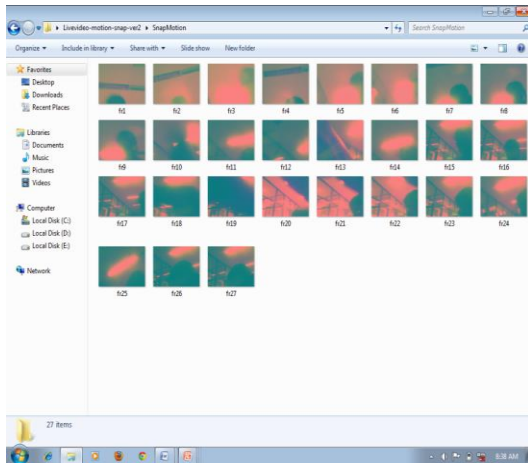


Fig. 5. Image Compression Results

## Conclusion

Various existing motion detection algorithms available to video surveillance systems are studied. But in most of the algorithm that does not completely detect the moving object because it causes some shadow and it requires large memory to store the video. The studies proved that the initial object mask problem are responsible for shadow present in the detecting moving object it will lead to degrade the accuracy of the system whereas the noisy region is dominant part of accuracy degradation. In our proposed scheme therefore, a best motion detection algorithm must be made for detecting the moving object without present of shadow, particularly for banking applications to improve the security. Furthermore, include an option to take snaps periodically, manually or automatically to store the image with less number of bytes. In future, it will implement in real time video surveillance system with pixel variant results for each movement in the frame.

## References

- [1]. Shih-Chia Huang "An Advanced Motion Detection Algorithm with Video Quality Analysis for Video Surveillance Systems" in the *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 21, No.1, January 2011.
- [2]. Asif Ansari, T.C.Manjunath., C.Ardil "Implementation of a Motion Detection System" in the *International Journal of Electrical and Computer Engineering*, 2008.
- [3]. khil D. Gotmare, M.Sambath, S.Ravi "Tracking And Recognizing The Moving Object In Real Time Using Frame Difference Method" in the *International Conference on Advanced Engineering & Technology*, 10<sup>th</sup> March Chennai.

- [4]. K.Amaleswarao, G.Vijayadeep, U.Shivaji "Improved Background Matching Framework For Motion Detection" in the *International Journal of Computer Trends and Technology*, Volume-4, Issue-8, August, 2013.
- [5]. M.Besita Augustin, Mrs.Sujitha Juliet, Mr.S. Palanikumar "Motion And Feature Based Person Tracking In Surveillance Videos" in *PROCEEDINGS OF ICETECT 2011*.
- [6]. M.Elarbi-Boudihir, Khalid A. Al-Shalfan "Intelligent Video Surveillance System Architecture for Abnormal Activity Detection" in the *IEEE Trans. Communications*, 2011.
- [7]. G.L.Foresti, C.Micheloni and C.Piciarelli "Detecting Moving People In Video Streams" in the *IEEE Trans. Communications*, 2005.
- [8]. V.B. Jagdale, R.J. Vaidya "High Definition Surveillance System Using Motion Detection Method Based On FPGA DE-II 70 Board" in the *International Journal of Engineering and Advanced Technology*, Volume-2, Issue-2, December-2012.
- [9]. Kalyan Kumar Hati, Pankaj Kumar Sa and Banshidhar Majhi "LOBS:Local Background Subtractor For Video Surveillance" in the *IEEE Trans. Communications*, 2012.
- [10]. Kauleshwar Prasad, Richa Sharma and Deepika Wadhvani "A Review On Object Detection In Video Processing" in the *International Journal of Science and Technology*, Vol. 5, No. 4, December, 2012.
- [11]. Lucia Maddalena and Alfredo Petrosino "A Self-organizing Approach To Detection Of Moving Patterns For Real-time Applications" in *Springer*, 2007.
- [12]. Mrs. Megha V. Gupta, Dr. S.D. Sawarkar "Change Detection based Real Time Video Object Segmentation" in the *IEEE International Journal of Engineering Research and Technology*, Vol.1 Issue 7, September, 2012.
- [13]. Pranab Kumar Dhar, Mohammad Ibrahim Khan, Ashoke Kumar Sen Gupta, Anna Maria Vegni and Rashid Mehmood "An Efficient Real Time Moving Object Detection Method for Video Surveillance System" in the *International Journal of Signal Processing, Image Processing and Pattern Recognition*, Vol. 5, No.3, September, 2012.
- [14]. Shin-Min Chao, Du-Ming Tsai "Motion Detection Using Independent Component Analysis" in the *IEEE Trans. Communications*, 2006.
- [15]. Ashish Kumar sahu, Abha Choubey "A Motion Detection Algorithm for Tracking of Real Time Video Surveillance " in the *International*

*Journal of Computer Architecture and Mobility*  
Volume 1-Issue 6, April 2013.

- [16]. Moiz A. Hussain, G. U. Kharat “Robust Human Motion Detection and Tracking In Dynamic Background “ in the *International Journal of Soft Computing and Engineering, Volume-2, Issue-6, January 2013.*
- [17]. M.Sivarathinabala, S.Abirami “ An Intelligent Video Surveillance Framework for Remote Monitoring” in the *International Journal of Engineering Science and Innovative Technology , Volume 2, Issue 2, March 2013.*
- [18]. Neelam Patel “Motion Detection based on Multi Frame Video under Surveillance System “ in the *International Journal of Emerging Technology and Advanced Engineering, Volume 2, Issue 1, January 2012.*
- [19]. Sreedevi M, Yaswanth Kumar Avulapati, Anjan Babu G “Real Time Movement Detection for Human Recognition” in the *Proceedings of the World Congress on Engineering and Computer Science, Vol I, October – 2012.*
- [20]. Abhishek Kumar Chauhan, Deep Kumar “ Study of Moving Object Detection and Tracking for Video Surveillance” in the *International Journal of Advanced Research in Computer Science and Software Engineering, Volume 3, Issue 4, April 2013.*