# Algorithm for Person Detection in Adaptive Background using Matlab Platform

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***Abstract— Detection of motion is the first essential process in the extraction of information in moving objects and makes use of stabilization in functional areas, such as tracking, classification, recognition, and so on. In this paper, we propose an approach to motion detection for the automatic visual surveillance system. Our method achieves complete detection of moving objects by involving three significant proposed modules: a background modeling module, a trigger module and an object extraction module. For our proposed first module, a unique two-phase background matching procedure is performed using rapid matching followed by accurate matching in order to produce optimum background pixels for the background model. Next, our proposed trigger module eliminates the unnecessary examination of the entire background region, allowing the subsequent third module to only process blocks containing moving objects. Finally, we get a moving object with subtracted background.***

***Index Terms—detection, extraction, surveillance, trigger.***

## I. INTRODUCTION

This Visual surveillance is an active research topic in computer vision that tries to detect, recognize and track objects over a sequence of images and it also makes an attempt to understand and describe object behavior by replacing the aging old traditional method of monitoring cameras by human operators. A computer vision system, can monitor both immediate unauthorized behavior and long term suspicious behavior, and hence alerts the human operator for deeper investigation of the event. The video surveillance system can be manual, semi-automatic, or fully-automatic depending on the human intervention. In manual video surveillance system, human operator responsible for monitoring does the entire task while watching the visual information coming from the deferent cameras. It is a tedious and arduous job of an operator to watch the multiple screen and at the same time to be vigilant from any unfortunate event. These systems are proving to be in effective for busy large places as the number of cameras exceeds the capability of human experts. Such systems are in widespread across the world. These systems use lower level of video processing, but much of the task is done with the help of human operator intervention. In the fully-autonomous system there is no human intervention and the entire job is being done by the computer vision. These systems are intelligent enough to track, classify, and identify the object. In addition, it reports and detects the suspicious behavior and does the activity recognition of the object.

### A. Commercial and public security:

Monitoring busy large places like market, bus stand, railway station, airports, important government buildings, monuments, banks for crime prevention and detection. In all these busy places there is a large number of inflows and outflows of people in different multiple cameras take place.

**Fig. 1.1 Public Security**

### B. Military security:

Surveillance in military headquarters, access control in some security sensitive places like military arms and ammunition store, patrolling of borders, important target detection in a war zone is done with surveillance systems.

**Fig. 1.2 Military Security**

### C. Traffic surveillance:

In urban environments monitoring congestion across the road, vehicle interaction, Detection of traffic rule violation such as vehicle entry in no-entry zone, illegal U-turn can be done with visual surveillance systems. The camera records the entire event and then latter the culprit can be booked on this evidence.

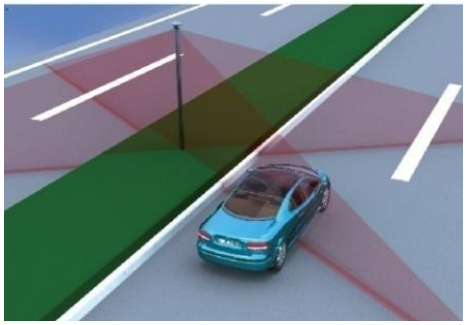

**Fig. 1.3 Traffic Security**

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## II. METHODOLOGY

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### 1) Background modelling

Initial Background Model The modified moving average is used to compute the average of frames through the initial background model generation. For each pixel the corresponding value of the current background model is calculated.

In order to reduce frame storage consumption, the initial background model adopts the calculated average. This is accomplished by making appropriate use of MMA which holds only the last background model and the current incoming video frame during the calculation procedure.

### 2) Alarm trigger

Module After the background model is produced via the BM procedure at each frame, the absolute difference is generated by the absolute differential estimation between the updated background model and current incoming video frame.

In order to significantly accelerate the following extraction module, we propose that the trigger module be comprised of a stepwise procedure involving novel block-based entropy evaluation followed by block-based morphological operations. Detection of each possible motion block candidate is accomplished by the proposed block-based entropy evaluation.

### 3) Extraction Module

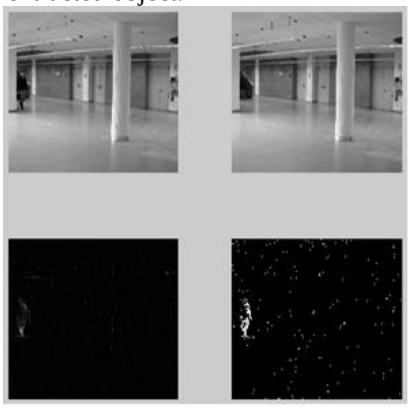
The detection of moving objects can be achieved through the observed change in gray-level illumination of the obtained motion blocks within the absolute difference. However, the critical challenge is obtaining a suitable threshold for initialization. To solve this problem, we propose the effective threshold selection algorithm for use with the extraction module in order to produce the binary motion detection mask.

### 4) Motion Detection

In this section, we present a novel motion detection approach for static-camera surveillance scenarios. Our approach achieves complete detection of moving objects and involves three proposed modules: a background modeling module, a trigger module, and an object extraction module. Initially, the proposed BM module designs a unique two phase background matching procedure using rapid matching followed by accurate matching in order to produce optimum background pixels for the background model. In order to drastically reduce the computational complexity of the motion detection process, we propose using an trigger module. This module consists of a novel block-based entropy evaluation method developed for the employment of block candidates, after which the most likely moving objects within the motion blocks are determined based on block based morphological erosion and dilation operations.

## III. RESULT

This section very briefly outlines the automatic object detection and tracking system for video surveillance that we have tested. The video surveillance system consists of a background generation module coupled with object detection, alarm trigger module and tracking modules. This allows us to provide a convenient user interface for testing various combinations of object detection and tracking modules. We have tested object detection modes and tracking modules for our visual surveillance system. The first mode is actual current frames , second mode is current background ,third mode is difference of current frame and current background and fourth is extracted object.



**Fig(a) Motion detected frame at i = 88**

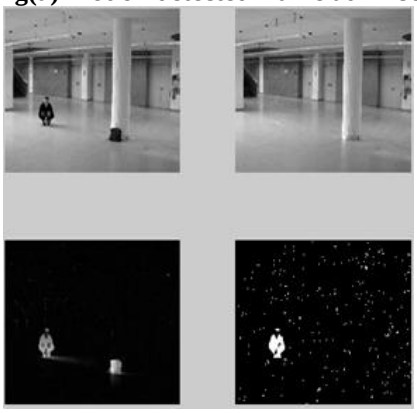


**Fig.(b) Motion detected frame at i = 88**

**Fig (c) Motion detected frame at i = 88**

## IV. CONCLUSION

The Surveillance systems significantly contribute to situation control. Such systems transform video surveillance from a data acquisition tool to information and intelligence acquisition systems. Real-time video analysis provides surveillance systems with the ability to react to an activity in real time, thus acquiring relevant information at much higher resolution. Despite the importance of the subject and the intensive research done, background detection remains a challenging problem in applications with difficult circumstances, such as changing illumination, waving trees,

water, video displays, rotating fans, moving shadows, inter-reflections, camouflage, occasional changes of the true background, high traffic, etc. Simplistic, static-background models cannot solve such problems. Some are very computationally extensive and cannot be used in applications requiring real-time operation. Our system prevents from entering forbidden person to secure zone or leaving the suspicious luggage in a guarded room. In this mentioned luggage or package could be bomb gun, drugs, etc. In the other case, the task can be to checking if someone is stealing the luggage, package or the other value things. Our system will increase security of employees and the other people in schools, stations, airports, etc.

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