

### FINAL REPORT CSE404

**Motion Detector Using Webcam**

**SUBMITTED BY:**

Section – k18gx G2

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**Project**: **Motion Detector Using Webcam**

### Abstract

This report is proposes a method for detecting the motion of a particular object being observed. The Motion tracking Surveillance has gained a lot of interests over past few years. The Motion tracking surveillance system is brought into effect providing relief to the Normal video surveillance system which offers time-consuming reviewing process. Through the study and Evaluation of products and methods, we propose a Motion Tracking Surveillance system consisting of its method for motion detection and its own Graphic User Interface. Various methods are used in Motion detection of a particular interest. Each algorithm is found efficient in one way. But there exits some limitation in each of them. In our proposed system those disadvantages are omitted and combining the usage of best method we are creating a new motion detection algorithm for our proposed Motion Tracking Surveillance system. The proposed system in this paper does not have its effect usage in office alone. It also offers more convenient, effective and efficient usage in home.

**Overview**

**Introduction :**

This paper proposes a method for detecting the motion of a particular object being observed. The Motion tracking Surveillance has gained a lot of interests over past few years. The Motion tracking surveillance system is brought into effect providing relief to the Normal video surveillance system which offers time-consuming reviewing process. Through the study and Evaluation of products and methods, we propose a Motion Tracking Surveillance system consisting of its method for motion detection and its own Graphic User Interface. Various methods are used in Motion detection of a particular interest. Each algorithm is found efficient in one way. But there exits some limitation in each of them. In our proposed system those disadvantages are omitted and combining the usage of best method we are creating a new motion detection algorithm for our proposed Motion Tracking Surveillance system. The proposed system in this paper does not have its effect usage in office alone. It also offers more convenient, effective and efficient usage in home available in market. We considered about the terms of format and their features which are based on features that are required of a Surveillance system and the additional features that are required for purpose of motion detection. The four products, namely ‘Active Webcam’ by py software, ‘Watcher’ by Digi-Watcher, ‘FG Engineering Surveillance 4 cam Basic’ by FG Engineering , and ‘Supervision Cam’ by Peter Kirst are chosen by considering users feedback. Also in the literature review, the existing methods for motion detection are discussed. They include some of popular methods, such as Temporal Difference and background modelling : as well as methods that are not so widely used due to certain constraints eg. Optical flow and Spatio-Temporal entropy.

1. **Motion Detection :**

Methods for motion detection can be categorized into 2 Main classes, i.e Regionbased and pixel-based algorithm [8]. The former, based on Spatial dependencies of neighboring pixel colours to provide results more robust to false alarms. The later based on binary difference by employing local or pixel-based model of intensity, is a simple model often used in real-time application.

1. . **CONCEPTS :**

The motion detection algorithm is based on background change detection, i.e. the difference method by background subtraction. This assumes that the background modelfor the expected image sequence is known in advance and that it does not change over time. Such conditions are rarely given for an indoor scene, e.g. when illumination changes occur and objects are moved around. Hence a confident adaption method is required. An adaption region must be specified that discerns between foreground and background objects. By definition the background change detection itself yields that distinction but is inappropriate because undetected foreground objects will be falsely adapted to the modelled background image. Therefore the discrimination must be done by a different method. The temporal change detection discerns between moving and stationary objects by comparing consecutive images. But stationary foreground objects are not detected as such and to obtain a similar behaviour as the background change 7 detection a temporal change history must be accumulated. Hence background change detection classifies the scene into foreground and background objects and temporalchange detection classifies into moving and stationary objects. The temporalchange history reflects regions in the image sequence that did not change for a certain time and is used as criterion for the distinction between foreground and background objects. Therefore the temporal change region corresponds to the adaption region

1. ***Background AND Foreground Separation:***

The Discrimination between Background and foreground Is Based On Block-Based motion Estimation. In This Paper, The Modified Block-Based Estimator Is Used To Track Changes Of The Individual Block. Each Frame of The 320x240 Pixel Resolution Is Divided Into Non-Overlapping Of 32x24 Pixels. For The Block Motion Estimation, A 9x9 Window Region With The Maximum Standard Deviation Is Extracted Within Each Block

5. ***RATIONALE***

The detection of motion essentially requires the user to

perform two major steps. They are: foremost step is to setup

the hardware for acquiring the video data in which the motion

is to be detected and the later step is to actually device an

algorithm by which the motion will be detected. The AVI

video format is actually an interleave of Audio and Video.

The video stream is stored or acquired as a series of frames

occurring in an ordered sequence one after the other [5].

2) ***ACQUISITION SETUP***

The Matlab programming language is used to store data in

the form of matrices. Therefore Matlab can provide quick

interface with data matrices. The software provides for frame

acquisition from hardware devices such as web cams or digital

cameras as long as the devices are correctly initialized by the

programmer. Therefore, in order to allow quick setup with the

image acquisition devices, Matlab Function directory provides

a host of predefined functions by which the user can inquire

about the various different devices currently connected and

then setup the required device with Matlab so that it can

acquire and store data at run time.

VI. ***MOTION***

***DETECTION ALGORITHM***

The Matlab interface allows the user to define the

commands to be performed at the run time. Once the user

setup of the video source is complete the algorithm comes into

play. The algorithm is built to take advantage of the strength

of Matlab i.e. to store data as a form of matrices. The frames

acquired are stored in the Matlab directory as matrix in which

each element of the matrix contains information about the

pixel value of the image at a particular location. Therefore,

the pixel values are stored in the workspace as a grid where

every element of the matrix corresponds to an individual pixel

value [6].

Since Matlab considers each matrix as one large collection

of values instead of a bunch of individual values it is

significantly quicker in analyzing and processing the image

data. The algorithm hence checks each frame being acquired

by the device with the previously acquired frame and checks

for the difference between the total values of each frame. A

threshold level is set by the user with which the difference of

values is compared. If the difference exceeds the threshold

value the motion is said to be detected in the video stream.

The various codes used in this work are shown below.

Motion detection can be used in :

There are many existing devices in market such as

1.CCTv Cameras,

2.IP camera,

3.Infrared Sensor,

4. Laser Sensor etc.

CCTv : Implementation of CCTv cameras are very costly and has drawbacks since it require constant monitoring of every activity which is not as ease. Continuous manual visualization hampers the productivity and time. Criminals can penetrate into the CCTV system, thereby facilitating criminal acts.

IP camera : Implementation of IP cameras are also very costly and not feasible. This system cause major problems as it becomes open to hackers via internet(false bomb threats, called in hoaxers while watching the cameras.

Infrared Sensor and Laser Sensor: These devices are quite economic in comparison to above devices however they have some drawbacks too. These devices are difficult to install and rarely available. One of the major disadvantages of infrared sensors is the size required to provide good resolution to the the signal.

Conclusion :

In the end we all know its going be of great use its going to help us in many ways including security purpose .

The “smartweb cam motion detection surveillance system” is a Home/Office based security system which can be of great where security is a matter of concern. The Motion Detector patches up for the need of a cheap and small security system in day-to-day life. Computerized Home-based security can develop a lot with the coming future. Future is promising and easier with innovative technologies.

After trying human motion (slow and fast) with different error threshold values for the same motion; the results show

that the appropriate value is between 1.3 and 1.5 especially if several motions (medium changes) occur in the scene; this will

give less number of saved images that contain false or wrong detections. If the case and the threshold are not standard; we

can specify a threshold according to our location that we want to monitor.