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Motion Detection Application Using Web Camera

Nikhil Singh[1], Praveen Kumar[2], Priya Akhoury[3],
Rohit Kumar[4], M. Ramasubramanian[5]

Department of Computer Science and Engineering, Aarupadai Veedu Institute of Technology, Rajiv Gandhi Salai, (OMR), Paiyanoor-603104, Kancheepuram District, Tamilnadu, India
Vinayaka Missions University

Abstract: *The topic of the project is "Motion Detection Application Using Web Camera". From the topic, everyone may know that the target of the project is using "web camera" to achieve the target of the "motion detection". In the application, there are many web camera attached to the computer. These web cams are used as an eye to find motion. Whenever a movement occurs in front of the web cam that frame is stored in specific location. The project also focuses on reducing the storage capacity needed for these types of applications.*

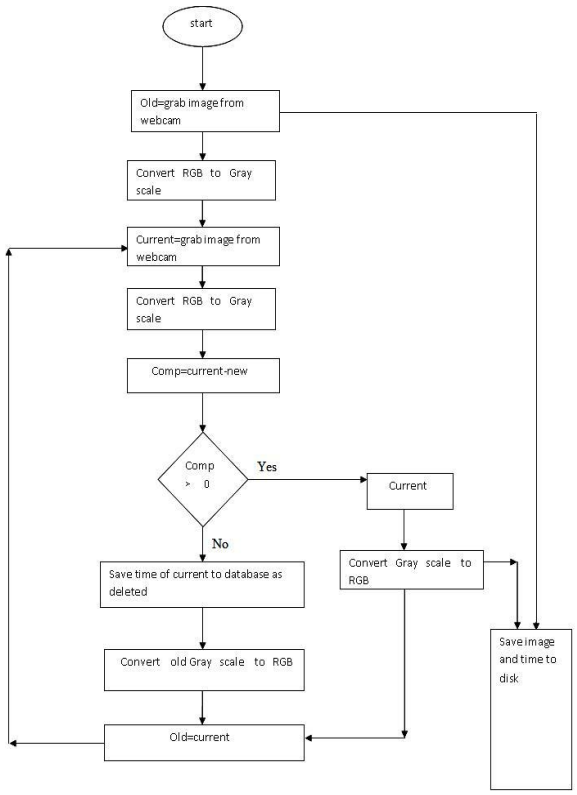
Keywords: *Web-based Surveillance System*

I. INTRODUCTION

Security is one of the most important problems all over the world. This project basically concern on the use of automatic motion detection application using webcams for security purpose. Today in our society security is one of the major issues and having a 24*7 human eye is just impossible. Our project Motion Detection Application Using Web Camera is just a one of the applications which help us to achieve this goal. In order to be secured of safety, it is useful to realize and manage smart surveillance system combined with image processing techniques.

These functions are necessary for autonomic monitoring, which is provided by our surveillance system. This paper presents related works and problems of our previous surveillance system, at first. An overview of the new version of our surveillance system and its functions are described in the next section. For comparison process there are many approaches but here frames are converted from RGB format to GRAY scale format and then compared. Again the frames are converted back to RBG format before storing. The gray scale conversion is done to decrease the pixel values. Whereas the frames are compared pixel by pixel. The difference in the frame gives only the moving objects on the frame.

The main objective of the proposed approach is to reduce the storage size by storing only the frame having motion instead of the whole video.



Configuring the Web Cam & Capturing the Videos

In the web cam selection the user first of all initialize the camera then specify frame size. The frame size and frequency will be changeable because of frame saved in the specified location. In this location image stored as frame. It will then start to capture the video, it will set the first image as a background, the next image will be taken with the same frame

size 'x'&'y' i.e. width & height. Now we have to calculate the image mean position and mean velocity. For any given frame of video, we can subtract the background image from it to check the motion (the detection for motion is purely pixel to pixel detection). Those pixels with a result near zero are treated as background and those pixels with a larger result are treated as foreground. Thus, once we have the model of the background image, this is simple, efficient, and easy to implement.

II. SYSTEM CONFIGURATION

At first, by means of image processing for monitored data, it is illustrated whether remarkable changes between continuous sampled images happen or not. Secondly, through comparison of a series of monitored image from network camera, detection of dynamic changes from the previous image to no one is performed so that the signal for homing of camera's platform can be computed and sent to camera for controlling its platform. It is used to read data from an output Data Source of a Processor. It creates a processor and hook up the output. Instantiate and set the frame access codec to the data flow path. Get the output Data Source from the processor and hook it up to the Data Source Handler. It reads from camera and display information of each frame of data received. It uses the Java Media Framework to detect image capturing device. It locates the Locator = vfw://0 to detect capture device using plugins.

2. OVERALL ARCHITECTURE DIAGRAM

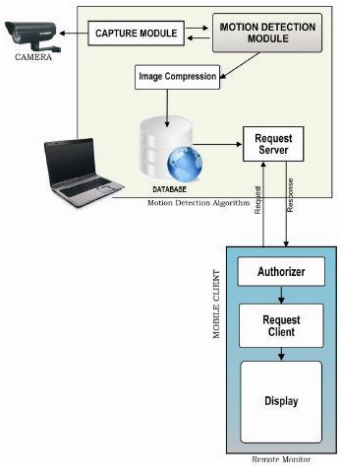


Fig.1. Overall architecture

III. MOTION DETECTION MODULE

Image processing has been done with the following procedures; two target images extracted from database are divided into fourth or ninth pieces of sub image, corresponding two pieces of sub image are compared with pixel-wise operations, and detection of dynamic changes can be performed based on the result whether compared two sub images are different or not.

2. CAPTURING VIDEO:

The capture video images must be specified the position x, y, width, height. This position calculates the images (frames). Position (x, y) indicating the mean position of the feature on the human body, as well as a mean velocity (vx, vy).

3. DETECTION OF MOTIONS

In detection of motion process, first of all the background image (initial frame) must be converted into gray scale and then the current image is converted into the gray scale image since in a gray scale conversion the range of the color is from 0-256 only. Reducing the number of point features in each model evaluation requires us to be more intelligent about choosing them in the first place. It would be impractical to simply find the point motion throughout the entire image, and feed all resulting features to the model in a single evaluation. First of all, the number of features would be very large, giving poor performance.

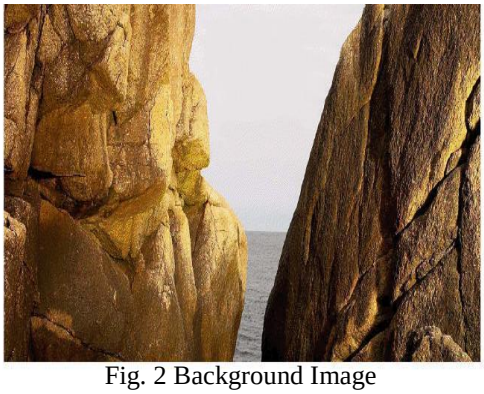


Fig. 2 Background Image

Secondly, we would be supplying a large number of extraneous point features, such as those that are part of the background. In order to avoid wasting time on the background, we use image segmentation to separate foreground portions of the scene from the background by subtracting the converted current image to initial image.

Methods for motion detection can be categorized into two main classes, i.e. pixel-based and region-based algorithms.

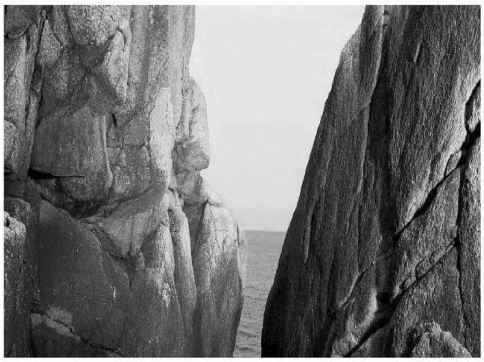


Fig. 3 Grayscale Conversion

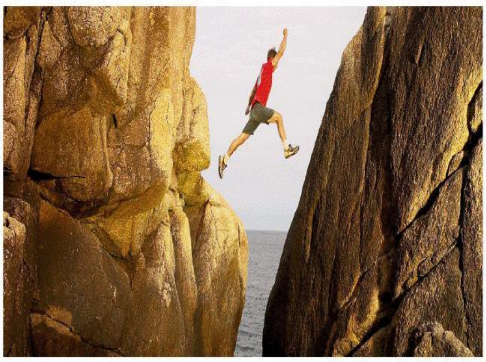


Fig. 4 Current Frame

TEMPORAL DIFFERENCE

The comparing of consecutive frames on a pixel by pixel basis in a motion sequence is calculated and threshold is applied which classifies them as either stationary or in motion. However, as objects moves, their homogeneous interiors do not result in changing image intensities over short time periods, so motion can only be detected at the boundaries. Also, it does not show relationship of pixel with its neighborhood.

BACKGROUND MODELING

Background modeling methods can be classified as pixel-based and region-based models. For pixel-based background modeling, background subtraction is often used. An image of the stationary background is generated by averaging the image sequences over a period of time on a mixture of Gaussian distributions. Each incident pixel color is computed by comparing it with every Gaussian density. If two pixels do not match, they will be labeled as the foreground pixels and be detected as motions.

We are using the co-occurrence algorithm for the comparison of frames. In this co-occurrence algorithm, each point pixel is compared i.e. (location based ratio of the pixels).

Synchronization with the Database

This Module is basically needed to check the continuous working of the application or we can say that to check the continuous working of webcams. Basically in this module a log file is created which keeps record of all the image compared and deleted with its time of deletion. Let's take a scenario in which a camera in a super market stops working at 11:00 pm just half an hour after closing of the market and starts working at 9:00 am next morning before opening of the market. So it will be practically impossible to know that webcam was working all the time as no two same images are saved. So in this section all the images taken compared and deleted will have a entry in a log fill with reference to its time.

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