

## Heister/Swinder Detection in Live Stream Video Using Blob Analysis

S.Kanimozhi<sup>#1</sup>, R.Gopinath<sup>#2</sup>, S.Mohamed Shariff<sup>#3</sup>, K.Naveen Infant George<sup>#4</sup>

<sup>#</sup>Assistant Professor, P.R.Engineering College, Thanjavur, India

<sup>1</sup>kani03mozhi@gmail.com

<sup>#</sup>Final year, C.S.E, P.R.Engineering College, Thanjavur, India

<sup>2</sup>gopi41611@gmail.com

<sup>#</sup>Final year, C.S.E, P.R.Engineering College, Thanjavur, India

<sup>3</sup>smspvr@gmail.com

<sup>#</sup>Final year, C.S.E, P.R.Engineering College, Thanjavur, India

<sup>4</sup>naveeninfant2208@gmail.com

**Abstract—** This paper is to find the new method of security camera surveillance for find the thief .It mainly designed for bank lockers and very secret places. In the existing system that works on manual control but in our system we do it as automatically. We detect the motion by using Blob analysis and find the different between human and other object by using Fourier analysis and use the analysis for eliminate small object moving .We use the GSM modem for send the SMS for the client whole process is control by the computer system.

**Index Terms** \_\_\_ Motion detection, Blob analysis, Fourier analysis, Modem.

### I. INTRODUCTION

Due to the unsafety life now a days we are implement large number of security systems. And security members moving object detection is a fundamental task required for many image and video processing applications like video surveillance, medical imaging, satellite imaging, biometrics identification, automated inspection in industry products etc. Basically this involves segmentation of moving object in the scene.

Segmentation subdivides an image into its constituent regions or objects. The level to which the segmentation is carried depends on the problem being solved. Segmentation uses

different techniques like morphing, point, line and edge detection problems with illumination like shadows on the background, difference in the intensities of the objects in the image may arise in segmentation.

In this project, we will use Matlab environment to implement this algorithm. Matlab stands for Matrix Laboratory. It is complemented by a family of application specific solutions called toolboxes. The image processing tool box is a collection of Matlab functions that extend the capability of Matlab environment for rapid prototyping, implementation and testing of the image processing algorithms

We aim to implement a robust moving object detection algorithm that can detect object in variety of challenging real world scenarios. We organize the video into frames in which the background is stationary. We use image processing tool box for obtaining the object by subtracting the frames. The moment of the object is described using edge detection techniques. We will collect experiment datasets for these scenarios for testing our algorithm

Digital Image Processing refers to processing of digital images by means of a digital computer. Digital image can be defined as two dimensional function  $f(x, y)$  and the amplitude of at any point gives the gray level or intensity of the image.

*A. Image Processing is done in three levels:*

Low level processing involves primitive operations like noise reduction, image sharpening etc.,

Midlevel processing involves partitioning an image into regions or objects. Higher level processing involves “making sense” of an ensemble of recognized objects.

Moving object detection comes under mid- level processing. Matlab is a high performance language for technical computation whose basic data element is an array that does not require dimensioning. Matlab stands for *matrix laboratory* which is a standard computational tool for advanced courses in mathematics, engineering and sciences. Matlab is a choice for research and analysis as it is complemented by a family of application specific solutions called tool boxes. Image processing tool box helps in digital image processing.

We aim to implement a robust moving object detection algorithm that can detect objects in variety of challenging real world scenarios. Matlab is a choice for research and analysis as it is complemented by a family of application specific solutions called tool boxes. Image processing tool box helps in digital image processing.

## II: SYSTEM DESIGN

### SYSTEM ARCHITECTURE



Fig: 1 System Architecture.

### A. WORKING PROCESS

The code was run in the system and activate the camera. If there is no detection then the system displays no motion .if any object is move then the camera is catch the image of the moving object and display. And make the sound

alert and then make a SMS alert .and send the catcher image to mail.

### B. OPERATIONS PERFORMED

- imread(): This operation reads an image given as input and stores it in the form of a matrix. The pixels of the image can be read by using array editor.
- rgb2gray (): This function converts color image into a gray scale image. This operation is done because Matlab functions are performed only on gray images.
- imsubtract(): This function is used to subtract one image from the other. Both the images should be of same type. Here we use it to isolate the object from the image.
- im2bw(): It is used to convert an image into binary format. It helps in removing the noise around the object. The threshold value of the object can be manipulated to clear the noise to a little large extent.
- imdilate(): Dilation helps in thickening the object, it combines the disconnected components of the image.
- imerode(): Erosion helps in thinning the object, it helps in removing the noise on the edges of the object
- imclose(): It is used to close the open parts of an object to form a single component.
- imfill(): It is used to fill the small holes in the object which have a closed outline.
- bwlabel(): It labels the different components present in the image. This helps us to know the number of objects present.
- graythresh(img): Returns the threshold of the input image.
- bwareaopen(): Helps in removing the small amount of noise in the background according to the given pixel intensity.

### III .Motion detection analysis.

#### A.Blob analysis.

Use the Blob Analysis block to calculate statistics for labeled regions in a binary image. The block returns quantities such as the centroid, bounding box, label matrix, and blob count. The Blob Analysis block supports input and output variable size signals.

You can also use the block from Simulink®, to select certain blobs based on their statistics.

For information on pixel and spatial coordinate system definitions, see **Image Coordinate Systems** (Image Processing Toolbox) and **Coordinate Systems**.

#### B.Area

Select this check box to output a vector that represents the number of pixels in labeled regions

#### Centroid

Select this check box to output an  $M$ -by-2 matrix of  $[x \ y]$  centroid coordinates. The rows represent the coordinates of the centroid of each region, where  $M$  represents the number of blobs.

*Example:* Suppose there are two blobs, where the row and column coordinates of their centroids are  $x_1, y_1$  and  $x_2, y_2$ , respectively. The block outputs:

$$[x1y1z1]$$

#### C.Bounding box

Select this check box to output an  $M$ -by-4 matrix of  $[x \ y \ \text{width} \ \text{height}]$  bounding boxes. The rows represent the coordinates of each bounding box, where  $M$  represents the number of blobs.

*Example:* Suppose there are two blobs, where  $x$  and  $y$  define the location of the upper-left corner of the bounding box, and  $w, h$  define the width and height of the bounding box.

#### Statistics output data type

Specify the data type of the outputs as double, single, or to Specify via Data Types tab. The fields on the **Data Types** tab appear when you set the output data type to Specify via Data Types tab.

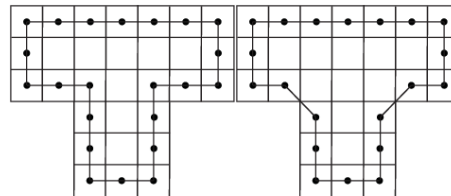


Fig 2 The matrix connect 'T' Shape

The above two Fig are detected by the system as a 'T'. By using blob analysis. It store the object to detect them and make all as the correct form.

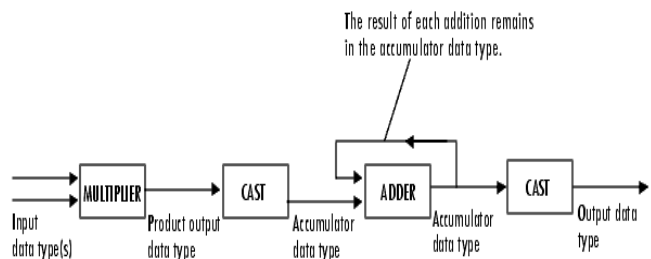


Fig 3 Working method of blob analysis.

The parameters on the Data Types tab apply only when you set the **Statistics output** data type parameter to Specify via Data Types tab.

#### D.Fourier Analysis

Signal analysts already have at their disposal an impressive arsenal of tools. Perhaps the most. Another way to think of Fourier analysis is as a mathematical technique for transforming our view of the signal from time-based to frequency-based.

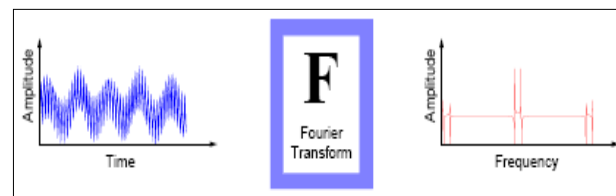


Fig 4 Fourier Transform Process

For many signals, Fourier analysis is extremely useful because the signal's frequency content is of great

importance. So why do we need other techniques, like wavelet analysis?

Fourier analysis has a serious drawback. In transforming to the frequency domain, time information is lost. When looking at a Fourier transform of a signal, it is impossible to tell when a particular event took place. If the signal properties do not change much over time that is, if it is what is called a stationary signal this drawback isn't very important. However, most interesting signals contain numerous non stationary or transitory characteristics: drift, trends, abrupt changes, and beginnings and ends of events. These characteristics are often the most important part of the signal, and Fourier analysis is not suited to detecting them.

*Short-Time Fourier analysis:*

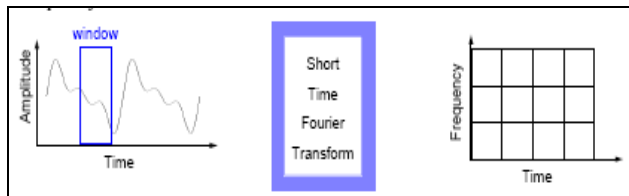


Fig 5 Short-Time Fourier analysis

The STFT represents a sort of compromise between the time- and frequency-based views of a signal. It provides some information about both when and at what frequencies a signal event occurs. However, you can only obtain this information with limited precision, and that precision is determined by the size of the window. While the STFT compromise between time and frequency information can be useful, the drawback is that once you choose a particular size for the time window, that window is the same for all frequencies. Many signals require a more flexible approach—one where we can vary the window size to determine more accurately either time or frequency

### E. Wavelet Analysis

Wavelet analysis represents the next logical step: a windowing technique with variable-sized regions. Wavelet analysis allows the use of long time intervals where we want more precise low-frequency information, and shorter regions where we want high-frequency information. you can see intuitively that signals with sharp changes might be better analyzed with an irregular wavelet than with a smooth sinusoid, just as some foods are better handled with a fork than a spoon

Wavelet analysis allows the use of long time intervals where we want more precise low-frequency information. and Very important. However, most interesting.

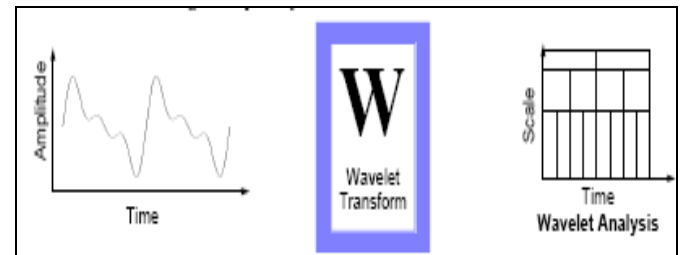


Fig:6 Wave Analysis

Here's what this looks like in contrast with the time-based, frequency-based, and STFT views of a signal:

Fourier analysis consists of breaking up a signal of the original (or mother) wavelet. Just looking at pictures of wavelets and sine waves, you can see intuitively that signals with sharp changes might be better analyzed with an irregular wavelet than with a smooth sinusoid, just as some foods are better handled with a fork than a spoon. It also makes sense that local features can be described better with wavelets that have local extent.

### IV. MODULES

There are five modules they are,

1. Heister detection
2. Take picture
3. Send email
4. Alert sound
5. Alert in phone

#### A. HEISTER DETECTION

To reduce the memory wastage we follow this technique. Using blob analysis we detect the movement. And start recording.

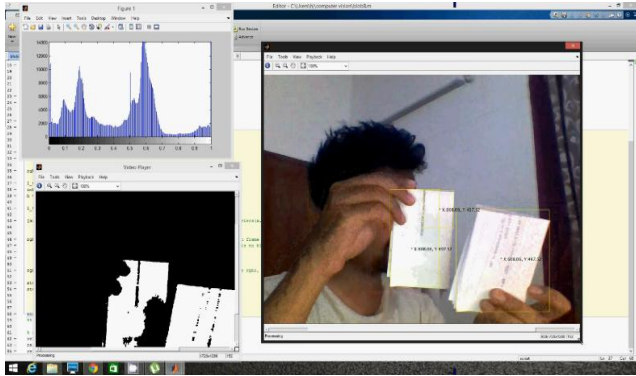


Fig 7 Motion detection

### B. TAKE PICTURE

Taking the picture. And store the picture on own data base. Convert the picture from RGB to GRAY for separate the background. It is make the process easy.

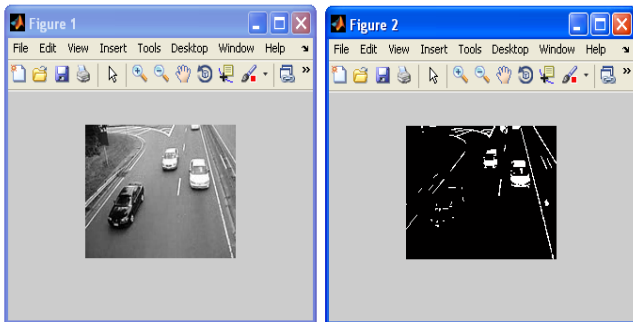


Fig 8 Picture catching

### C. SEND MAIL

After storing the taken picture the picture will send to the client through email id. The email should be predefined in the system. We can send the mail alert for N- number of mail id. Continuously the capture images will send to mail.

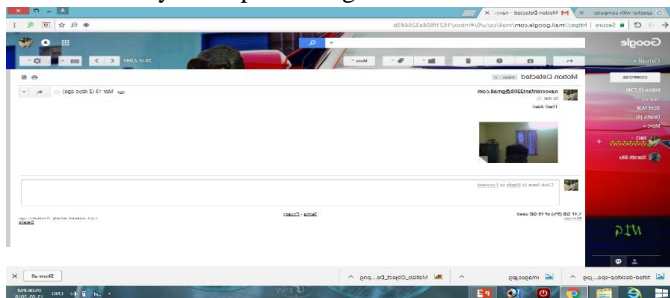


Fig 9 Send mail alert.

### D. ALERT SOUND

After send the picture to the user the alerting sound will ring. It was help to alert the near security. We doesn't use the IR/PIR for sense so there is no need of other power supply. We can describe what the alert sound should ring. And then the security will be alerted and can catch the thief easily



Fig 10 Sound alert

### E. ALERT IN PHONE

If the user is on off line or not read the email then this technique will help. After the sound alert the system will make the alert in phone through GSM modem. We can send the SMS to N-number of user.

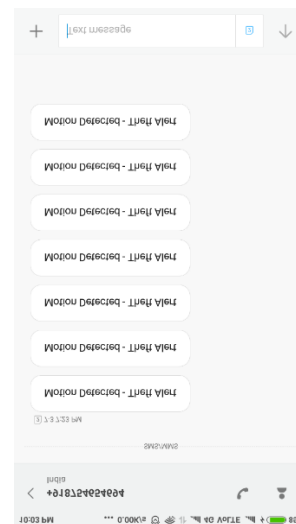


Fig 11 Phone Alert

## *The MATLAB Application Program Interface (API):*

This is a library that allows you to write C and Fortran for calling routines from MATLAB (dynamic linking), calling MATLAB as a computational engine, and for reading and writing MAT-files.

### ***F.Input control devices***

Special software can use the video stream from a webcam to assist or enhance a user's control of applications and games. Video features, including faces, shapes, models and colors can be observed and tracked to produce a corresponding form of control. For example, the position of a single light source can be tracked and used to emulate a mouse pointer, a head-mounted light would enable hands-free computing and would greatly improve computer accessibility. This can be applied to games, providing additional control, and improved interactivity.

### *V ADVANTAGES*

- High performance system.
- Automated video surveillance system for real-time security system.
- If motion is found in this video, the computer will start recording, buzz an alarm and send SMS to people listed in its database.
- Online monitoring.
- Alert in phone

### *VI. CONCLUSION*

In this project a concept and the development of the motion detection camera is implemented with the sensing, image catcher and alert with sound. Stability, gait generation, navigation and the object detection are all the key factors in the motion design. Therefore development of the humanoid welcoming robot mainly developed to reduce the manual work. This type of implementation which is to be used in the functions considered to be a main attraction by the humans.

### *FUTURE ENHANCEMENT*

The Future Surveillance Security System Can Introduce The 4k Video Support For Clear Picture. Then the future surveillance system can implement with automatic door locking system. And also it can be automatically spread the chemical (chloroform) to make heister as unconscious. Make a alert to the police station. In future this process can control via mobile phone. The laser light is activated to attack the thief.

### *VII. REFERENCES*

1. Hsieh, J.W., Yu, S.H., Chen, Y.S.: Morphology-based license plate detection from complex scenes. In: IEEE International Conference on Pattern Recognition. (2002)
2. Arth, C., Limberger, F., Bischof, H.: Real-time license plate recognition on an embedded dsp-platform. In: CVPR. (2007)
3. Yuan, Y., Zou, W., Zhao, Y., Wang, X., Hu, X., Komodakis, N.: A robust and efficient approach to license plate detection. In: IEEE Transactions on Image Processing. Volume 26. (2017)
4. Du, S., Ibrahim, M., Shehata, M., Member, S., Badawy, W.: Automatic license plate recognition (alpr): A state-of-the-art review. In: IEEE Transactions on Circuits and Systems for Video Technology. Volume 23. (2013)
5. Li, H., Shen, C.: Reading car license plates using deep convolutional neural networks and lstms. In: arXiv:1601.05610. (2016)
6. Chang, S.L., Chen, L.S., Chung, Y.C., Chen, S.W.: Automatic license plate recognition. In: IEEE Transactions on Intelligent Transportation System. Volume 5. (2004)
7. Anagnostopoulos, C.N.E., Anagnostopoulos, I.E., Psoroulas, I.D., Loumos, V., Kayafas, E.: License plate recognition from still images and video sequences: A survey. In: IEEE Transactions on Intelligent Transportation System. Volume 9. (2008)
8. Gou, C., Wang, K., Yao, Y., Li, Z.: Vehicle license plate recognition based on extremal regions and restricted boltzmann machines. In: IEEE Transactions on Intelligent Transportation System. Volume 17. (2016)
9. Cheang, T.K., Chong, Y.S., Tay, Y.H.: Segmentation-free vehicle license plate recognition using convnet-rnn. (2017)
10. Hsu, G.S., Chen, J.C., Chung, Y.Z.: Application-oriented license plate recognition. **62** (2013).