# Anomaly Detection In Robbery Using A Video Surveillance Survey

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***ABSTRACT****: Abnormal event detection is one of the important objectives in research and practical applications of video surveillance. Surveillance cameras are increasingly being used in public places e.g. streets, intersections, banks, shopping malls etc to increase public safety. One critical task in video surveillance is detecting anomalous events such as traffic accidents, crimes or illegal activities. Generally, anomalous events rarely occur as compared to normal activities.The goal of a practical anomaly detection system is to timely signal an activity that deviates normal patterns and identifies the time window of the occurring anomaly. Therefore, anomaly detection can be considered as coarse level video understanding, which filters out anomalies from normal patterns. Once an anomaly is detected, it can further be categorized into one of the specific activities using classification techniques. This paper presents an overview of anomaly detection, focusing on the context of banking operations applications. Banking operations include many daily, periodic, and a periodic activities and transactions performed by or affecting numerous stakeholders such as employees, customers, debtors, and external entities. Events may unfold over time, and early detection can significantly ameliorate potential ill-effects, and in some cases actively prevent the same. Time series based anomaly detection used to detect persons in unwanted time. In this work machine learning based anomaly detection technique implement to detect the normal and abnormal events.*

***Keywords—detection,technique,criminal,SMS alert,authority.***

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## I. INTRODUCTION

Abnormal event detection in video surveillance with the increasing awareness of the public security. A typical method to detect anomaly event is to detect patterns in video scenes.Many efforts have been done to automatically detect and locate the abnormal events to avoid laborious and time consuming work of manually recognizing them.We purpose of new abnormal event detection System with Gaussian mixture model algorithm is used .due to the unique principle of operation and unconventional output new algorithms are developed in this work to exploit their capabilities in abnormal event detection.the major contributions of our work can be summarized in the following Aspectsof abnormal event detection.Anomalous event detection is an important component of intelligent video surveillance. The anomalies detection: Abnormal motion with sudden actions compared to most of the other motion in the video.Face recognition can be attributed to the increase of commercial interest of person identification process.

## II. LITERATURE SURVEY

### A.*Unsuprived Deep Learninig Model for Early Network Traffic Video;*

The engRen-hung Hwang, Min-chun P,has proposed the paper An Unsupervised Deep Learning Model for Early Network Anomaly Detection for the purpose of Convolutional Neural Network (CNN) and the advantages Detect the events in traffic videos and disadvantages Only support limited datasets.

### *B.learning Memory Guided Normality for Anomaly Detection;*

The Hyunjong Park, Jongyoun Noh has proposed the paper Learning Memory-guided Normality for Anomaly Detection for the purpose of U-Net architecture and theComputational cost is high advantages Abnormal event detection and disadvantages *Computational* cost is high.

### *C.A Deep One Class Newtral Network for A Nomalous Event Detection in Complex Scenes;*

ThePeng Wu , Jing Liu , and Fang Shen has proposed the paper Deep One-Class Neural Network for AnomalousEvent Detection in Complex Scenes for the purpose of Deep one-class (DeepOC)Classifier and neural networks and the advantages Detect the scenes from video datasets and disadvantages Time complexity is high.

### *D.Integrating Prediction and Reconstruction for Anomaly Detection;*

The Yao Tanga, Lin Zhaoa has proposed the paperIntegrating Prediction and Reconstruction for Anomaly

Detection for the purpose of Integrating prediction scheme And the advantages Find difference values from imagedatasets and disadvantages Does not support realtimeenvironments.

**E.Social Network Model for Crowed Anomaly Detection and localization;**

The Riema Chaker has proposed the paper Social Network Model for Crowd Anomaly Detection and Localization for the purpose of Proposed Social Network Model (SNM) approach on a set of benchmark crowd analysis video sequences and the advantageLocate the abnormal events from images and disadvantages Need to implement large image datasets.

## III.EXISTING SYSTEM

Extrapolation of anomalous data from format-compliant encrypted bitstreams for the detection of abnormal activity. The data size of the macroblock (in bits), the macroblock (MB) partition mode, and the amount of motion vector difference are all estimated quantities acquired from the bitstream structure and codeword structure in this technique (MVD). For compression, most video encoding frameworks use prediction and compensation. The majority of the background and normal contents are accurately predicted, resulting in modest MBs (a few bits). Anomaly motion requires more bits in the video bitstream than normal motion because it is "unexpected" and usually signifies rapid motion. The anomaly regions are brighter than the typical regions, indicating that the anomaly consumes more bits in the bitstream. All of the sudden spikes in MB size are due to an abnormality, especially when multiple objects are moving normally in a single frame. In various anomaly detection techniques, MV is a feature that is widely used. Traditional MV feature extraction algorithms are not applicable for our scheme since MVs are encrypted in the encrypted video. We offer a new parameter-estimated MV feature extraction approach. The MV is made up of two pieces in the video bitstream: the expected MV and the MVD. The difference between the current MV and the expected MV is the MVD. The MVD's size represents the amount of motion information it contains. The expected MV in the encrypted bitstream is jumbled in our application case. Although the MVD is encrypted as well, the codeword length is kept constant to ensure that the encrypted bitstream format is compatible with the video decoder.

**Disadvantages;**

- Only implement image to image matching.
- Performance is less at the time of abnormal detection in encrypted video frames.
- Fail to simultaneously utilize the rich information and relationship between still images.
- Need additional hardware system to detect abnormal event.

## IV.PROPOSED SYSTEM

The proposed system focuses on establishing a Smart Camera that watches bank activities, can detect any type of suspicious conduct, and thieves may be followed using motion and time-based face detection. If a suspicious face is seen at an inconvenient hour, the Smart Camera will send an alarm message to the security department automatically. The message specifies the type of warning that has been created, as well as image sharing when a face has been recognized, along with a web link to the live image, so that security can be prepared appropriately. The usual Gaussian mixture model employs the following strategy: We update the background model by the learning rate for each pixel in the new image if the pixel is well described by any of the K Gaussian distributions; otherwise, we replace the least probable distribution with a new distribution with the current value as its mean value, a high variance at first, and a low priority weight. The Gaussian mixture model is an on-line learning method that may update the background model in response to changes in the environment, such as lighting. A Gaussian Mixture Model is a weighted sum of Gaussian component densities that is a parametric probability density function. And also use the HAAR Cascade algorithm to detect faces and send alert to admin.

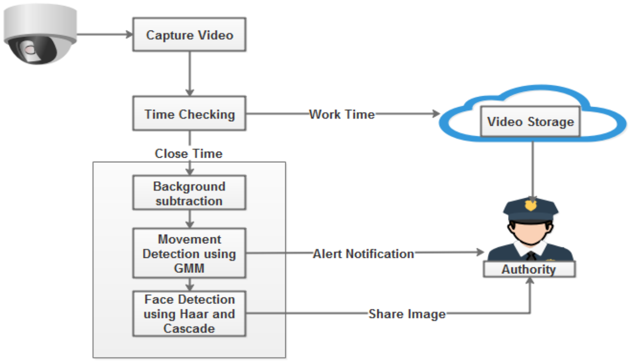


Fig1.Architecture of proposed system

**Advantages:**

- Build the relationship between the unbalanced distributions of still images and video clips of different quality
- Complexity is low and performance is high.
- Low time consuming for detection and provide alerts.

## V.MODULE

- Video Capturing Framework
- Set Time based Storage
- Movement Detection
- Face Identification
- Send Alert Intimation

### A.Video Capturing Framework

In this module propose a Surveillance Camera based theft detection along with tracking of thieves. Here use image processing to detect theft and motion of thieves in Surveillance Camera footage.This system concentrates on object detection.The security personnel can be notified about the suspicious individual committing burglary using Real-time analysis.

### B.Set Time based Storage

Admin should set the time for predicting abnormal activities based on unwanted time period. This module takes input from the Human Detection by surveillance camera. When the human enters into the system it checks the timer to measure the time. When the predefined time limit for human detection is reached, the system sends the alert mail to the admin. Motion Behavior of the human is analyzed in front of the system. The first step is by acquiring video images from CCTV. Those images will be used for motion detection process. If a motion is detected, the information of time stamp and images with detected motion will be stored. The captured time value should check with database to predict normal or abnormal activity.

### C.Face Identification

The first step is by acquiring video images from CCTV.Those images will be used for face detection process. We have utilize the human nature that human will have at least small amount of features based on face boundary movements. We can get this information easily because dealing with video sequence by which the whole sequence of the object's movements can be obtained.

### *D.*Send Alert Intimation.

The automatic detection of abnormal activities can be used to alert the related authority of potential criminal or dangerous behaviors, such as automatic reporting of a person. In proposed system unknown event alert send to the predefined contact numbers regarding particular officers. Here also implement image sharing for easy identification of criminals.

## VI.ALGORITHM

- Gaussian Mixture Model
- Haar Cascade Algorithm

### A.Gaussian Mixture Model

Anomaly detection is viewed as a statistical binary decision problem, where by observing x one must decide if it is a background pixel (  hypothesis) or a target pixel (  hypothesis). Further, it is assumed that background consists of N different clusters  (i = 1,2,..., N ) corresponding to different ground cover types. The generic cluster is modeled as Gaussian distributed and its p.d.f. is:

$$f_{c_i}(x) = f_G(x; \mu_i, \Gamma_i)$$

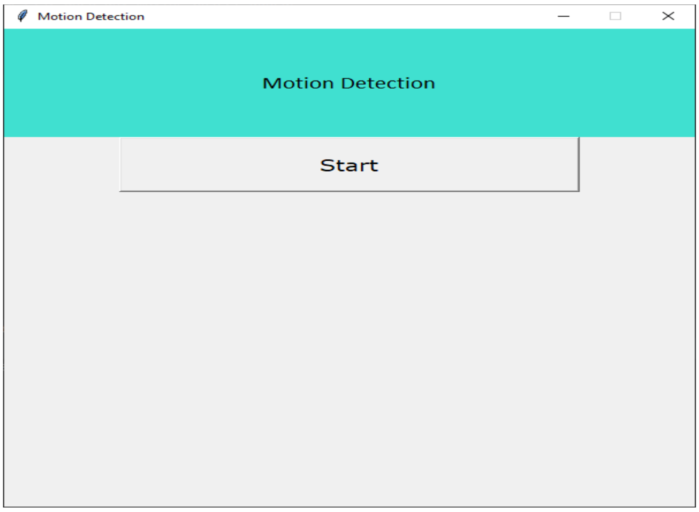
$f_G(x; \mu_i, \Gamma_i)$denotes the multivariate Gaussian p.d.f. with mean vector and covariance matrix

### B.Haar Cascade Athlgorim

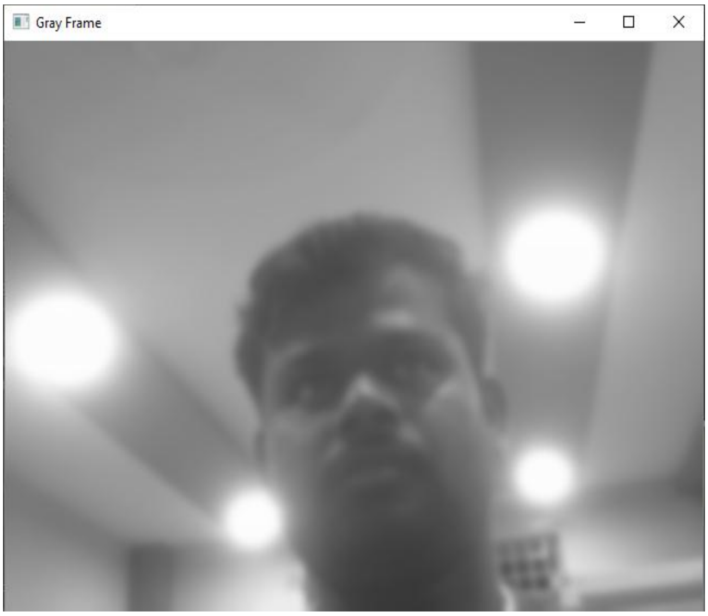
- Step 1: Read the face boundaries from video frames
- Step 2: Boundary values are constructed as feature vectors
- Step 3: Predict the tangent vector
- Step 4: Calculate distance values from query frames with still images
- Step 5: If distance value is equal to zero or less than the minimum means, match found
- Step 6: Otherwise send alert about unknown person

## VII.IMPLEMENTATION

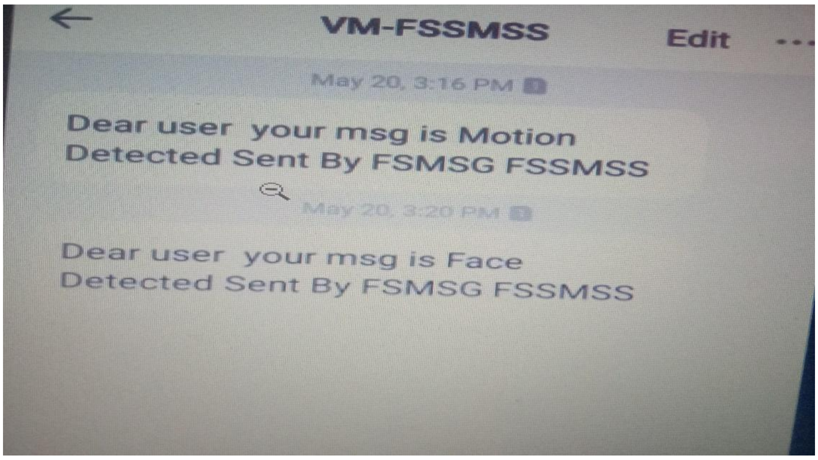
### A.Motion Detection



### B.Find Object



### C.Send message to authority



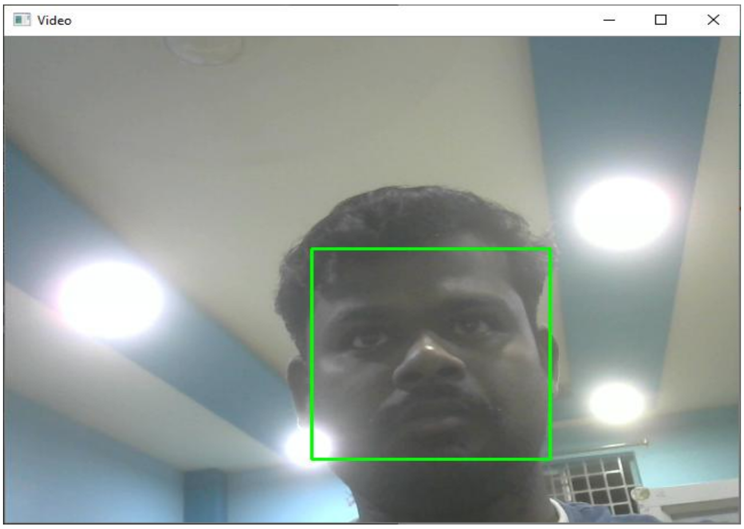
May 20, 3:16 PM

Dear user your msg is Motion Detected Sent By FSMSG FSSMSS

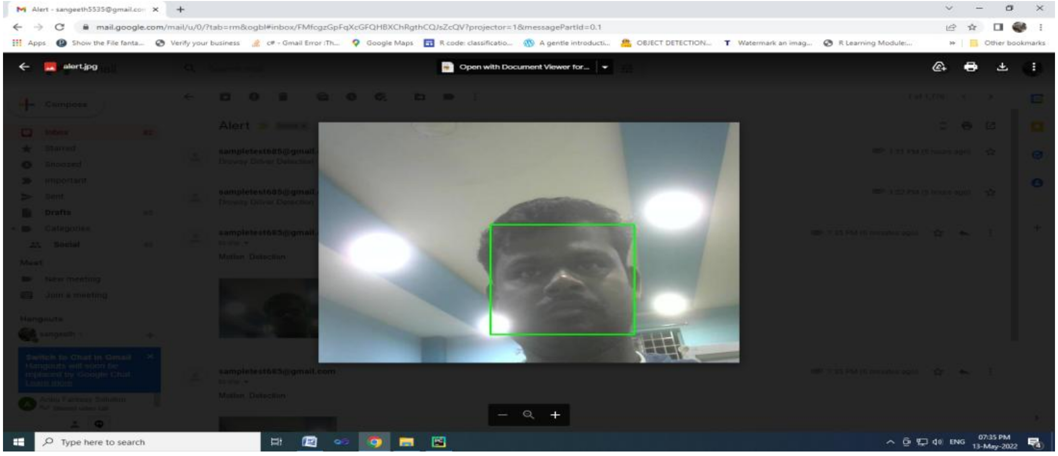
May 20, 3:20 PM

Dear user your msg is Face Detected Sent By FSMSG FSSMSS

### D.Face detect



### E.Send alert to through mail



## VIIICONCLUSION

Proposed system focuses on implementing a Smart Camera based anomaly detection which monitors the activityin the banks, it can detect any sort of suspicious behaviour, and the thieves would be tracked on the basis ofmotion and the face detection approach based on unwanted time period.If any such suspicious action is detected at unwanted time, the Smart Camera will automatically send an alert message to the security department.The message mentions what type of alert is generated; it also contains the face image of the thief and time detected with a web link where the live image is stored, so that the security can come with appropriate preparation.

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