

Design Of An Atm Security Through Smart Vision

P.Kavitha Head of the department/ ECE, S.Abinaya, P.Ammudevi, R.Kaviya
M.A.M.School Of Engineering, SiruganurTrichy

Email: kavithamamse@gmail.com, abi692102@gmail.com, ammutamilarasi2111@gmail.com, ramkaviya1999@gmail.com

Abstract— Automated teller machines (ATMs) are well known devices typically used by individuals to carry out a selection of person and business financial transactions and/or banking functions. ATMs became very fashionable with the general public for his or her availability and general user friendliness. ATMs are now found in many locations for instance, restaurants, supermarkets, malls, banking centers, airports and myriad of other locations. The paper research presents, if a person tries to interrupt the ATM it'll detected using vibration sensor and therefore the door are going to be locked immediately. On the thought of the feature extraction, the Support Vector Machine (SVM) classifies the activity of the captured images as normal or abnormal.

Keywords — ATM, Histogram of Oriented Gradient, Support Vector Machine.

I. INTRODUCTION

It is vital to automatically read the human activities from videos, because from the fast few years a wondered success of social networks and multimedia technologies, moving forward to the generation of vast amount of videos are getting uploaded, in order to provide value added service to the end user, number of research studies have focused on this particular challenging topic. Even though massive progresses in human action recognition have been achieved by recent studies, there are still two problems which need to be considered for its future enhancements. Cameras play a very vital role in now days life. One has got to check out the recorded images and videos whenever any incident happens.

The main objective for movement recognizes the events and aims of one or more people from the progression of observations on the people's action. Supervised learning and understanding of unusual human being deeds is more complex, difficult and wide task. Human deed Detection, scene modeling, motion tracking and behavior considerate. Surveillance is used to observe the behavior, changing information, or activities, usually of people for the cause of Influencing, organization, and directing or to defend them. It is used for various works such as, government for intelligence gathering, the prohibition of crime, the protection of a process, person, group or object, or for the Inspection of crime scenes.

Human behavioral pattern and face recognition plays very important part in person recognition. Visual information may be key source for such identifications. Surveillance videos provide such visual information which may be viewed as live videos, or it are often played back for future references. Now days 'automation' has its impact even in the field of video analytics. Video analyzing can be used for wide variety of applications like human activity prediction, person identification, motion detection, abnormality prediction, people counting at crowded places, vehicle counting etc. The actions of human may be overlapped by background changes or camera motion. Especially, camera motion may interfere with detecting the truth act. Secondly, it's still challenging to acknowledge human activities in realistic unconstrained videos due to an outside amount of

intra-class action variations.

There are two stages in this architecture, training and testing. In training stage we consider normal and abnormal images as input sample images, sample images which we are using as input sample are taken from the camera and later those images are pre processed from color images to gray scale images. To foreshorten human activity accurately and efficiently, the HOG features are employed for feature reduction. Result, feature reductions are trained to SVM classifier and will dump to knowledge base as a result database.

Modeling human behaviors and activity patterns for recognition or detection of special event has attracted significant research interest in recent years. Diverse methods that are abound for building intelligent vision systems aimed to words scene understanding and making correct semantic inference from the observed dynamics of moving targets. Most applications are in surveillance, video content retrieval, and human-computer interfaces. This paper presents not only an update extending previous related surveys, but also attention on contextual abnormal human behavior detection especially in video surveillance applications. The main purpose of this survey is to extensively identify existing methods and characterize the literature in a manner that brings key challenges to attention. Nowadays research is going on in the field of crime detection and avoidance within the ATM. But till now there's no advanced technology came within the field of ATM. So the idea of designing and implementation of security for ATM project are born from the observation of our real world incidents happening around us. Over the past three decades consumers have come to depend upon and trust the ATM to conveniently meet their banking needs. In recent years there has been a proliferation of ATM frauds across the world for ATM security in cooperation ATM software. The proposed method will uses multiple object detection method and event recognition techniques of computer vision.

II. LITERATURE SURVEY

- [1] Popoola, Oluwatoyin P., and Kejun Wang. "Video-based abnormal human behaviour recognition—a review." *IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews)* 42, no. 6 (2012): 865-878.
- Used this approach to recognize general activities by modelling the changes in velocity, position, size among other quantitative features. One the difficulty in tracing is minimizing the errors which occur when foreground segmentation is poor. Tracing through motion or foreground segmentation can be sensitive and degrade ungracefully when errors occur in adjacent frames within a capture sequence.

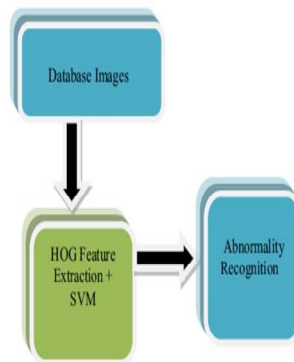
Paper 2

- [2] Gowsikhaa D, Manjunath, Abirami S."Suspicious Human Activity
- Detection. The idea of optical flow within action recognition assumes a fixed position camera such that the impression of motion can be concluded. While HOG simply requires the spatial gradient derivatives, optical flow estimates can be computed using a number of technique
- Paper 3
- [3] F.Bobick and James W.Davis,"The Recognition Of Human Movement Using Temporal Templates, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol.23, March2001.
- If someone enters in the ATM and by doing normal behavior leaves the ATM. Firstly, capture is separated into frames. Magnitude is calculated by root of sum squares of individual pixel concentration in grey level over frames.HOG is applied to extract information of the matrix
- Paper 4
- [4] C. Stauffer and W.E.L.Grimson, "Learning Patterns Of Activity Using Real-Time Tracking,"in *PAMI*,2000.
- Our goal is to develop a visual monitoring system that passively observes moving objects in a site and learns patterns of activity from those observations. For extended sites, the system will require multiple cameras. Thus, key elements of the system are motion tracking, camera coordination, activity classification, and event detection. In this paper, we focus on motion tracking and show how one can use observed motion to learn patterns of activity in a site. Motion segmentation is based on an adaptive background subtraction method that models each pixel as a mixture of Gaussians and uses an on-line approximation to update the model
- Paper 5
- P Bouthemy and F Meyer, "Region Based Tracking Using Affine Motion Models in Long Image Sequences,"
- Object tracking can be used in many applications using motion information. This paper proposes a method of region-based tracking using planar perspective motion models. Planar perspective models can represent

motion information of the plane rigid motion in the sequence properly. And in many cases the real object's motion can be represented using planar perspective motion models approximately. The method estimates model parameters on three pyramid levels, and it is based on the reliable estimation of planar perspective models in the region to be tracked. The calculation on three pyramid levels can accelerate the speed of estimation.

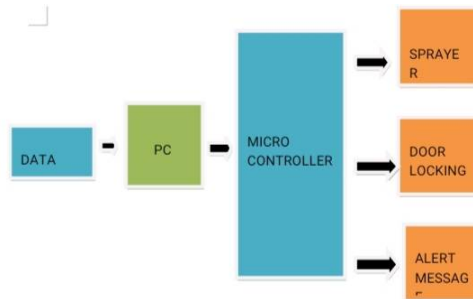
III. EXISTING SYSTEM

- One has to look at the recorded images and videos whenever any incident happens
- Camera action
- MEI and a MHI
- MEI is abinary illustration of the motion occurring between sequences of frames while the MHI is a grayscale intensity depiction
- Hidden Markov Model, Bayesian Model, Support Vector Machines, Neural Network, Fuzzy, HMM rule



IV. PROPOSED SYSTEM

Preparation of the database images.HOG feature extractions and SVM classifier. Abnormality recognition, if the abnormal activity is detected then an alarm is raised to security or either nearby police station. The software is used for the development of project is Matlab. Firstly, captured an image that is taken as input and trained our system and then to check its working accurately and efficiently or not, we have testing image to test the system. The (HOG) Histogram of Oriented Gradient is used to extract the features from the images. On the basis of result from the feature extraction the Support Vector Machine (SVM) classifies the activity of capture image is normal or abnormal.



V. HOG FEATURES

HOG is a characteristic descriptor. It is used to make the classification easier under divergent conditions and characteristic is to establish the thing in such a mode that the same object produces as close as possible to the same feature descriptor. The developers of this approach trained a SVM to identify the HOG descriptors of

natives Abnormal activity detection is very interesting field and it has got interesting future works, we have seen different kind algorithms like HOG, SURF, Harris corner detection, fast method, Graph cut method and many more which are implemented in different ways to overcome the possible problems occurring in detecting abnormality in ATM surveillance.

- **Input image**
 - it is a real time input obtained from camera the instant image captured by camera is given as input to the system Normal surveillance camera can be used.
- **Computer/Processor**
 - A processor is required to process the input image and runs the algorithm to detect the object. We use windows 10 laptop with MATLAB software to design and run the algorithm
- **Microcontroller**
 - Microcontrollers are the part of project which controls the external hardware components connected to it. We use Node McU wifi model controller to activate output devices and also to send alert msg
- **Chloroform Sparayer**
 - A Dc motor will be activated to spray chloroform once the object is detected and confirmed. This mechanism will spray the liquid and it can be controlled using the output value
- **Door lock mechanism**
 - Door locking mechanism can be activated using solenoid .The three step verification will be done before activating this mechanism

IOT MODULE The server will be alerted with a msg as the result obtained from algorithm

The IOT module connects the server with the digital devices and the external components. The server will get an alert message at once within a second when the object is detected



Advantages

- suitable and easily understandable Machine Learning Algorithms
- Will prevent the bad incidents effectively
- Fast response

Applications

- Theft detection
- Cryptography
- Crime detection

Works done

- 128 images are taken, 38 images of abnormal activity and 90 images of normal activity. Database images are taken as input image; they are used as training set images. Resize the training set images into 150x150. HOG feature extraction is used to extract the features from the training images.

VI. CONCLUSION

Extensive experimental results verify the efficiency of the proposed abnormal activity detection, by the mean of security bases, using HOG feature and SVM classifier. It is concluded that this method is more fast then other method (neural network). Elapsed time for neural network is approx. 28 seconds but for this method is approx. 12 seconds. At this time static images are used for the experimental work. But for future, video will be used instead of static images. We work on real time images (videos).

REFERENCES

- [1] Popoola, Oluwatoyin P., and Kejun Wang. "Video-based abnormal human behaviour recognition—a review." *IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews)* 42, no. 6 (2012): 865-878.
- [2] Gowsikhaa D, Manjunath, Abirami S."Suspicious Human Activity Detection.
- [3] AronF.Bobick and James W.Davis,"The Recognition Of Human Movement Using Temporal Templates, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol.23, March2001.
- [4] C. Stauffer and W.E.L.Grimson, "Learning Patterns Of Activity Using Real-Time Tracking,"in *PAMI*,2000.
- [5] P Bouthemy and F Meyer, "Region Based Tracking Using Affine Motion Models in Long Image Sequences,"
- [6] C. Harris and M.Stephens, "A Combined Corner and Edge Detector," in *AVC*,Manchester,1988,pp.147-151.
- [7] N.Dalal and B.Triggs, "Histograms of Oriented Gradients for Human Detection," in *CVPR*,San Diego,2005,pp.886-893.
- [8] N.Dalal ,B.Triggs and C.Schmid, "Human Detection using Oriented Histograms of Flow and Apperance,"in *ECCV*,Graz,2006,pp.428-441.
- [9] B.Lucas and T.Kanade, " An Iterative Image Registration Technique," in *IJCAI*, Vancouver,1981,p.674-679. [10] B.Horn and B.G.Schunck, " Determining Optical Flow," *Aritificialnetelligence*, vol.17,pp.185-203,1981.
- [10] Chathuramali, KG Manosha, SameeraRamasinghe, and Ranga Rodrigo. "Abnormal activity recognition using spatio-temporal features."In *7th International Conference on Information and Automation for Sustainability*, pp. 1-5.IEEE, 2014.
- [11] Santhiya, G., K. Sankaragomathi, S. Selvarani, and A. Niranjil Kumar. "Abnormal Crowd Tracking and motion analysis." In *Advanced Communication Control and Computing Technologies (ICACCCT)*, 2014 International Conference on, pp. 1300-1304. IEEE, 2014.
- [12] Tripathi, Vikas, Ankush Mittal, DurgaprasadGangodkar, and Vishnu Kanth. "Real time security framework for detecting abnormal events at ATM installations." *Journal of Real-Time Image Processing* (2016):
- [13] Popoola, Oluwatoyin P., and Kejun Wang. "Video-based abnormal human behaviour recognition—a review." *IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews)* 42, no. 6 (2012): 865-878.
- [14] Sujith B "Crime Detection and Avoidance in ATM: A NewFramework", (*IJCSIT International Journal of Computer Science and Information Technologies*, Vol. 5 (5) , 2014.
- [15] Xinyu WU, Yongsheng OU, Huihuan QIAN, and Yangsheng XU, "A Detection System for Human Abnormal Behavior".