

# UNUSAL EVENT DETECTION FOR ENHANCING ATM SECURITY

Chaitra.K<sup>1</sup>, Deeksha Naik<sup>2</sup>, Divya.C<sup>3</sup>, Harshitha.L<sup>4</sup>

<sup>1-4</sup>Dept of ECE,, Rajarajeswari College of Engineering, Bangalore, India.

## ABSTRACT

*In real world applications, tracking target in low resolution video is a challenging task because there is loss of discriminative detail in the visual appearance of moving object. The existing methods are mostly based on the enhancement of LR (low resolution) video by super resolution techniques. But these methods require high computational cost. This cost further increases if we are dealing with events detection. In this paper we present an algorithm which is able to detect unusual events without such type of conversion and well suited for enhancement of security of ATMs where conventional low resolution cameras are generally used due to their low cost. Proposed algorithm only uses close morphological operation with disk like structuring element in the pre-processing steps to cope up with low resolution video. It further uses rolling average background subtraction technique to detect foreground object from dynamic background in a scene. Our proposed algorithm is able to recognize the occurrence of uncommon events such as overcrowding or fight in the low resolution video simply by using statistical property, standard deviation of moving objects. It is fast enough because it process low resolution frames and could be helpful in surveillance system for enhancing the security of ATMs where conventional camera of low resolution are still used. It does not use any classifier and avoids the requirement of training the system initially.*

**Keywords:** Object Tracking, video surveillance, Unusual event detection, background subtraction, ATM security

## 1. INTRODUCTION

In the past few decades, significant efforts in the field of moving object detection and tracking have been done to make following applications reliable, robust and efficient: video surveillance, robotics, authentication system, media production, biological research etc. But there are many challenges which produce hurdles in the improvement of these applications. These challenges may include illumination change, dynamic background, camouflage, occlusion, shadow etc. These obstacles become more cumbersome when we perform object tracking in low resolution video. In low resolution video it is very difficult to accurately find out the object of interest because most of the discriminative details such as visual features and primitives have been lost. It results in inaccurate object tracking which further lead to inefficient event detection. But there are certain benefits of using low resolution video such as it requires low storage, transmission time and processing time.

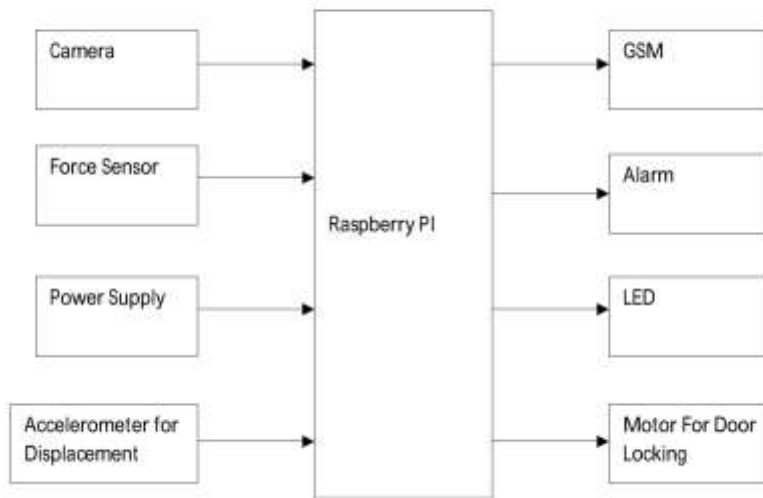
This paper presents an algorithm which is able to detect unusual event in low resolution video. Typical application of our proposed approach is to enhance the security of ATM without removing conventional low resolution camera. It uses rolling average background subtraction technique to segment foreground object from scene with dynamic background and preserves object features to an extent by simply applying morphological operations with the suitable structuring element. It also does not need any classifier and training dataset. It only uses statistical property standard deviation of the centroids of the blobs to recognize the occurrence of the abnormal events.

## 2. RELATED WORK

Unusual event detection in low resolution video for enhancing ATM security: ICMIC, 2013 International conference, 08 August 2015, In this paper we recognize the occurrence of uncommon events such as overcrowding or fight in the low resolution video. We use standard deviation of moving objects. Autonomous fall detection with wearable cameras by using relative entropy distance measure: IEEE Transactions on Human Machine Systems, 10 November 2016, In this paper the static sensors installed at fixed locations the camera is owned by subject and thus

monitoring is not limited where the sensors are located and extends wherever the subject travels. We use a modified version of the histograms of oriented gradient (HOG). Video inpainting model for camera motion based on background subtraction: ICMIC, 2013 International conference, 18 August 2013, In order to solve the difficulty of building a model of the background and improving the accuracy of the update rate in the background subtraction a new detection moving object method combining the surf algorithm and the background subtraction is proposed in this paper.

### 3. PROPOSED SYSTEM



**Fig-1** : Block Diagram of Proposed system

The proposed system unlike other systems uses a number of smart sensors to detect an attack and avert it, like PIR (Passive Infrared) Sensor, ADXL335 Accelerometer, FSR (Force Sensitive Resistor) to detect motion, heat, change in orientation, sudden acceleration, force, and vibration. The controller used here is the popular Raspberry Pi3 from Raspberry. This system is built around the Raspberry Pi 3 microcontroller which belongs to the Raspberry Pi family. The system continuously monitors its surroundings by sensing temperature changes, force, and orientation of the ATM using the sensors. Here we can see the basic block diagram of the proposed system shown in above Figure

1. Continuous monitoring of the sensors in the system so that any burglary attempt is detected.
2. Informing the controller that the sensors have been triggered and necessary safety actions are due.
3. Siren: The controller then activates the alarm system through the driver to dissuade the burglary attempt.
4. Warning: The controller then sends an SMS alert and call alert to officials informing the break in happening.
5. Shutter locking: The controller then activates the motor locking down the kiosk and the culprits are locked inside.

### 4. CONCLUSION

In this paper we have proposed an algorithm which is able to detect unusual event such as fight and overcrowding situation within the ATM of different banks. This proposed algorithm could be helpful to enhance the security of ATM. The results show that above algorithm efficiently applicable on low resolution video, only by applying some preprocessing. There is no need of using high computational scheme that enhance low resolution videos by super resolution techniques. In the future work this work can be extended to detect more uncommon

events in ATM such as attempt to steal the ATM, Harming the ATM screen and theft within the ATM. This scheme could be further moderated for that situation where one ATM room consists of two or more ATM machines.

## 5. REFERENCES

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