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# Moving Object Detection in Low-Illuminance Video

***Sapana Shelar [1],Asha Ahire[2]***
***Rozmin Sayyed [3],Pratiksha Pagare [4]***
***N.M. Ranjan [5]***
Computer Department,
K.K.Wagh Institute of Engineering Education & Research, Nashik
Email :[1]sapanashelar2015@gmail.com, [2]ahireasha2@gmail.com

***Abstract***

*The security is a main threat exists in every real-time system. The systems like disaster-prevention, crime-prevention and boarder security needs highly secured mechanism to alert the people about the incident happening in near about area. Camera system is widely used to monitor the area where security is crucial like for disaster-prevention and crime-prevention. However, at low-illuminance condition, the performance of normal cameras is degrade in great extent. At low-illuminance condition night vision cameras are developed and used but they do not support moving object detection.* Also the Gaussian filter technique is used in the system *requires the large amount of calculation so the time requirement is also large. Therefore, it is conceivable that the Gaussian filter is not suitable for real time video processing. In this system, input which is low-illuminance video is first denoised using a moving average filter. In that candidate regions of moving object are found by differencing between transformed current image and recent previous image. Moving object is finally decided by combined feature set and motion analysis. Object is tracked by matching object components in ROI. In the motion detection for low-light video images, it is possible to improve the accuracy of recognition by intensity correction and noise removal as preparation. After the detection security system will generate the alert.*

***Keywords:*** *Detecting moving object, Motion Analysis, Edge Detection, Color Analysis, Object Classification, Video Surveillance.*

## INTRODUCTION

Video surveillance system for low-illuminance environment will be designed and implemented. This system made up of two entities as server and client. The server is one who mainly functioning for the video acquisition and encoding the video using H.265 video encoding mechanism. The real time transmission protocol (RTP) is used for the video transmission. The client receive the data from server and perform and the decoding as well as playback. Because of the limited storage capacity of mobile devices, the server implements the motion detection function, which only stores the critical information. It can provide emergency alert about emergency situations. This system has a good mobile performance and transmission stability. It is intelligent, convenient and practical.

The security cameras are useful in various scenes such as disaster-prevention and crime-prevention. However, normal type video camera may not be suitable for low-illuminance video image such as night vision. In that case, the moving object detection becomes difficult. Therefore, we have researched on moving-object detection for low-illuminance video image. Until now, we have been researched the combination of gamma correction and Gaussian filter. However, the Gaussian filter spends the large amount of calculation. Therefore, it is conceivable that the Gaussian filter is not suitable for real-time video processing. Therefore, we

consider the use of denoising moving average filter instead of gaussian filter.

## LITERATURE REVIEW

The traditional video surveillance used to implement the monitoring system. It needs someone to guard in front of the monitoring equipment, which often brings a lot inconvenience to the monitoring. In order to meet the demand of market, mobile, high dentition, and intelligent will be the future development trend of the surveillance technology [2].

Exiting system: The server captures the data of real-time images through the camera and creates a Sever Socket object at the server side program to monitor the connection request from a client [4]. When the server receives the connection request from a client, it begins to compress the raw data using the H.264 encoding, followed by delivering to the transport layer protocol by the RTP packet, and then packages and sends through UDP protocol. The video transmission uses RTP protocol [3]. The client is responsible for receiving data, and completing the decoding and playback.

Problems in the system are as follows:
The CCTV System is detection after cause system While Proposed system is prevention System by creating an alert
–CCTV system requires additional hardware such as camera, dvr, hard drive etc.
– Recording from remote location can't be viewed.
– Motion detection does not exist.
– Night vision cameras are costly.
– Alert is not sent to user at remote location.
– H.265 encoding mechanism is not present.

## SYSTEM IMPLEMENTATION

### System Architecture

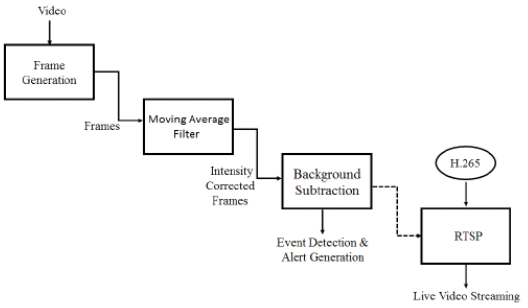


***Fig 1:*** *System Architecture*

### Methodology

**1) Frame Generation:** The frames are generated from the continuous stream of low-illuminance video. It will make the further processing of low-illuminance video easier.
**2) Moving average filter:** RGB to HSI conversion model is applied to the frames generated in the frame generation module. This will generate the intensity corrected frames. Further the intensity corrected frames are denoised using the moving average filter technique.
**3) H.265:** Once the motion is detected the event is triggered so automatic alert is generated to the user and the video recording of the scene is started. This captured scene is encoded using the latest H.265 encoding technique so that the memory space need is decreased and video gets compressed.
**4) RTSP:** The real time streaming server is created. The RTSP server module will perform the decoding of the encoded and compressed video and generates the live streaming to the end user at that movement to analyse the complete scene.

### Algorithm

- **Moving Average Filter:**
- Take video image as an input.
- Pixel wise image intensity identification.
- Gamma Correction Method using following formula[1]:

- Calculate the average values of moving and non-moving pixels.
- Check whether average value is less than
- Pass the gamma corrected image for background subtraction.

**Background Subtraction**

$V(x,y,t)$ as a video sequence where $t$ is the time dimension, $x$ and $y$ are the pixel location variables.

- An image as background and take the frames obtained at the time t, denoted by I(t) to compare with the background image denoted by B.
- Take the pixel value denoted by P[I(t)] and subtract it with the corresponding pixels at the same position on the background image denoted as P[B].
- P[F(t)]= P[I(t)]- P[B]
- A threshold "Threshold" is put on this difference image to improve the subtraction.
- P[F(t)]- P[F(t+1)] > Threshold

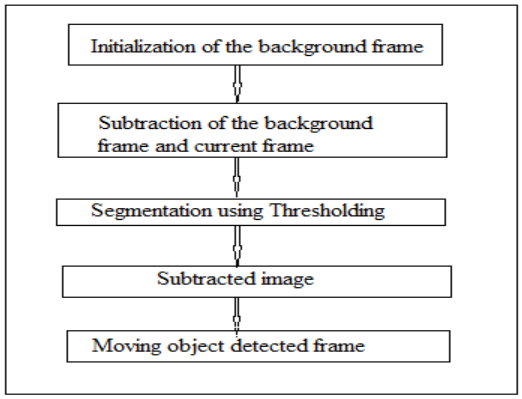


***Fig 2:*** *Background Subtraction Algorithm*

## CONCLUSION

The system to be developed is an automated system using a computer vision techniques and image analysis to perform video monitoring in low-illuminance environment. This system will provide safety in low-illuminance environment from crimes using motion detection. Thus we will be implementing denoising filter and motion detection System for low-illuminance environment. Method that combination of the Intensity correction using denoising filter is used as an image correction method for motion detection by inter-frame difference. So, it will be possible to provide the adequate result using the moving-average filter in the motion detection algorithm for low-illuminance video.

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