

MOTION DETECTION USING CAUCHY DISTRIBUTION AND SENDING IMAGE OVER ANDROID SMART PHONE USING GCM ALERT

Aswini.R^{*1}, *Nandhini.G*^{*2}, *S.S.G.KrishnanAP/IT*^{#3}

[*1aswiniit25@gmail.com](mailto:aswiniit25@gmail.com), [*2nandhinig27@gmail.com](mailto:nandhinig27@gmail.com), [#3ssgkrishnan@gmail.com](mailto:ssgkrishnan@gmail.com)

Department Of Information Technology

SKP Engineering College

ABSTRACT:

Video surveillance systems are becoming increasingly important for crime investigation and the number of cameras installed in public space is increasing. However, many cameras installed at fixed positions are required to observe a wide and complex area. In order to efficiently observe such a wide area at lower cost, mobile robots are an attractive option. According to the result of moving object detection research on video sequences, the movement of the people is tracked using video surveillance. The moving object is identified using the Background subtraction. The Background subtraction will compare the current frame with the previous frame. The threshold value is calculated to find the moving image. Using threshold value the detected pixel is identified. Hence the movement of the object is identified accurately. The motion detection is done using Cauchy distribution model and Absolute Differential Estimation. Absolute Differential Estimation is used to compare the background frame and incoming video frame if any changes occur in incoming video frame. Cauchy distribution Model is used to detect the pixel of moving object in the detected incoming video frame. Whenever motion detected that image is saved on the server and the server will notify the Google server. The Google server will send a GCM Alert to the android application user mobile who are all registered for that application.

KEY WORDS:

Video surveillance, Cauchy distribution model, GCM (Google Cloud Messaging), Android smart phone.

INTRODUCTION:

Surveillance is the monitoring of the behaviour, activities, or other changing information, usually of people for the purpose of influencing, managing, directing, or protecting. Surveillance is therefore an ambiguous practice, sometimes creating positive effects, at other times negative. It is sometimes done in a surreptitious manner. According to the result of moving object detection research on video sequences, the

movement of the people is tracked using video surveillance. The moving object is identified using the Background subtraction. The Background subtraction will compare the current frame with the previous frame. The threshold value is calculated to find the moving image. Using threshold value the detected pixel is identified. Hence the movement of the object is identified accurately. After motion detection it will send GCM alert to the android mobile application. The existing background subtraction methods can detect moving objects by estimating the absolute difference between each incoming video frame and the background model. There is no accuracy in the captured image. The moving object cannot be detected correctly. SMS alert about the motion

detection to the user. Image cannot be retrieve at the time of motion detection. In the Proposed system, the moving object is identified using the image Cauchy distribution model method. The pervious frame is compared with the current frame. From that the moving object is identified. Here we can detect the exact image of the moving object. Another advantage of this system is when the threshold value is reaching the limit that time server detected as a motion. Then the system will alert the user automatically by sending a GCM alert to user's mobile application. User will be using Android Mobile for the Retrieval of Images from the remote place to know whether those images are important and can be ignored. High accuracy in image capturing. Image can be stored in the server and can be view at the time of motion detection.

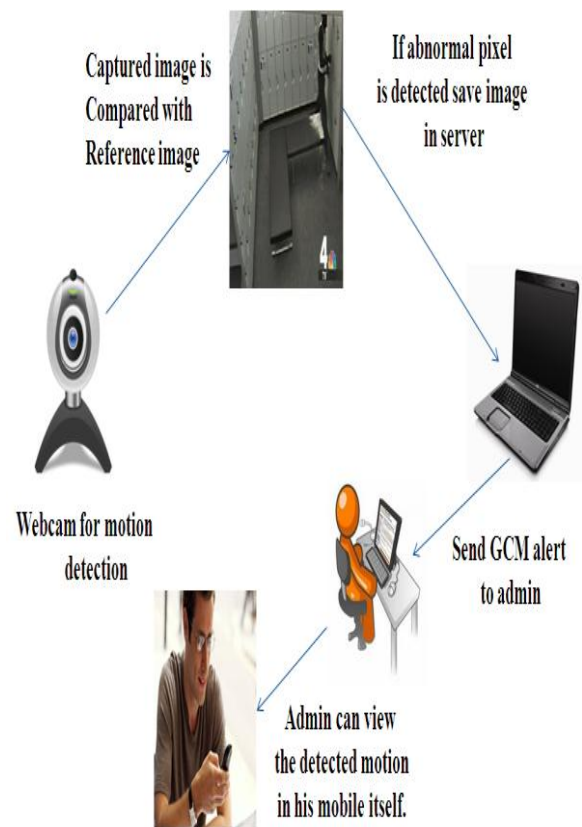
METHODOLOGY:

Human quest for an automatic detection system of everyday occurrence lead to the necessity of inventing an intelligent surveillance system which will make lives easier as well as enable us to compete with future technology and on the other hand it pushes us to analyze the challenge of the automated video surveillance scenarios harder in view of the advanced artificial intelligence. Nowadays, it is seen that surveillance cameras are already prevalent in commercial establishments, with camera output being recorded to tapes that are either rewritten periodically or stored in video archives. To extract the maximum benefit from this recorded digital data, identify any moving object from the scene is needed without engaging any human eye to monitor things all the time. A typical method is background subtraction. Many background methods have been introduced to deal with different problems. One of the successful solutions to these problems is to use a multi-colour background model per pixel proposed by Grimson. However, the method suffers from slow learning at the introducing, especially in busy environments. In addition, it cannot difference between moving shadows and moving objects. Image background and foreground are needed to be separated, processed and analyzed. The data

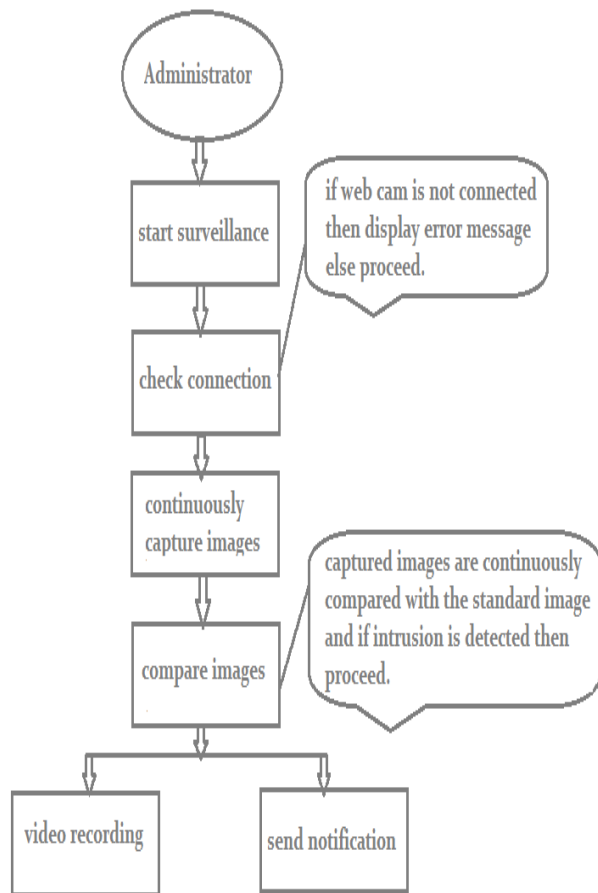
found from it is then used further to detect motion. In this project work robust routines for accurately detecting and tracking moving objects have been developed and analyzed. The new method currently operates on video taken from a stationary camera. The traditional real time problems are taken under consideration including shadow interference while detecting motion. An improved Cauchy distribution model detect the image by pixel, hence user can view a clear image.

ARCHITECTURAL MODEL:

The architecture of the system design specification



Data flow diagram:



STEPS TO BE FOLLOW:

There are four modules can be implemented and follows as

- Detecting Motion using Cauchy Distribution Model
- Sending GCM Alert
- User Registration for Application
- Viewing the Detected Image

User Authentication for Application

User authentication is a means of identifying the user and verifying that the user is allowed to access some restricted service. The main aim of this module is to authenticate the user to application to view the motion detected image. These modules include username and password for authentication to application. The validation is based on web service in server

VIEWING THE DETECTED IMAGE

Android application will receive the notification (GCM) based on project id which is registered in Google account. Application id will unique for each application. After receiving the GCM alert from the server to the application and the user needs to authenticate for the application. The image can be viewed using the URL which is received from the GCM alert.

DETECTING IMAGE USING CAUCHY DISTRIBUTION MODEL

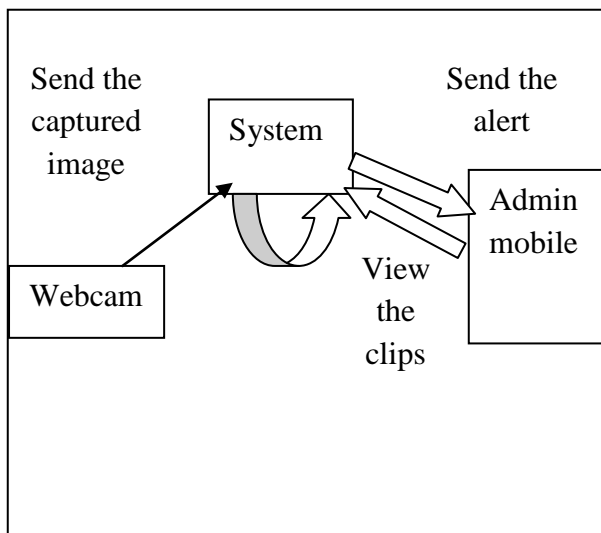
The Main aim of this module is to detect the motion in the particular area. The motion detection is done using Cauchy distribution model and Absolute Differential Estimation. Absolute Differential Estimation is used to compare the background frame and incoming video frame if any changes occur in incoming video frame. Cauchy distribution Model is used to detect the pixel of moving object in the detected incoming video frame.

SENDING GCM ALERT

Whenever motion detected that image is saved on the server and the server will notify the Google server. The Google server will send a GCM Alert to the android application user mobile who are all registered for that application. Google Cloud Messaging for Android (GCM) is a service that allows you to send data from your server to your users' Android-powered device. This could be a lightweight message telling your app there is new data to be fetched from the server (for instance, a movie uploaded by a friend), or it could be a message containing up to 4kb of payload data (so apps like instant messaging can consume the message directly).

FLOW OF THE SYSTEM BEING PROPOSED

The following diagram shows the flow of our system and the processes involved.



Flowchart of the proposed system the administrator starts the video surveillance system. As soon as the surveillance system is initialized, the system checks if the web camera is connected or not. If the web camera is not connected to the system then it will display an error message. Otherwise, the system continuously starts capturing images. A standard image is already stored in a separate file. The captured images are continuously compared with this standard image and are checked for any intrusion. In case of intrusion, a SMS will be sent to the administrator/owner for appropriate action to be taken. User can then login to the surveillance web application to view the most recent videos. The system waits for a specified amount of time for response commands (SMS) from any of the owners, after which it takes necessary action itself. E.g. the device starts alarming. It can store mobile numbers for all the administrators/owners who need to be contacted in case of emergency. The system keeps track/log of all the activities. Hence detailed record of messages sent and received is maintained. Administrator can send commands to control switch on/off of the device. User can also send a series of command sequences scheduled for a later time the commands will be executed automatically at the server when the time arrives System receives commands from administrators which are then used to take necessary actions. The commands may include Activating/deactivating a rely, setting etc. The system only responds to owners mobile numbers. SMS received from any other mobiles will be

rejected. Moreover the communication via SMS is password protected. Hence any other user cannot control the system from one of the owner's mobile number. The entire Smart surveillance is made remote using this architecture.

Evaluation of The Proposed System:

In the Proposed system, the moving object is identified using the image Cauchy distribution model method. The pervious frame is compared with the current frame, the moving object is identified. Here we can detect the exact image of the moving object.

Benefits of Proposed System:

1. Our system allows user to view videos even if he is at some remote place. The system provides the functionality of online video streaming so that user can view the videos from web browser.
2. Our system provides a software solution for image matching and intrusion detection. We do not require use of any additional hardware for this purpose.
3. Our system uses image matching technique, so it gives more precise and accurate results.
4. Entire Smart surveillance can be made remote using this architecture. User can even control the system through a remote place. He can give commands to switch on/off the system.
5. The system provides real-time monitoring. The user is notified as soon as the intrusion is detected. Thus, the user can take appropriate action without any delay.
6. Surveillance is integrated with intelligent video movement detection analysis systems combine with SMS, GCM alarm notification system.

CONCLUSION

This project introduced an approach for an effective video surveillance in the current system; this overcomes the traditional Surveying where

Human intervention is needed and has to watch keenly for keeping track of the entire system. But now with this project we have introduced a unique technique which is a Major advantage to the old system. Here usage of Android Smartphone's is essential, in order to effectively capture the image. This project also has a unique feature in which it sends a GCM alert at once there is any sort of variation in the captured pixel. Also we are in intent to dedicate this project to many important Surveillance Areas so that Many Unwanted things can be prevented.

FUTURE ENHANCEMENT

Though this project has many added advantage, in future we like to upgrade this into the next level that is not only by just viewing the captured image, we can also view the entire clip of what happened and what has been captured. All this will be done just at the spontaneous moment, within seconds of the action been happened at the site.

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