INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Minimization of Storage on Moving Objects in Video Surveillance

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Abstract: Investigation and so the number of surveillance cameras installed in public space is increasing. Many cameras installed at fixed positions are required to observe a wide and complex area, so observation of the video pictures by human becomes difficult. So there is a need for automation and dynamism in such surveillance systems. In order to allow the different users (operators and administrators) to monitor the system selecting different Quality of Service (QoS) are required depending on the system status and to access live and recorded video from different localizations i.e. from their mobile devices. More concretely, in Internet Protocol (IP) surveillance systems some resources involved are limited or expensive. So a technology using automatic detection of intruders (using image processing systems) and automatic alert systems will provide competitive advantage for surveillance systems. Video surveillance systems are the most important for crime investigation. Detection of suspicious human action is of great practical importance. Due to random nature of human movements, reliable classification of suspicious human movements can be very difficult. Our primary aim is to bring out a solution for the memory consumption during video recording and the problem of automatically tracking people and detecting unusual or suspicious movements in Closed Circuit TV (CCTV) videos. Our work presents a frameworkthat processes video data obtained from a CCTV camera fixed at a particular location. It is also used to reduce the storage location of recording videos as the videos will be recorded statically.

I. INTRODUCTION

The surveillance based service protects a particular place from the unauthorized person and alert the user by sending message if unauthorized person enters.Surveillance is the monitoring of the behavior, 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. It most usually refers to observation of individuals or groups by government organizations, but disease surveillance, for example, is monitoring the progress of a disease in a community.

The word surveillance is the French word for "watching over"; "sur" means "from above" and "veiller" means "to watch". The inverse (reciprocal) of surveillance ("to watch from below"). The word surveillance may be applied to observation from a distance by means of electronic equipment (such as CCTV cameras), or interception of electronically transmitted information (such as Internet traffic or phone calls). It may also refer to simple, relatively no- or low-technology methods such as human intelligence agents and postal interception.

Surveillance cameras are video cameras used for the purpose of observing an area. They are often connected to a recording device or IP network, and may be watched by a security guard or law enforcement officer. Cameras and recording equipment used to be relatively expensive and required human personnel to monitor camera footage, but analysis of footage has been made easier by automated software that organizes digital video footage into a searchable database, and by video analysis software (such as VIRAT and Human ID).

The amount of footage is also drastically reduced by motion sensors which only record when motion is detected. With cheaper production techniques, surveillance cameras are simple and inexpensive enough to be used in home security systems, and for everyday surveillance.

In the United States, the Department of Homeland Security awards billions of dollars per year in Homeland Security grants for local, state, and federal agencies to install modern video surveillance equipment. For example, the city of Chicago, Illinois, recently used a $5.1 million Homeland Security grant to install an additional 250 surveillance cameras, and connect them to a centralized monitoring center, along with its preexisting network of over 2000 cameras, in a program known as Operation Virtual Shield. Speaking in 2009, Chicago Mayor Richard Daley announced that Chicago would have a surveillance camera on every street corner by the year 2016

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue III, Mar 2019- Available at www.ijraset.com

A. Existing System

The Existing methodology is a switch is attached to the door which detects any intrusion attempted by intruders. Image is can be stored in the server and it can be retrieve after some time The interrupts GSM modem and the modem sends a per-configured warning SMS to the mobile phone in the remote location. Moreover there is no alert system to inform the admin when unknown object is detected. If the user acknowledges the pop-up, immediately a message is send back to the remote modem. There is no accuracy in the captured image. The moving object cannot be detected correctly. MS alert about the motion detection to the user. Image cannot be retrieve at the time of motion detection. Traditional video surveillance takes a huge amount of storage space. Recording everything captured by a surveillance camera consumes the large storage space and hence limits the duration of video that can be stored. In addition, recording everything makes it time-consuming for a human to review the stored video. The study helps in maximizing data storage while recording videos by removing the appearance of frames with similar images in a sequence. The IP Camera captures the video first then the program loads captured video to be processed. Then, the Image processing and the Application of Genetic Algorithm follows. Lastly, the optimized video is to be outputted. The optimized video will then be analyzed for the amount size lost from the original.

B. Proposed System

In the Proposed system, the moving object is identified using the image Cauchy distribution model method. The previous 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. Controlling home appliances remotely with mobile applications have started becoming quite popular due to the exponential rise in use of mobile devices. 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 Send an SMS alert to user's mobile whenever a Moving object is detected Image can be stored in the server and can be view at the time of motion detection. User can view the image, via his Android mobile itself. In this study, a real-time intelligent surveillance system capable of analyzing and detecting alarm events was created. Using a gray scale camera to get the input and applying some image processing operations, the desired data were acquired which can use by the system as data by identifying of interest, tracking the aforementioned objects, and analyzing their behavior. A technology for detecting and tracking objects has been presented in the research that is consist of IP Camera and NVR. The proposed algorithm consists of two parts of detecting the moving objects and tracking them. The detecting stage is performed through the extraction of moving objects by RGB BM. The tracking stage is activated when a moving object is detected. The tracking stage uses the geometric information of groups such as the previous position, the variation.

Cauchy Algorithm for Motion Detection Cauchy algorithm is used for an optimal determination of transforming for every compared object. The system uses the changes in brightness level value to identify the movement. With the use of move analysis method, the system analyze the difference between two image sequence captured in a sequence of digital still images which is time-spatial images. There is an android code used to detect motion by comparing two images. It comes with an activity that initializes a camera that grabs two images and compares them. The programmer creates a Motion Detection class used to detect motion by comparing RGB values called RGB Motion Detection, a class that detects motion by comparing the luminance values called LumaMotionDetection.java, and using another class called AggregateLumationDetection.java used to detect motion by comparing the luminance value in regions. Cauchy algorithms are used as a tool which lets to put in order a chaotic (random) objects collection .And this algorithm help the system to mark or label object on each frame..

C. Google Cloud Messaging

Google Cloud Messaging (GCM) is a service that helps developers to send data from servers to their Android applications on Android devices, or from servers to their Chrome apps and extensions. Google Cloud Messaging for Android (GCM) is a free service that helps developers send data from servers to their Android applications on Android devices, and upstream messages from the user's device back to the cloud. This could be a lightweight message telling the Android application that there is new data to be fetched from the server (for instance, a "new email" notification informing the application that it is out of sync with the back end), or it could be a message containing up to 4kb of payload data (so apps like instant messaging can consume the message directly). The GCM service handles all aspects of queuing of messages and delivery to the target Android application running on the target device.

Architecture Diagram
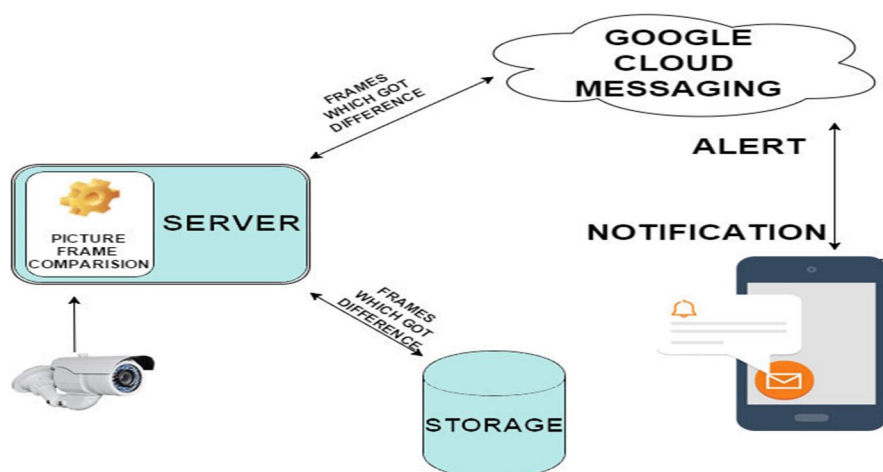
D. Dataflow Diagram

A DFD shows what kinds of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about the timing of processes, or information about whether processes will operate in sequence or in parallel.
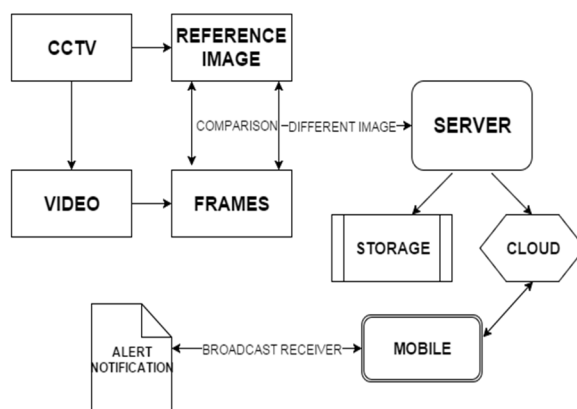

II.   MODULE DESCRIPTION

1) User Registration for Application
2) Detecting Motion using Cauchy Distribution Model
3) Sending GCM Alert
4) Viewing the Detected Image

A. 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 modules is to authenticate the user to application to view the motion detected image this module include username and password for authentication to application the validation is based on web service in server.
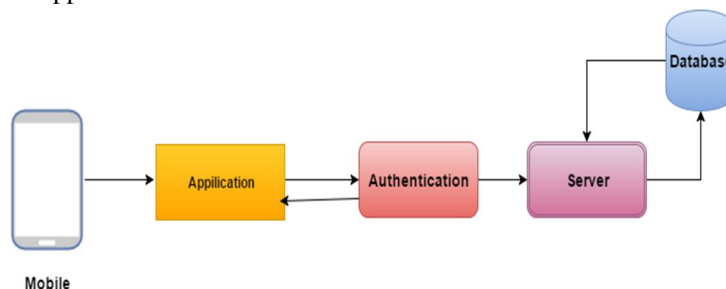
B. Detecting Image Using Cauchy Distribution Model

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.

Camera
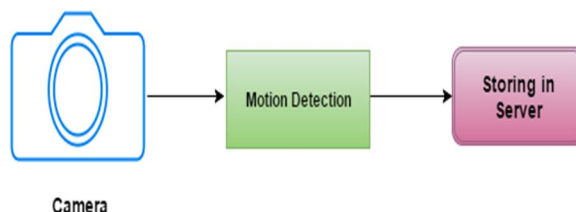
C. Sending GCM Alert

 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).
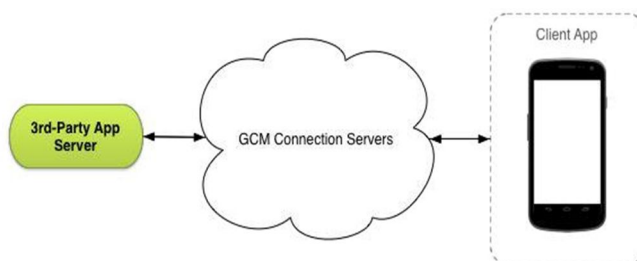
D. Viewing The Detected Image

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.

A moving security camera is positioned to monitor the area to detect a movement within that particular area.

A moving object is detected within the monitored area is the first phase. The detection of a movement uses a simple but efficient method of

Comparing pixel image values in subsequent frames captured every two seconds from the surveillance camera. Two images frames are needed to detect any movement.
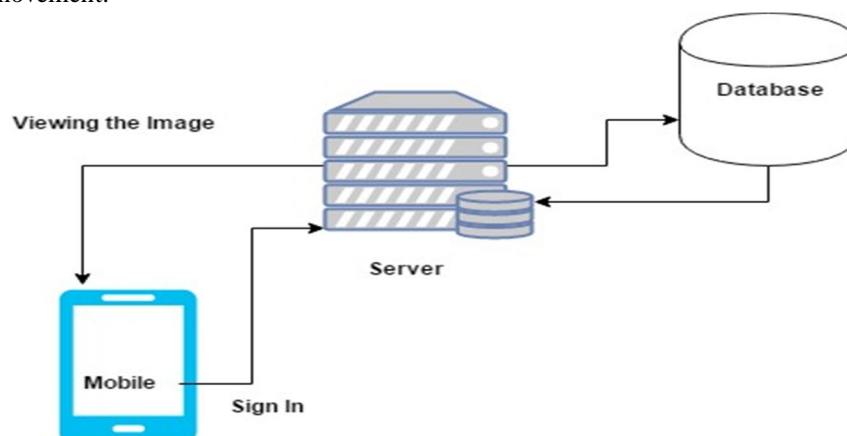
III.   ALGORITHMS

A.   Cauchy Distribution Model Algorithm

The Cauchy distribution, named after Augustin Cauchy, is a continuous probability distribution. It is also known, especially among physicists, Cauchy–Lorentz distribution, Lorentz function, or Breit–Wigner distribution.

The simplest Cauchy distribution is called the standard Cauchy distribution. It has the distribution of a random variable that is the ratio of two independent standard normal random variables. This has the probability density function Its cumulative distribution function has the shape of an arctangent function .The Cauchy distribution is often used in statistics as the canonical example of a "pathological" distribution. Both its mean and its variance are undefined. (But see the section Explanation of undefined moments below.)

The Cauchy distribution does not have finite moments of order greater than or equal to one; only fractional absolute moments exist. The Cauchy distribution has no moment generating function. Its importance in physics is the result of it being the solution to the differential equation describing forced resonance In mathematics, it is closely related to the Poisson kernel, which is the fundamental solution for the Laplace equation in the upper half-plane.
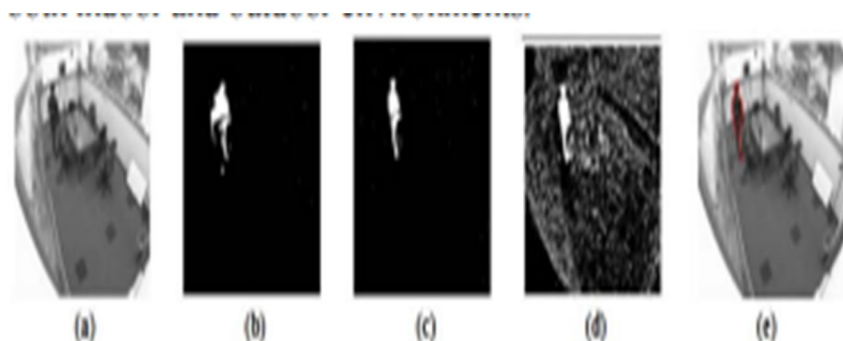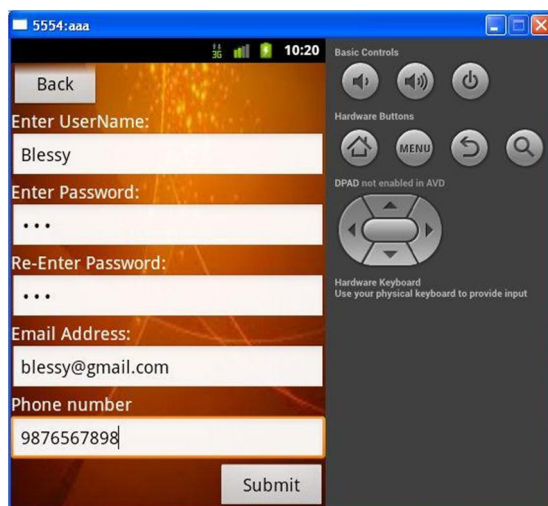
Fig. 9 Room Video Segment (a) Original frame, Motion detected using
(b) MTD (c) CMM (d) MGPF (e) BMOG
Cauchy algorithm

B.   Screenshots
1)   Login or Signup

2) Registration Form

3) Test On Motion Detection
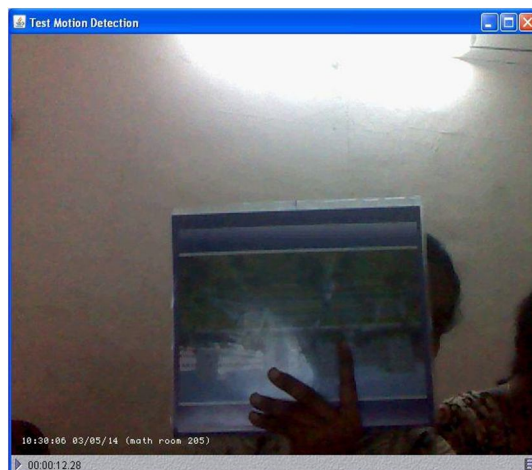
4) Gcm Video Surveillance Alert

5) After user authentication click the Submit button.
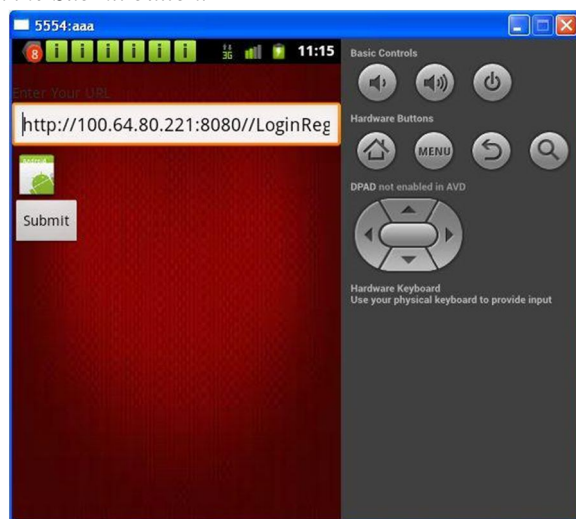
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List Of Books And Weblinks

A. Android Programming, and Book!release.002 by **Nicolas Gramlich**

B. Professional Android Application Development by Perth, Western Australia, Reto Meier in London.

C. = Android Open Source Project. Open Handset Alliance: http://source.android.com/license

D. Dalvik Debug Bridge Monitor Service: http://developer.android.com/guide/developing/tools/ddms.html

E. Official Android website: http://www.android.com/ Open Handset Alliance, website: http://www.openhandsetalliance.com/

F. Java Virtual Machine Tool Interface Spec:http://java.sun.com/javase/6/docs/platform/jvmti/jvmti.html

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