Surveillance of Object Motion Detection and Alert Using Android

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***Abstract*---Video Surveillance systems have increase their needs of dynamism in order to allow different users to monitor the system selecting different quality of service (QoS) depending on the system status and to access live and recorded video from different localizations, for example mobile devices. More concretely, in IP surveillance systems, some resources involved are limited or expensive so dynamic reconfiguration could become competitive advantage for system integrator and designers able to offer flexible applications which are adaptable to users' needs. This surveillance based service system provides security for particular place which alerts the user by sending alert messages. We discuss a new algorithm, Image subtraction algorithm that captures the image automatically and is saved in the server. The saved image is sent as an alert to the user mobile using Google Cloud Messaging (GCM).**

***Keywords*--Image subtraction algorithm, Google Cloud Messaging, Real-time traffic surveillance system**

I. INTRODUCTION

Surveillance is the monitoring of the behavior, activities, or other changing information, usually of people for the purpose of influencing, managing, directing, or protecting. 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. Service-Oriented approaches provide means of developing decoupled applications in heterogeneous networks by defining the concept of service. A service, in the SOA context, is an entity that receives and sends messages through well-defined interfaces, allowing building more complex applications that increase the value of the system. This concept can be applied to QoS-aware (Quality of Service) systems, in order to ease the configuration and reconfiguration of applications. Besides, Android is a software stack for mobile devices that includes an operating system, middleware and applications that can be suitable for the development of the end-user surveillance application. a model for quality-of-service (QoS)-aware service composition in distributed systems with real-time and fault-tolerance requirements. This model can be applied in application domains like, for example, remote monitoring, control and surveillance. Classic approaches to real-time systems do not provide the flexibility and fault-tolerance required in new emerging environments that need to combine a high degree of dynamism with temporal predictability. Our approach addresses these new challenges by combining concepts from the service oriented paradigm and distributed real-time systems. We propose a concrete system model based on a holistic time-triggered-based approach for design and configuration. Based on this model, we propose two algorithms for the composition of QoS-aware service-based applications with temporal requirements: an exhaustive algorithm that computes the optimal service combination in terms of a figure of merit, suitable for offline composition; and an improved algorithm based on heuristics and partial figures of merit, suitable for online composition. Experimental results show that the latter reduces dramatically the number of combinations explored with a minimal degradation in the quality of the solution, making it feasible for online execution in dynamic environments. Since the web has evolved as a service provider in all areas, there are few problems which are to be handled. Some challenges faced by web services are related to security, quality of service and composition. Among all the challenges, web service composition turns out to be an area of major research, because it supports business-business or enterprise application integration. With the emergence of semantic web the scope for semantic based web services composition increases as it provides better results compared to the traditional method of discovering candidate services for composition. Along with the semantics the nature of composition also needs to be dynamic as the web services and its parameters are changing frequently. Processing a video stream to segment foreground objects from the background is a critical first step in many computer vision applications. Background subtraction (BGS) is a commonly used technique for achieving this segmentation. The popularity of BGS largely comes from its computational efficiency, which allows applications such as human computer interaction, video surveillance, and traffic monitoring to meet their real-time goals. Numerous BGS algorithms and a number of post processing techniques that aim to improve the results of these algorithms have been proposed. In this paper, we Evaluate several popular, state-of-the-art BGS algorithms and examine how post-processing techniques affect their performance. Our experimental results demonstrate that post-processing techniques can significantly improve the foreground segmentation masks produced by a BGS algorithm.

II. RELATED WORK

Segmentation of foreground and background regions in image sequences is one of the most fundamental tasks in computer vision. The provided information is usually crucial for higher level operations such as visual surveillance. The obvious way to detect moving regions in image sequences is to select a reference frame while scene is stationary, and to subtract the observed frame from this image. The resulting difference image is threshold to extract the moving regions. Although this task looks like fairly simple, in real world applications this approach rarely works. Usually background is never static and varies by time due to several reasons. The most important factors are lighting changes, moving regions and camera noise. Moreover in many of the applications, it is desirable to model the different possible appearances of the background such as shadows. Background model is most similar to adaptive mixture models but instead of mixture of Gaussian distributions, we define each pixel as layers of 3D multivariate Gaussians. Each layer corresponds to a different appearance of the pixel. We perform our operations on (r,g,b) color space. Using Bayesian approach, we are not estimating the mean and variance of the layer, but the probability distributions of mean and variance. We can extract statistical information regarding to these parameters from the distribution functions. For now, we are using expectations of mean and variance for change detection, and variance of the mean for confidence. Prior knowledge can be integrated to the system easily with prior parameters. Due to computation of full covariance matrix, feature space can be modified to include other information sources, such as motion information, as discussed.

2.1 Real-time traffic surveillance system

A background scene dramatically changes over time by the shadow of background objects (e.g., trees) and varying illumination, the shadow moves with the wind in the trees, which makes the detection result too noisy. The moving objects have similar colors to those of the road and the shadow thus, the background may be falsely detected as an object. The vehicles waiting for a signal light corrupt the background model. The computation time needs to be low because most applications require real-time detection. Moving objects do not have uniform features; therefore, it is difficult to describe them during different periods of time with a statistic model. Thus, only neighboring spatial information is introduced for modeling the foreground model.

2.2 Moving object Detection Phase

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. The first frame is called reference frame, represents the reference frame values for comparison purpose, and the second frame, which is called the input frame, contains the moving object. The two frames are compared and the differences in pixel values are determined. Pixel values are threshold and saved in a third frame, which is called output frame, with a black or white background. If the "difference" average pixel value is smaller than a certain threshold value, then the output frame image will be white otherwise, the background will be black. After tracking the moving object motion, the previous input frame will now be used as a reference frame, and a third frame is captured and is called now the input frame. This process is repeated with the frames being captured every second, where the same method is applied. If there is a difference between the reference and input images frames, then an output image is created. The obtained output image contains an object that will be extracted.

III. PROPOSED WORK

There is no proper algorithm to detect the moving object. The moving object is identified using the some algorithms which are not exactly doing that detection works. The detected object can be stored in the server and it can be retrieve after some time. There is no alert system to inform the admin when unknown object is detected. In the Proposed system the moving object is identified using the image subtraction method. The background image is subtracted from the foreground image. 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 an unknown object is captured by the system it will alert the administrator automatically by sending a GCM alert to user's mobile. Administrator will be using Android Mobile for the Retrieval of detected Images from the remote place. Image can be stored in the server and can be view at the time of motion detection. Administrator can view the image using his Android mobile itself.

3.1 Image Subtraction algorithm

In this paper, a new algorithm for image subtraction is proposed. This algorithm is a meta-learning algorithm that incorporates multiple instantiations of the Mixture of Gaussian algorithm. By operating on 13 different image features, this algorithm demonstrates a significantly heightened performance on image sequences with varying Illuminations. A surprising consequence of this research was the exceptional performance of using only edge features for background subtraction.

The motivation for this work arose from the failures of mapping RGB color spaces to alternate color spaces that are ideally illumination invariant. This paper represents the first known work to fuse multiple unsupervised background classifiers. The image captured from the device is taken as a reference frame and newly captured image compares with the reference image. If there is any difference in the threshold value the newly detected image is saved in the server.

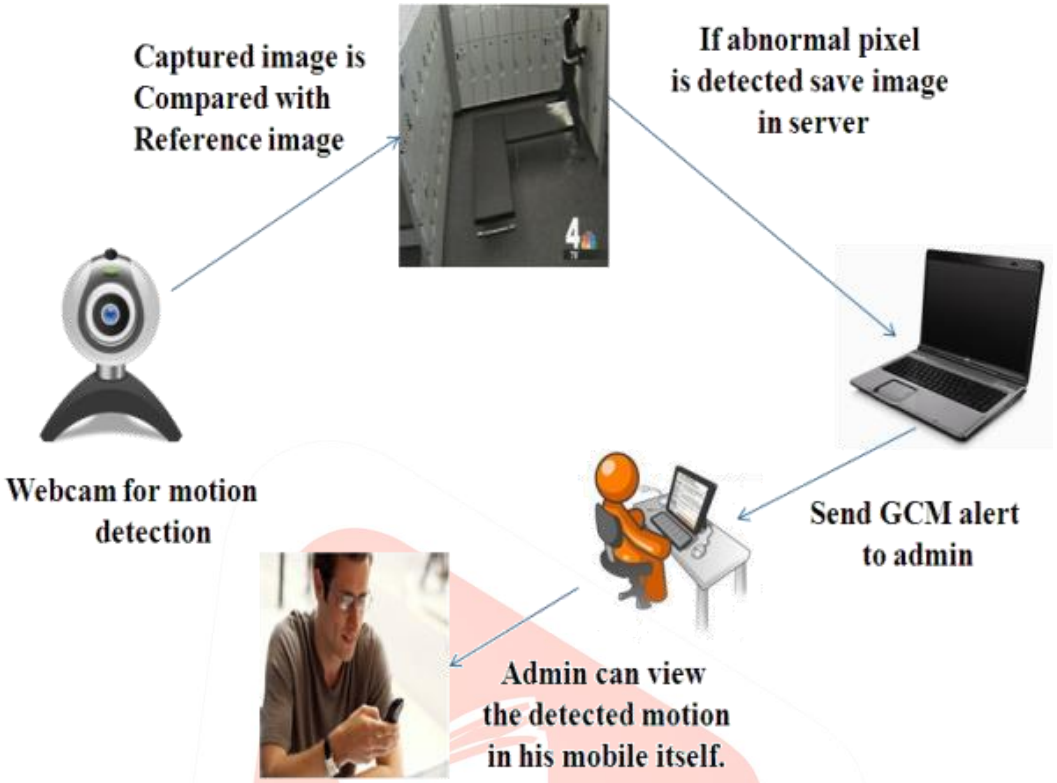

Fig. 1. System architecture

3.2 Google Cloud Messaging (GCM)

Google Cloud Messaging for Android (GCM) is a service that allows you to send data from your server to your users' Android-powered device, and also to receive messages from devices on the same connection. The GCM service handles all aspects of queuing of messages and delivery to the target Android application running on the target device. GCM is completely free no matter how big your messaging needs are, and there are no quotas.

Send data from your server to users' Android-powered devices

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).

GCM Architecture

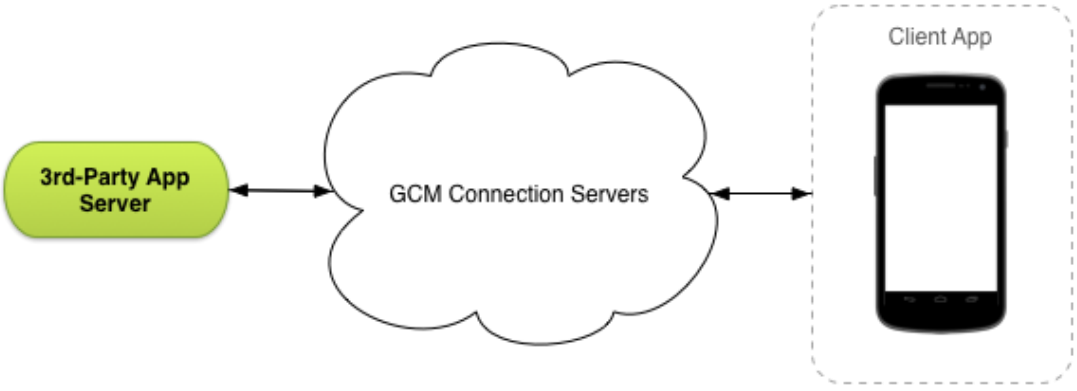

Fig. 2. GCM architecture

This is how these components interact

1. Google-provided GCM Connection Servers take messages from a 3rd-party application server and send these messages to a GCM-enabled Android application (the "client app") running on a device. Currently Google provides connection servers for HTTP and XMPP.
2. The 3rd-Party Application Server is a component that you implement to work with your chosen GCM connection server(s). App servers send messages to a GCM connection server; the connection server enqueues and stores the message, and then sends it to the device when the device is online. For more information, see Implementing GCM Server.
3. The Client App is a GCM-enabled Android application running on a device. To receive GCM messages, this app must register with GCM and get a registration ID. If you are using the XMPP (CCS) connection server, the client app can send "upstream" messages back to the connection server. For more information on how to implement the client app, see Implementing GCM Client.

IV. CONCLUSION

This paper 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.

REFERENCES

[1] J. Y. Hao, H. Shen, C. Li, Z. Xiong, and E. Hussain, "Vehicle behaviour understanding based on movement string," in Proc. 12th Int. IEEE Conf.Intell. Transp. Syst., 2009, pp. 243–248.
[2] T. B. Moeslund, A. Hilton, and V. Krüger, "A survey of advances in vision-based human motion capture and analysis," Comput. Vis. Image Understanding, vol. 104, no. 2/3, pp. 90–126, Nov./Dec. 2006.
[3] I. Haritaoglu, D. Harwood, and L. S. Davis, "W4: Real-time surveillance of people and their activities," IEEE Trans. Pattern Anal. Mach. Intell., vol. 22, no. 8, pp. 809–830, Aug. 2000.
[4] J. Yao and J. M. Odobez, "Multi-layer background subtraction based on color and texture," in Proc. IEEE CVPR, 2007, pp.1–8.
[5] JiuYue Hao, Chao Li, Zuwhan Kim, and Zhang Xiong, "Spatio-Temporal Traffic Scene Modeling for Object Motion Detection," in IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, VOL. 14, NO. 1, MARCH 2013, pp. 295-301.
[6] C. Stauffer and W. E. L. Grimson, "Adaptive background mixture models for real-time tracking," in Proc. IEEE CVPR, 1999, pp. 246–252.
[7] S. C. S. Cheung and C. Kamath, "Robust techniques for background subtraction in urban traffic video," Proc. SPIE-Int. Soc. Opt. Eng., vol. 5308,pp. 881–892, 2004.
[8] S. Atev, O. Masoud, and N. Papanikolopoulos, "Practical mixtures of Gaussians with brightness monitoring," in Proc. Int. IEEE Conf. Intell.Transp. Syst., 2004, pp. 423–428.