SOS security system adopting Gaussian method

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Abstract: *Improving an SOS security system adopting Gaussian method can be made possible by using the performance of difference in decibel calculations in transducers. Once if the difference in sound is analyzed by the transducer, several computer vision applications can be applied in security systems. So here we propose an assembly of security camera with low sound receiving transducer with a wireless universal serial bus modem to play a vital role in sending SOS message and maintaining the security. The proposed approach uses Gaussian comparison for approximate average and combination of Gaussian method proves that the chosen method has good performance under dynamic circumstances for real time tracking operations. Once if the sound is detected then transducers can generate enough amount of electricity that is enough to turn on the security video cameras within the environment to conform the case, various security functions such as HD video tracking, alerting the SOS, storing the video can be done sequentially.*

Keywords-**Gaussian algorithm, transducers, High Definition video tracking, noisy frequency, sound decibels**

I. INTRODUCTION

Advancing the security monitoring systems to a level of decision making will be a major trend in coming days, it is an important branch of research in the content of enhancing security and recently monitoring system has become commonplace. So, study on its related technology has great significance. Extracting the moving objects, in particularly are interesting and important in monitoring system because that it can contribute not only to theoretical insights but also to practical application. Computing the moving objects of the monitoring system could be applied to a wide variety of problems, including criminal identification, real time control system, traffic control, industry and civil monitoring, etc...

II. RELATED WORK AND STUDY

Present security systems at banks, gold shops, shopping malls, super markets, railway stations, airports, we adopt security cameras which are connected to a central monitoring server [9]. Data base administrators have to work round the clock to monitor is the videos being recorded from all the cameras [3][7]. These videos may be stored into the servers which may require zeta-bytes of memory space are a great problem in holding memory space. It becomes a risky task for the security system both to provide 24hours surveillance besides storing the captured videos also needs a very huge amount of memory space to the servers, it consumes storing and retrieval time too [12].Unfortunately present systems has problems in extracting the moving objects quickly and exactly from a real time stream image or monitoring video is quiet difficult, maintaining 24 hours admin support and continuous monitoring is highly difficult in a long run. This technique not only reduces money but also human effort in maintenance.

III. IMPACT OF SECURITY SYSTEM

In this technique will not increase the hardware or implementation cost over the entire architecture. Price of a transducer that is integrated to the system that predicts the sound and imitates the information to the system is very cheap as it is a direct Universal Serial Bus connective, it can directly be integrated to machine without using any connectors [7]. It indirectly improves quality of output by reducing the noise and distortions. Back ground subtraction using Gaussian is a simple unsupervised technique, so it can run on any simple machine and store the resultant in it. An integrated camera with changes in transducer architecture attached to it will even more reduce the price and error ratio inversely increases the quality of outcome and performance of entire system.

IV.TECHNIQUE AND OBJECTIVE

A. Working principle of transducer

A simple transducer is a sound receiver and a convertor, efficiency is an important consideration in any transducer. [2] Transducer efficiency is defined as the ratio of the power output in the desired form to the total power input. Mathematically, if P represents the total power input and Q represents the power output in the desired form, then the efficiency E, as a ratio between 0 and 1, is given by $E = Q/P$. If E% represents the efficiency as a percentage, then, $E\% = 100Q/P$[16]. usually this loss is manifested in the form of heat.

Figure (1): USB Transducer

Some antennas approach 100-percent efficiency [5]. A well-designed antenna supplied with 100 watts of radio frequency (RF) power radiates 80 or 90 watts in the form of an electromagnetic field. A few watts are dissipated as heat in the antenna conductors, the feed line conductors and dielectric, and in objects near the antenna.
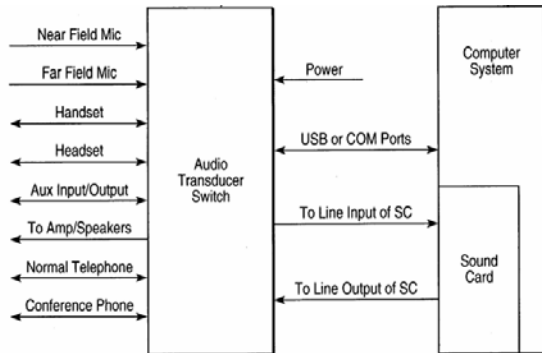

Figure (3): Architecture of audio transducer

B. Calculating dB in a quiet room

In general conditions a quiet room will be having a 25dB of sound, average house will be in 55dB and conditions where hammering, power saw and massive movements on the rooms will increase the sound up to 95 dBs' too. So we can easily calculate the change in sound within the safe room using the transducer [16]. In general condition when a room or a cabin is locked, it will be quite inside until the next morning. So it is east for the transducer to monitor the sound once it is turned on when the user turns it on while locking the room. Incase if no one enters the room the sound with in the room will be quite and no SOS or video recording will be done. If the anomaly is detected transducer


Figure (4): Server connected camera integrated to Modem

The sequence of steps followed in this project. The first Step is the input video taken for preprocessing. The pre-processing consists of color and frame conversion, which is represented in the consecutive blocks. After that, the current

frame is compared with the reference frame by considering the intensity variation.

A. Steps for sound and abnormality detection in real time tracking

➢ Transducer calculates the sound in the safe room (55+dB: Abnormal condition)

➢ Transducer generates electrical energy that is required for turning on the security camera

➢ SOS Short message service (…----…) signal will be sent at brief intervals
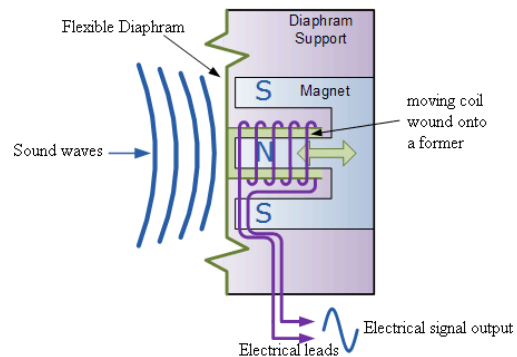
The detecting sound usually contain noise due to small movements like tree leaves, vehicles outside, horns and other sound disturbances. So dB should be considered such that it will be in between 45+dB to 65+dB. After this step, the individual pixels are grouped and labeled to create connected moving regions. These regions are further processed to group disconnected blobs and to eliminate relatively small sized regions. Once the Video surveillance starts recording after grouping, each detected foreground object is represented with center of mass and color histogram which will be used in later steps.

B. Adopting Gaussian technique

Gaussian is the simplest unsupervised learning technique to solve the well-known clustering problems. The procedure follows a simplest way to classify a given data set through a certain number of clusters (assume k clusters) in a fixed apriori. Here the main idea is to define n centers, one for each cluster. These centers should be placed in a cunning way because of different location causes different result. So, the best choice is to place them as much as possible far away from each other. The next step is to take each point belonging to a given data set and associate it to the nearest center. When no point is pending, the first step is completed and an early group age is done. At this point it needs to re-calculate k new centroids as barycenter of the clusters resulting from the previous step. After we have these k new centroids, a new binding has to be done between the same data set points and the nearest new center. A loop has been generated. As a result of this loop we may notice that the k centers change their location

step by step until no more changes are done or in other words centers do not move any more

C. Algorithmic steps for Gaussian clustering

Let X = {$x_1,x_2,x_3,……..,x_n$} be the set of data points and

V = {$v_1,v_2,…….,v_c$} be the set of centers.

1) Randomly select *'k'* cluster centers.

2) Calculate the distance between each data point and Cluster centers.

3) Assign data point to the cluster center whose distances are near tothe entire cluster

4) Recalculate the new cluster center using

$$v = (1/k_i) \sum_{j=1}^{k_1} x_i$$

Where, *'k_i'* represents the number of data points in i^{th}cluster.

5) Recalculate the distance between each data point and new obtained cluster centers.

6) If no data point was reassigned then stop, otherwise repeat from step 3.

VI. FUNTIONING OF THE SYSTEM

Whenever the difference in sound is detected, system sends an automated SOS message using the GSM Modem. GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves, an external GSM modem is connected to a computer through a serial cable or a USB cable. Like a GSM mobile phone, a GSM modem requires a SIM card from a wireless carrier in order to operate.

VI. CONCLUSION

Comparison of sound using dB difference, approximate medium, and combination of Gaussian can obtain a better secured system by using SOS alerting technique. A real-time background subtraction technique which can notice moving object on a background system can also be implemented using Java Media framework 2.1.1. From this it concludes the system can successfully resolve drop extraction in mixture of Gaussian dealing with the challenges of object extraction in dynamic environment, the results on several techniques show that this algorithm is efficient and robust for the dynamic environment with new objects in it. Recording the real time video & alerting via SOS as per availability which helps in improving the security.

VII. FUTURE SCOPE

As cameras are improving day by day and usage of high end technology is becoming cheaper, small and medium level business people also can use this kind of security system by integrating and enhancing it in such a way that it can send an automation message to the owner mobile phone and related security personnel so that immediate action can be taken. Integrating this system in parallel computing along with global positioning systems enhance the quality of the security cameras. When it is manufactured and sold on a large scale. Highest security can be adopted from a remote zone where human can't employed round the clock.

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