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ROOM SURVIELLANCE USING KEY FRAME EXTRACTION TECHNIQUE

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ABSTRACT -In this paper, an algorithm on Key frame extraction is proposed for improving the video surveillance. In the evolving research field of content-based video copy detection, proficient representation of video content at key frame level is decisive, due to the fact that similarity search is mainly achieved between content-representative frames. In this paper a successive search algorithm that avoids the process of temporal video segmentation is proposed for key frame extraction in MPEG videos. We aim at providing an efficient, real-time and completely automatic way of extracting key frames in videos, where not only the protracted task of offline video database indexing is avoided, but also query video processing is performed in the same manner as the reference video database. Substantial fall in computational cost is achieved by developing DCT coefficients in feature extraction.
KEYWORDS: Key frame extraction, surveillance, intrusion detection, RF Module

I. INTRODUCTION

Surveillance is one of the important issue highlighted the vital need for resourceful surveillance. Contemporary surveillance system use digital video recording (DVR) cameras which play host to multiple channels. The major drawback with this model is that it requires constant manual observing which is infeasible because factors like human fatigue and cost of manual labour. Moreover, it is practically impossible to search through recordings for important events in the past since that would require a playback of the entire video footage. Hence, there is indeed a need for an automated system for video surveillance which can detect unusual on its own. Our project would provide the security in sensational area except continuous supervising by human and it also provides the playback in the form of key frame which involves the summary of the video.

Video surveillance has gained importance in security, law enforcement and military applications and so is an important vision problem. As more and more surveillance cameras are developed in a facility or area, the demand for automatic methods for video processing is swelling.

The operator constantly watching the video footages could miss a potential abnormal event (e.g. bag being abandoned by a person). Most often he has to watch the entire video footage offline, to find the person who abandoned the bag. Here, this system would support a human operator by automatically detecting and drawing the operator's attentio

II. OBJECTIVES

The main aim is to provide the security to the confidential and extraordinary area. The objective is to detect the unofficial intrusion and inform to the respective administrator and to achieve this we are using different object detection techniques and algorithms. Whenever any unauthorized object will detect in the area then it immediately starts storing key frames applying key frame extraction algorithm also to maintain summary in the form of images and simultaneously it will alert through generating alarm (buzzer).

III. SYSTEM REQUIREMENT

Software Requirement
Matlab 2010(7.10) or next

Hardware Requirements
Camera(min 8 MP)
RAM :1 GB or more
Processor :Intel Pentium Core i3 or next\
Disk Space :4 GB or more
Alarm Device(buzzer)
RF

IV. SYSTEM MODEL (BLOCK DIAGRAM)

MAIN UNIT

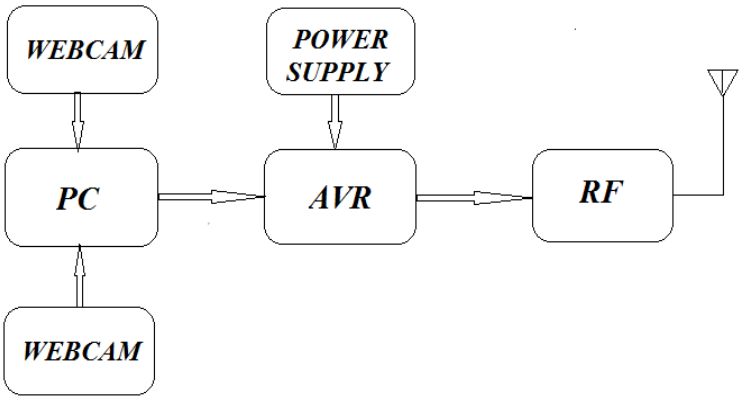

Fig 4.1 Block diagram Fig 4.1 Block diagram

BASE STATION

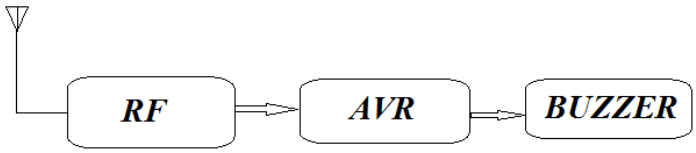

Fig 4.1 Block diagram

HARDWARE DESCRIPTION

Here in this system, we detect the motion in our desired confidential area.
Web camera placed in the desired area captures the video and that video is converted to frames.
The background image is captured and is set as the reference image for detecting motion.
The web camera captures the video and sends it to PC for further processing.
MATLAB takes the next frame and subtracts the currently taken frame from the reference frame.
The result is sent to the base station through RF communication.
In the base station buzzer indicates whether motion is detected or not.

At the same time MATLAB sets the current frame as the reference frame and the next frame is taken.

BACKGROUND SUBTRACTION

For any kind of computer vision processing it is important (and is often the first step) to separate out objects from the image that we are viewing. This process is called background subtraction.

More formally, it is the process of removal of static back ground features from an image. The Features of an image which are not part of the background are called the foreground objects.

For Example, if we have a camera fixed at a traffic light the vehicles will serve as foreground objects and features like zebra-crossing, lamp post etc will serve as background features. Consider for example the following original image frame and the corresponding foreground frame obtained after background subtraction. On left is the original frame. On Right is the foreground frame obtained after background subtraction.

VIDEO FRAME

A video or movie frame is a single picture or still shot, that is shown as part of a larger video or movie. Many single pictures are run in succession to produce what appears to be a seamless piece of film or videotape. Each frame can be selected on its own to print out a single photograph.

KEY FRAME EXTRACTION

Key frame extraction is the extracting an images/key frames from the video. Video segmentation has been an important and challenging issue for many video applications.

Usually there are two different video segmentation approaches i.e. shot-based segmentation that uses a set of key-frames to represent a video shot and object-based segmentation that partitions a video shot into objects and background.

A key frame extraction technique based on the intuition that the higher the motion the more the key frames required for summarization.

PHASES OF PROJECT

Following are the phases of the project:

1. **Video Capture:** Video is captured by the camera.
2. **Intrusion detection:** when Intrusion is detected then video is stored in the database.
3. **Security alert:** It include alarm alert after the detection of intrusion.
4. **Key frame extraction:** Key frame extraction is applied on the stored video and new file is stored.

Figure 6.2: Phases of Project

ALGORITHM

1. Start

2. Capture a video through webcam
3. Frame extraction is done
4. First frame is set as a reference frame
5. Next frame is subtracted from the reference frame
6. If subtraction is zero then there is no motion detected
   And if subtraction is non-zero then motion is detected
7. Motion detection will cause the ringing of buzzer
8. Stop

FLOWCHART

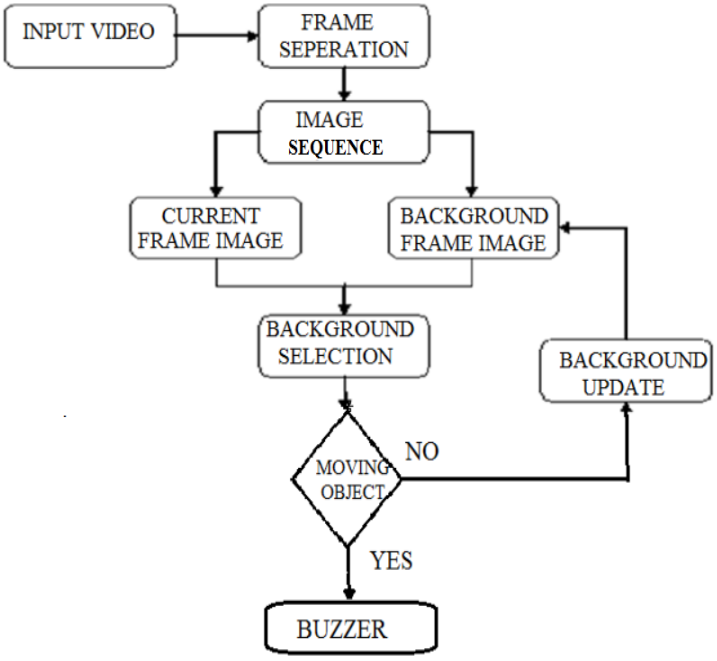

Fig 7.1: Flowchart

V. RESULTS

When any object or instruction is detected within a fraction of second application starts storing key frames (images) and also generates buzzer for 10 sec.

ADVANTAGES:

This method initializes and updates the background in real time.
Provides high robustness.

DISADVANTAGES:

Shape detection is not possible.

APPLICATION

Video Surveillance
Weapon Storage Area
Atomic Research Area
Botanical laboratories

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