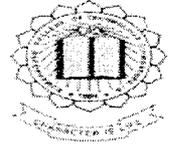


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# ACTIVE VIDEO BASED SURVIELLANCE SYSTEM

A PROJECT REPORT

*Submitted by*



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*In partial fulfilment for the award of the degree*

*Of*

**BACHELOR OF ENGINEERING**

*In*

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**KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE**

**ANNA UNIVERSITY: CHENNAI-600 025**

APRIL 2009

**BONAFIDE CERTIFICATE**

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# BONAFIDE CERTIFICATE

Certified that this project report entitled “ACTIVE VIDEO BASED SURVIELLANCE SYSTEM” is the bonafide work of , v.sreedhar and c.r balaji who carried out the research under my supervision. Certified also, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.



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INTERNAL EXAMINER



EXTERNAL EXAMINER

## DECLARATION

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# DECLARATION

We hereby declare that the project entitled ” **ACTIVE VIDEO BASED SURVIELLANCE SYSTEM** ” is a record of original work done by us and to the best of our knowledge, a similar work has not been submitted to Anna University or any Institutions, for fulfillment of the requirement of the course study. The report is submitted in partial fulfillment of the requirement for the award of the Degree of Bachelor of Computer Science and Engineering of Anna University, Chennai.

Place: Coimbatore

Date : 28 : 04 : 2009

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**ABSTRACT**

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## ABSTRACT

Modern video-based surveillance systems employ real-time image analysis techniques for efficient image transmission, color image analysis, event based attention focusing, and model-based sequence understanding. Mounting video cameras is cheap, but finding available human resources to observe the output is expensive. Although surveillance cameras are already prevalent in banks, stores, and parking lots, video data currently is used only “after the fact” as a forensic tool, thus losing its primary benefit as an active, real-time medium. The proposed approach is very efficient both in terms of computational and space criteria.

The system must be able to track objects moving in its field of view, classify these objects and detect some of their activities. Tracked events should be classified and their dynamics (sometimes called behavior) analyzed to alert an operator or authority of a potential danger. For security awareness based on multiscale spatio-temporal tracking. The System describes the low-level image and video processing techniques needed to implement a modern visual-based surveillance system. A visual-surveillance system is comprised of a network of sensors (typically conventional closed circuit (CCTV) cameras), some with overlapping fields of view, providing continuous (24/7) online operations.

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## LIST OF FIGURES :

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## **LIST OF ABBREVIATION**

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## **LIST OF ABBREVIATIONS :**

**CCTV** : Closed Circuit Television

**VCA** : Video Content Analysis

**GUI** : Graphical User Interface

**IDE** : Integrated Development Environment

**DLT** : Direct Linear Transform

**ROC** : Receiver Operation Characteristics

**BSG** : Background Subtraction

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## **INTRODUCTION**

# INTRODUCTION

Automatic detection and recognition of objects is of prime importance for security systems and video surveillance applications. Automated video surveillance addresses real time observation of people and vehicles within a busy environment. Outdoor surveillance systems must be able to detect and track objects moving in its field of view, classify these objects and detect some of their activities.

The process of extracting and tracking of human figures in image sequences is a key issue for video surveillance and video-indexing applications. The need for automated person identification systems strongly motivates this interest.

The process can be broken down into the following steps: detection , tracking, classification , and identification of human movement or gait. There are several approaches for each of these subproblems. A useful and popular approach is based on silhouette analysis with spatiotemporal representation, where the goal is to achieve an invariant representation of the detected object.

## **1.1 Objective and scope:**

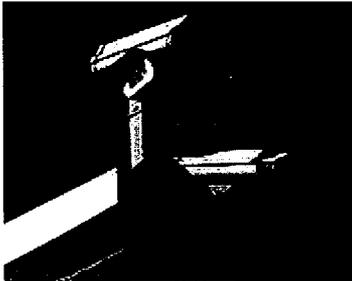
The project work is to develop a software to make a alertness for the security providers and decision makers. In this, Static cameras are employed to tune camera parameters (for instance, to adapt to weather or illumination conditions) or to track events of interest such as Camera calibration with respect to an extrinsic Cartesian reference frame, Scene acquisition, Adaptive modeling of background, change detection for foreground regions.

The active video based surveillance system is organized as four stages. The implementation of the active video based surveillance system is done using the `c#` (c sharp) language. The reason for choosing this platform of programming language is its robust, durable, simple, safe and straight forward. The language provides a short learning curve, increased productivity, and efficient.

## 1.2 About Surveillance :

**Surveillance** is the monitoring of the behavior of a person or group of people, often in a surreptitious manner. Although the word surveillance in **French** literally means "watching over" the term is often used for all forms of observation or monitoring, not just visual observation. The word **surveillance** is commonly used to describe 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). However, surveillance can also refer to simple, relatively no- or low-technology methods such as human intelligence agents and postal interception.

## 1.3 Introduction to CCTV :



CCTV is a collection of video cameras used for video surveillance. **Closed-circuit television (CCTV)** is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors.

It differs from broadcast television in that the signal is not openly transmitted, though it may employ point to point wireless links. CCTV is often used for surveillance in areas that may need monitoring such as banks, casinos, airports, military installations, and convenience stores. In industrial plants, CCTV equipment may be used to observe parts of a process from a central control room; when, for example, the environment is not suitable for humans.

CCTV systems may operate continuously or only as required to monitor a particular event.

## **Closed Circuit Television (CCTV)**

CCTV is different from broadcast television as all the equipment is directly connected together with cables or wireless transmitters that can not be received by standard television aerials or equipment. The transmissions of the video signals are only intended to be accessible by the equipment on its dedicated closed circuit.

CCTV is generally used in areas where there is an increased need for security, such as banks, airports and town centres. CCTV was initially developed as a means to increase security for banks but over time it has developed into a cost effective means of general surveillance and home security.

A basic CCTV system comprises of the following;

- Camera, lens and power supply.
- Recording device, VCR or a digital video recorder.
- A monitor

## 1.4 Computerised Monitoring :



Fig .1 Surveillance camera :

The first CCTV cameras used in public spaces were crude, conspicuous, low definition black and white systems without the ability to zoom or pan. Modern CCTV cameras use small high definition colour cameras that can not only focus to resolve minute detail, but by linking the control of the cameras to a computer, objects can be tracked semi-automatically.

The technology that enable this is often referred to as VCA (Video Content Analysis), and is currently being developed by a large number of technological companies around the world. The current technology enable the systems to recognize if a moving object is a walking person, a crawling person or a vehicle. It can also determine the color of the object.

## **1.5 Retention, Storage and Preservation :**

The long-term storage and archiving of CCTV recordings is an issue of concern in the implementation of a CCTV system. Re-usable media such as tape may be cycled through the recording process at regular intervals. There are statutory limits on retention of data.

Recordings are kept for several purposes. Firstly, the primary purpose for which they were created (e.g. to monitor a facility). Secondly, they need to be preserved for a reasonable amount of time to recover any evidence of other important activity they might document (e.g. a group of people passing a facility the night a crime was committed). Finally, the recordings may be evaluated for historical, research or other long-term information of value they may contain .

Recordings are more commonly stored using hard disk drives in lieu of video cassette recorders. The quality of digital recordings are subject to compression ratios, images stored per second, image size and duration of image retention before being overwritten. Different vendors of digital video recorders use different compression standards and varying compression ratios.

## **DEFINITION OF THE PROBLEM**

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# DEFINITION OF THE PROBLEM

## 2.1 Existing System:

- The switch based electrical Alarms.
  
- Buzzer Systems
  
- IR (Infra Red) Receiver transmitter Alarms
  
- Live video Display screen Watching and recording
  
- Manual System with humans and dogs
  
- Mirror reflectors
  
- Sensor alarming

## 2.2 Demerits Of Existing System :

- The switch based electrical Alarms are triggered only when it is pressed by someone.
- The buzzers reflect the same process of the on/off electrical alarming.
- IR (Infra Red) Receiver transmitter Alarms includes the transmission of rays from the source to destination and alerts are made when any disturbance or delay of transmissions.
- The spy cameras are used in Live video Display screen monitoring; those never remind the viewer about the present happening.
- Manual System with humans and dogs for watching and securing.
- Mirror reflectors are the traditional method of surveillance followed in BC's for visualizing the live videos.
- Sensor alarming is the recent technology followed for surveillance system in transmitting and receiving the signals which may lead to the trouble in the loss or delay of signals.

## 2.3 Available Solution :

Due to the above stated reasons and since there isn't any existing systems, a new system has to be built that will overcome these difficulties. This system is being developed as a web portal with the help of Java.

## 2.4 Advantages :

- User Friendly GUI
- Fast storage and retrieval of requested data
- Reduce the manual work to a minimum
- Ensure security
- Generate reports easily
- Reduce the paper trail
- Ensuring access of data only to authorized users.



## **2.5 Proposed system :**

The importance of video surveillance techniques has increased considerably since the latest terrorist incidents. Safety and security have become critical in many public areas, and there is a specific need to enable human operators to remotely monitor activity across large environments. Transport systems (railway transportation, airports, urban and motorway road networks, and maritime transportation), banks, shopping malls, car parks, and public buildings, industrial environments, government establishments (military bases, prisons, strategic infrastructures, radar centers, and hospitals).

## **2.6 Requirement Analysis :**

The overall requirements of the product are stated :

- Information and Control Needs
- Product Function and Behavior
- Overall Product Performance
- Design and Interfacing Constraints
- Easy search of Information and records
- Information can be viewed online by the authorized person
- All the stations are interconnected

Video surveillance can be an effective tool for today's businesses—large and small—in security surveillance, production monitoring, and deterring predatory and purloining. Behaviors. Since the introduction of analog video surveillance systems back in the 1970s, tremendous strides have been made in sensing, storage, networking, and communication technologies. The consequence is that, instead of employing video surveillance mainly as an “after-effect” forensic tool, it is now feasible to deploy digital, network-based surveillance systems to provide interactive, real-time monitoring and surveillance. This research proposes a software framework for video analysis to enable robust and real-time human activity detection and recognition.

A visual surveillance system is comprised of a network of sensors (conventional closed circuit (CCTV) cameras, some with overlapping fields of view, providing continuous (24/7) online operations. Each visual surveillance network has its own specific architecture. For fixed cameras, the architecture is data driven and its data to information flow is bottom-up. As mobile cameras are employed in more sophisticated networks, one might envisage a number of feedback controls to tune camera parameters (for instance, to adapt to weather or illumination conditions) or to track events of interest.

1. Camera calibration with respect to an extrinsic Cartesian reference frame
2. Scene acquisition
3. Adaptive modeling of background
4. Change detection for foreground regions

All of the steps are intertwined: camera calibration and registration can be learned from observation data, and the processes used to achieve this automatically require basic image processing, such as the modeling of background views and the detection of foreground events.

The input for the system is a sequence of digital images acquired by a number of cameras installed along speedways, in tunnels, at crossroad, and so on. The global architecture of the application can be decomposed into three main parts:

1. Segmentation of the input images, extracting video objects from the scene;
2. Description of the video objects, delivering compact and high level descriptors that ease their manipulation;
3. Reasoning based on the descriptors received.

This step generates statistics, classifications, alarms, etc., and provides the user with images. The engine of this reasoning is made of Intelligent Agents.

Advanced video surveillance technologies and systems are pursued for varied security, law enforcement, and military applications, in addition to

civilian environment monitoring, health care, wildlife preserve management, traffic measurement, and catastrophe response management.

In complex environments, it is often impossible for a single sensor to maintain its view of an entire scene since occlusions are common and the sensor has a limited field of regard. To provide an accurate and comprehensive picture of wide area scenarios, a promising solution is to use a large, distributed multi-sensor network to cooperatively interpret the entire scene.

## **2.7 Product Perspective :**

- All the details have to be stored in a secured database and maintained properly.
- Very friendly GUI design for user interaction

## **2.8 User Perspective :**

In general the user should have a basic knowledge and understanding of the computers, but in this project all the modules are understandable by a normal user also. So there is no issue on working knowledge.

## **REQUIREMENTS**

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# REQUIREMENTS

## 3.1 External Interface Requirements :

The user interface should be as per GUI standards. The features and the functionality of Java should be exploited to provide a user friendly GUI. The following requirements should be taken care during GUI design. Command buttons are also used when a choice has to be made for display of specific module data.

Important messages such as errors have to be shown as message boxes or in an appropriate way and until the mistake has been rectified we must not proceed further. The validation strategy must be implemented. All functional features indicated in this document should be provided.

## 3.2 Functional Requirements

Functionally system is required to perform the following

- The system must be easily configurable
- The system must have user-friendly interface so that data can be managed with minimum user interaction
- The system must provide adequate security features to secure data from unauthorized usage
- Performance requirements
- Security
- The system is protected from unauthorized access through the implementation of standard login procedure

### 3.3 Design Constraints

- ☞ Keyboard and mouse can be interoperable
- ☞ Errors and warnings have to be shown as message boxes or in any appropriate way possible
- ☞ Validation whenever applicable based on the database
- ☞ Must be standard

## **ANALYSIS AND DESIGN**

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# ANALYSIS AND DESIGN

## 4.1 Analysis

Analysis comprises the initial phase of the software life cycle that attempts to understand and model customer needs and constraints. In this phase, the software development process, the software's overall structure and its nuances are defined. In terms of the client/server technology, the number of tiers needed for the package architecture, the database design, the data structure design etc is all defined in this phase. A software development model is created. Analysis is a very crucial in the whole development cycle. Any glitch in the design phase could be very expensive to solve in the later stage of the software development. Much care is taken during this phase. The logical system of the product is developed in this phase.

## 4.2 Design

Good design is the key to effective engineering. However it is not possible to formalize the design process in any engineering discipline. Design is a creative process requiring insight and flair on part of the designer. It must be practiced and learnt by experience and study of existing systems.

### 4.3 Design stages:

1. Study and understand the problem- Without this understanding, effective software design is impossible. The problem should be examined from a number of different angles or viewpoints as these provide different and invaluable insights into the design requirements.
2. Identify gross features of at least one possible solution. It is often useful to identify a number of solutions and to evaluate all of them. The choice of the solution often depends on the designers experience, the availability of reusable components and the simplicity of the derived solutions, as they i.e. designers are better aware of the advantage and disadvantages.
3. Describe each abstraction used in the solution before creating formal documentation, the designer may write an informal design description. This may be analyzed by developing in detail. Errors and omissions in the high level design if any are corrected. This problem solving process is repeated for each abstraction identifies in the initial design. The refinement process continues until a design specification of each abstraction can be prepared.

# TECHNICAL REQUIREMENT

## 4.4 Hardware :

1. Processor Type : pentium III
2. Processor Speed : 2.00 MHZ
3. RAM : 64 MB RAM
4. Hard Disk Capacity : 20 GB
5. CD-ROM Drive : Acer 50x
6. Floppy Drive : 1.44 MB
7. Monitor : Acer
8. Mouse : Logitech
9. Keyboard : VS keyboard

## 4.5 Software:

- Operating System : Windows 2000 ,xp,2003,vista
- Language : Visual C# .NET 1.1

## **4.6 Software specification :**

### **i) About C# .NET**

C#.NET provides the easiest, most productive language and tool for rapidly building Windows and Web applications. C#.NET comes with enhanced visual designers, increased application performance, and a powerful integrated development environment (IDE). It also supports creation of applications for wireless, Internet-enabled hand-held devices. The following are the features of C#.NET with .NET Framework 1.0.

### **ii) Direct Access to the Platform**

C# developers can have full access to the capabilities available in .NET Framework 1.1. Developers can easily program system services including the event log, performance counters and file system. The new Windows Service project template enables to build real Microsoft Windows NT Services. Programming against Windows Services and creating new Windows Services is not available in C#.NET Standard, it requires Visual Studio 2003 Professional, or higher.

## **SYSTEM IMPLEMENTATION**

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# SYSTEM INPLEMENTATION

## 5.1 System design:

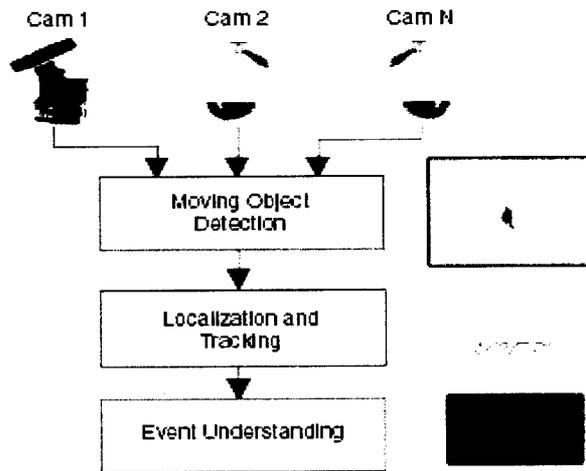


Fig .2 sysyem desing

## 5.2 Video Surviellance System :

Computing and sensing technologies enable multimodal and distributed video sensors and networks to be deployed in commercial or military establishments. However, new problems arise from the wide spread use and proliferation of such sensor resources. Most significant is the human ability (or lack thereof) to successfully fuse and comprehend the information that these sensors can provide.

## **MODULE DISCRIPTION**

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# Module Description

## 6.1 Moving Object Recognition :

Acquisition of pose parameters of moving objects is an important problem in many fields. This paper proposed a method to obtain pose parameters of moving object (mainly aircraft) from image sequence under assumptions of monocular and perspective view as well as known 3D shape and initial pose parameters of objects. Firstly image sequence is captured by optical-electric phototheodolite. Based on these images, a method for aircraft pose measurement from image sequence has been deeply studied from the view of photogrammetry and projective geometry. A novel idea, Parapoint Feedback Iteration, has been presented and used in aircraft pose measurement.

To solve the nonlinear equations, at first several frames several control points must be selected manually and a DLT (Direct Linear Transform) algorithm has been used to provide approximate value, in the following frames Kalman filter can be used to predict motion parameter of next frame as approximate value. To get the accurate parameters, Parapoint Feedback Iteration algorithm has been used. Several sets of data have been used to test the method and results show its reliability and robustness.

## **6.2 Viewpoint Integration :**

Before we can jointly track objects between each camera view it is necessary to recover some calibration information. We assume that the camera views are widely separated and moving objects are constrained to move along a dominant ground plane. Using an LMS search it is possible to robustly recover a set of correspondence points, which can be used to compute the homography mapping between each overlapping camera view. The LMS method performs an iterative search of a solution space by selecting a minimal set of correspondence points to compute the homography mapping. The solution that is most consistent with the object track data is taken as the best solution.

## **6.3 Camera Calibration and Measurement Uncertainty :**

Each camera in the surveillance network was calibrated using a set of landmark points. The accuracy of the calibration is normally sufficient for extracting 3D Measurements and tracking objects as long as the survey points are sensibly distributed on the ground plane. A survey of a typical surveillance region can be performed in less than one hour.

### **6.3 a) Steps In Moving Object Recognition :**

The moving object recognition includes two basic stages to perform the object recognition. The stages were

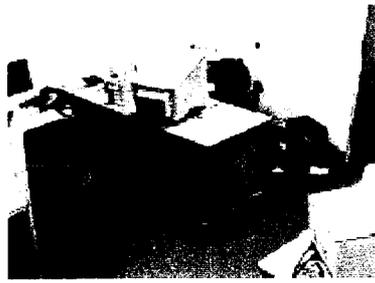
- Device capturing
- Background subtraction

## **6.4 Device Capturing:**

Camera that can be captured the events and store in user specified path .

## **6.5 Background Subtraction :**

A performance evaluation methodology called Perturbation Detection Rate (PDR) analysis is introduced for measuring performance of background subtraction (BGS) algorithms. It has some advantages over the commonly used Receiver Operation Characteristics (ROC) analysis. Specifically, it does not require foreground targets or knowledge of foreground distributions. It measures the sensitivity of a BGS algorithm in detecting low contrast targets against background as a function of contrast, also depending on how well the model captures mixed (moving) background events.



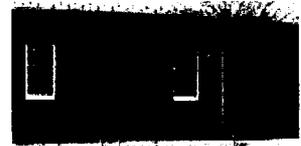
**(a) Indoor Office**



**(b) Outdoor Woods**



**(c) Red-Brick Wall**



stationary  
background

moving  
background

**(d) Parking Lot**

**Fig .3 Background subtraction**

### **The sample empty-frames of the videos used for the experiments**

The capability of extracting moving objects from a video sequence captured using a static camera is a typical first step in visual surveillance. A common approach for discriminating moving objects from the background scene is detection by background subtraction.

The idea of background subtraction is to subtract or difference the current image from a reference background model. The subtraction leaves only non-stationary or new objects.

## 6.6 Codebook-based Background Subtraction :

The codebook BGS algorithm adopts a quantization/clustering technique, motivated by Kohonen , to construct a background model from long observation sequences. For each pixel, it builds a codebook consisting of one or more codewords. Samples at each pixel are clustered into the set of codewords based on a color distortion metric together with a brightness ratio. Not all pixels have the same number of codewords. The clusters represented by codewords do not necessarily correspond to single Gaussian or other parametric distribution. Even if the distribution at a pixel were a single normal, there could be several codewords for that pixel. The background is encoded on a pixel by pixel basis. Thus a pixel is represented by a codebook which consists of one or multiple codewords.

Detection involves testing the difference of the current image from the background model with respect to color and brightness differences. Unlike MOG or the kernel methods, the codebook method does not involve floating point calculation of probabilities which can be costly. Indeed, the probability estimate is dominated by the nearby training samples. The CB method simply computes the distance of the sample from the nearest rescaled cluster mean. This is very fast and shows little difference in detection compared with the probability estimate. If an incoming pixel meets two conditions, it is classified as background

(1) The color distortion to some codeword is less than the detection threshold, and

(2) its brightness lies within the brightness range of that codeword. Otherwise, it is classified as foreground.

To cope with the problem of illumination changes such as shading and highlights, the CB method does not use RGB values directly. Brightness is often the largest source of variation, not intrinsic color. Physically these are different as well. The CB method calculates a brightness difference (a ratio of RGB absolute values) and a color difference which rescales codeword RGB values to the brightness of the current, tested pixel.

## **6.7 Video Buffering And Invoking :**

Video buffering and invoking presents a security video surveillance system with motion detection capability that allows the supervisor of a security monitoring system not to pay attention to it constantly. In current days, when a security camera is installed, a human being has to be on alert all the time while the camera is on since any little movement can require attention of the supervisor. But most of small objects do not need the supervisor's attention since they could be small animals. In this new system the system only reports the unusual change to the supervisor by calculating the motion and size of objects in the screen. Thus the supervisor can be liberated from the 24-hour concentration duty; instead he/she can be only alerted when the real security threat such as a big moving object like a human intruder appears. The utility of the system is proved theoretically.

## **6.7 a) Steps In Video Buffering And Invoking :**

In order to find the changes in a moving object and also for invoking there were certain steps to be followed.

- Change Detection and Feature Extraction
- Alert Generation

## **IMPLEMENTATION OF CHANGE DETECTION AND FEATURE EXTRACTION**

---

# **Implementation of change detecton and feature extraction**

## **7.1 Introduction To Motion Detection :**

Motion detection is one of the most important and interesting issues in the area of image processing. In general, the motion detection is realized through the two fundamentally different approaches: recognition based detection and motion based detection. In the first approach, a moving object is recognized in successive images.

The position of the moving object and its moving direction can be obtained by comparing its current position with the last one. But in this method, there are some problems.

For example, only a recognizable object can be detected and the pattern recognition requires a high-level processing that is expensive.

Examples of recognition based motion detection can be found in the second approach relies entirely on moving aspects of object to detect its movement. In this method, there is the advantage of being able to detect any moving object regardless of its size or shape. One of the methods of motion detection based on the second approach is a temporal derivative technique.

## **7.2 Necessity Of Motion Detection :**

In the conventional security system, one or more cameras are connected to a local or remote controller. And the controller is supervised by one or many human beings. The supervisor has to watch continuously the monitor that is connected to the cameras to detect the movement or obtain certain information.

In general, the important information that should be obtained is the change of the images. With this information, the supervisor should decide whether he/she has to react to it or not. And in order to avoid the situation that the supervisor would not detect anything even if something happened in the screen, we have to register the images continuously. In this case, the volume of images that should be registered is not negligible. And to find the information from the registered images, we have to replay all the registered images. For certain security system, we utilize the ultra-red sensor to detect the presence of human beings in a certain area.

But in the ultra-red sensor-based security video surveillance system, we can not distinguish the human beings with small animals like the dog, the cat, and the bird etc.. The problem of these systems is that any action that requires intelligence depends on the human beings. To detect and to decide if there happened a non-trivial problem or not the human being is indispensable. But the human being can also make a mistake or miss certain information. If we have some devices where the movement is detected, the size of moving object is calculated, and lastly the decision on whether the image containing a certain moving object is worthy of human attention should be registered or not is made automatically, we can solve the problems that are mentioned above.

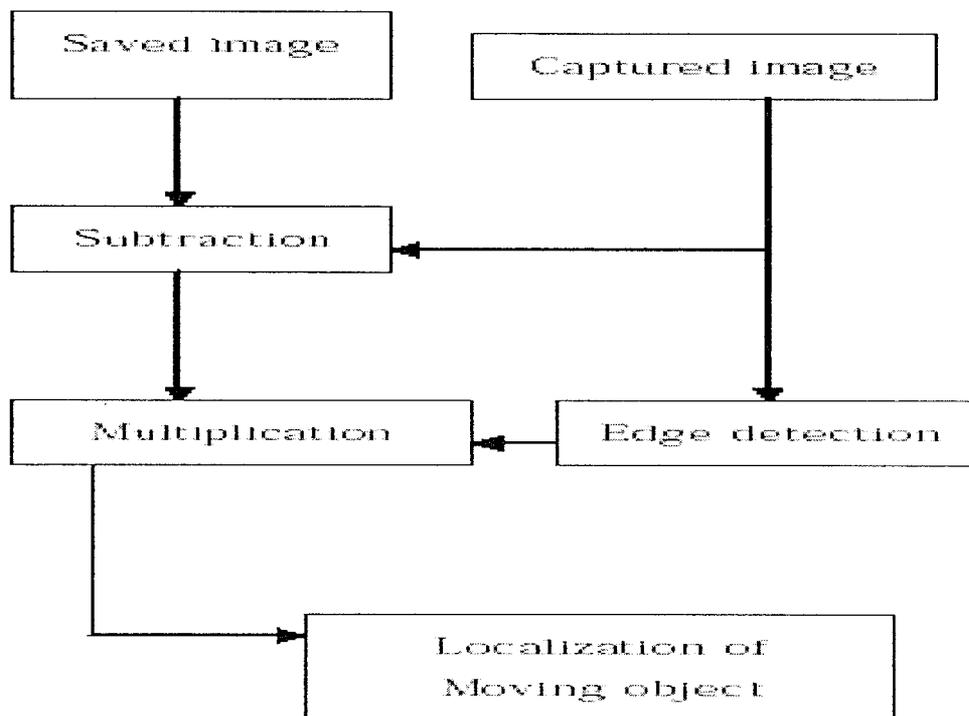
Since it instills the intelligence that is necessary for a security system, the computer is a very useful device. Our new system utilizes a computer-based image processing device which is called motion detection. The new security

video surveillance system with motion detection capability was constructed. In this new system, we can capture a image periodically with a predefined time interval and compare this image with a pre-captured image to detect a movement and to calculate the size of moving object through the image processing technique. And the result of processing can be saved locally or can be transferred to a different PC through a LAN or public network.

### 7.3 Implementation Of Motion Detection

In this a motion detection system is implemented based on the temporal derivative technique over PC with a CCD camera and an image capture board PC Camera The general inner-configuration of the motion detection system is found in the Figure .

In this detention system, we can filter out the moving object, and can calculate the size of moving object in pixels and localize its center.



## **7.4 General Inner-Configuration of the Motion Detection System :**

In the security video surveillance system with motion detection capability, we can find a saved image and a captured image. In the captured image, there can be a moving object. The result of image processing to determine the nature of the moving object, subtraction, edge detection, and multiplication are used. For this system, we have to consider the noise of an image. In this implementation, the user can configure the threshold value of minimum movement. If the detected movement is smaller than the threshold value, the system considers that the noise in an image makes a movement, so the movement is negligible. Through these steps, we can minimize the effect of noise.

In this system, the user can also define the minimum size of the moving object which triggers a reaction of the user. That is, if the size of moving object is smaller than the value which is chosen by user the system does not report any information to the user. In other words, if a movement of significance is detected, the system will save the result of processing and the image which has the moving object.

The saved information can be located locally or remotely. If the PC on which the movement detection system is installed is connected to a computer network, the user can choose one or more sites in which the information and the images can be saved. In this system, the user can also define compression option of the image that should be saved locally or remotely. Once a compression option is set, the image is compressed with JPEG.

As a consequence, we can minimize the required space to save the images and we can also reduce the transfer time. Another characteristic of this system is that all the options and values can be configured both locally and remotely. This security video surveillance system is composed of a movement detection system, a local server or a remote server which can configure the movement detection system, and the information transfer system.

Through this system, the supervisor of the system can control many security systems that are connected locally or remotely without the full time concentration on a monitor and this system can be run without close monitoring since whenever any non-trivial sized object appears, the system itself would alarm the supervisor automatically.

### 7.5 Motion detection images:

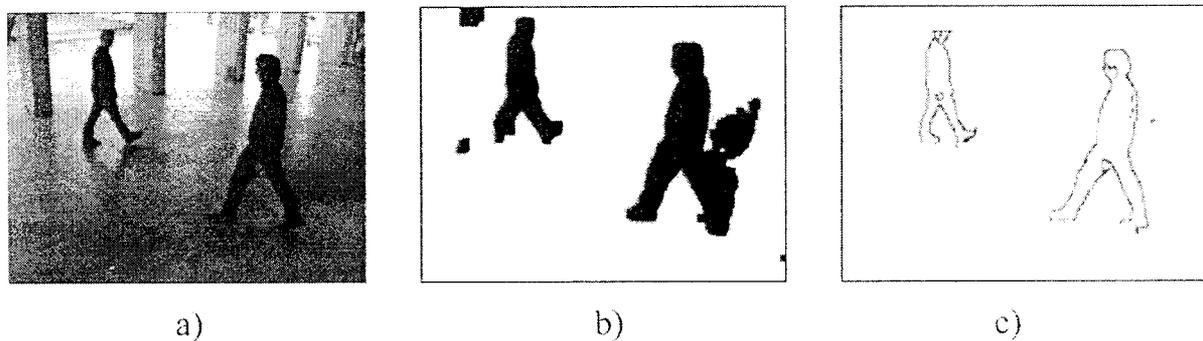


Fig .4 Motion detection

### 7.6 Step by step detection :

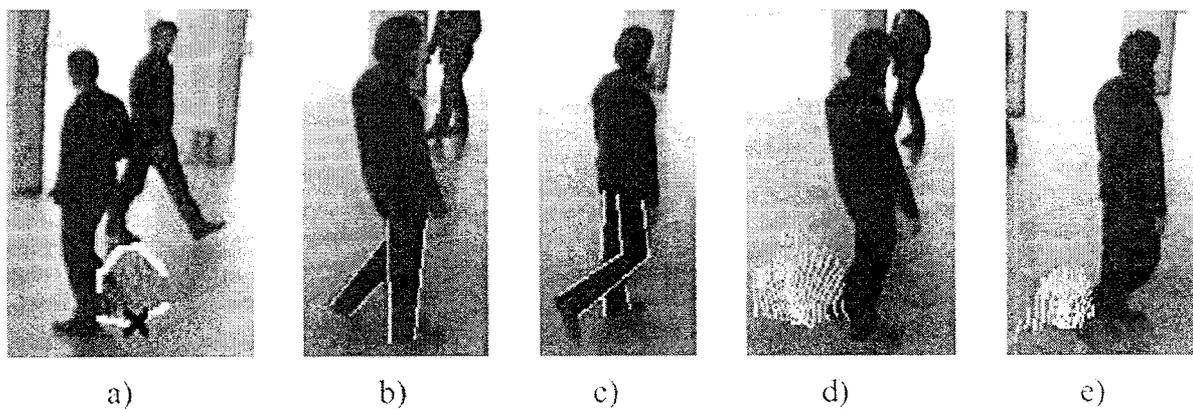
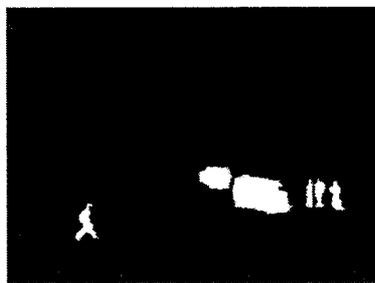


Fig.5 Step by step detection

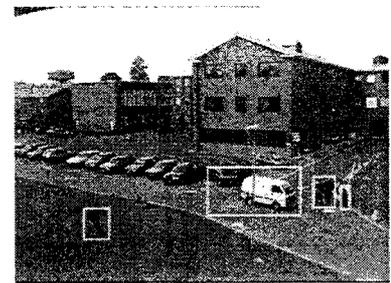
## 7.7 Outdoor camera images :



(a)



(b)



(c)

Fig.6 Outdoor camera images

(a) Input frame,

(b) segmented image by the user

(c) output

## 7.8 Continuous Changes Capturing :

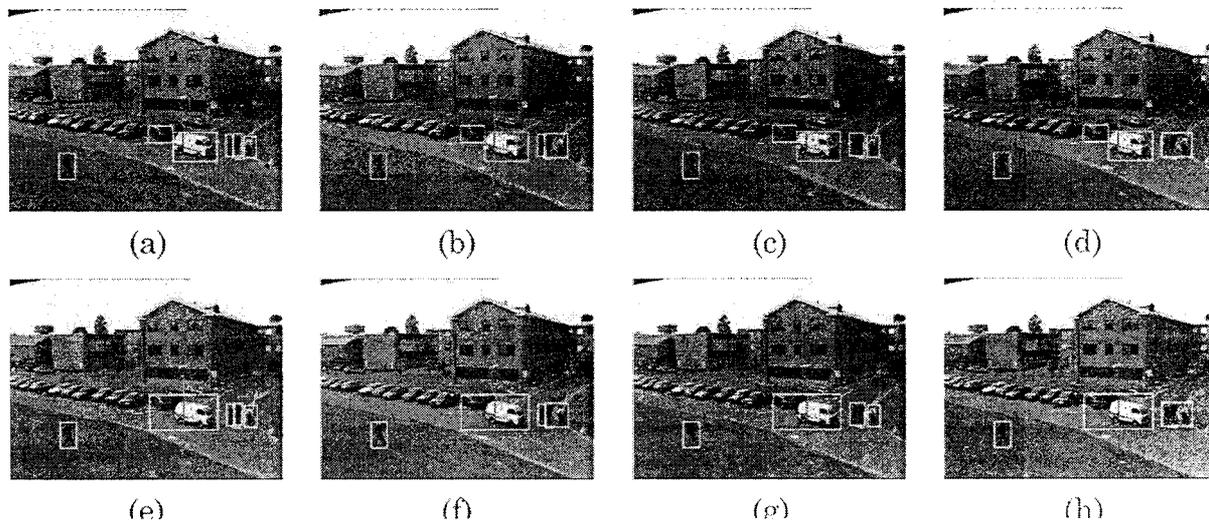


Fig.7 Continuous changes capturing

## CONCLUSION

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## CONCLUSION

we have introduced a robust pedestrian detection and gait feature extraction method. We are able to achieve a reliable detection rate using an invariant and effective data representation in the Eigenwalk space, based on spline interpolation and a dimension-reduction technique.

A novel method for leading-leg identification has been presented; this is a possible gait characteristic for walker registration between multiple cameras capturing different views of the same target. An important goal was to use this feature for the purpose of multiple-camera registration.

A camera-registration method has been presented which uses walk parameters as features to identify corresponding points. The features we used (concurrent walk steps, leading leg identity, and 2-D motion vector) seem potentially to provide good data for the estimation of homography between two different camera views of the same scene and an occurring configuration of nonoverlapping views. The registration method has been verified on an actual indoor camera surveillance system and was able to provide real-time feature (walk) detection. This efficient camera registration proves the accuracy of the localization of our gait features.

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## REFERENCES

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