VOTING BASED MOTION ESTIMATION FOR REAL TIME VIDEO TRANSMISSION

Prof. V.B. Raskar[1] , Kiran B. Patil[2], Snehal Y. Nikam[3], Ganesh A. Abnave[4]

Abstract— A dynamical and wider range of monitoring ,data transmission and video is achieved with the help of video-based surveillance system .This can be obtained from cooperative mobile cameras. This type of cameras are used to detect the object of interest which we want to detect. As it is very difficult task to accurately detect the moving object from image frame which is captured with the help of moving cameras. As the camera is move there causes the shifting of background which is being static and also the object which are being moved in the captured image frame . In order to correctly estimate the object which are moving in static background the voting based motion estimation algorithm is used to further process. To effectively decrease the transmission cost and bandwidth a content based motion estimation is used. This eventually contains a edge detection and content based sampling coding at temporal and spatial scales . As we are known about the knowledge of camera motion . this algorithm uses shifting information of static background to estimate the camera movement .

  This information which is being shifting is being determined based on voting decision based on interest. Then this estimated motion is used to compensate for visual content obtained from camera. This also used to improve the progressively image quality and transmission bandwidth is effectively increased .

Index Terms—Motion estimation , GUI

I. INTRODUCTION

The public safety and security is more important. for security of human life , video based surveillance plays a vital role . In video based Surveillance a camera is present /used. The camera use in the area to sense or monitor the targets and transmit video over the network . The network video system can be applied in industrial, commercial, transportation area. To obtain the accurate monitoring data we can use multiple camera or mobile camera. Then video-data for camera should be transmitted for further analyzing of information. Transmitting video over network is a difficult task because video data contain large amount of information. Transmission amount of video data exceeds available bandwidth. The excessive flow of data takes place and it may lead to packet loss and the performance of video transmission degrades .

The coding and compression of video are perform based on moving object. To have desirable

Performance , the detection of moving object must be accurate or perfect. Firstly perform the   detection from captured images. It perform by utilizing frame differencing.

The process consist of two parts motion estimation, motion compensation. In the paper , voting based motion estimation algorithm is proposed . this algorithm is used to estimate camera motion.
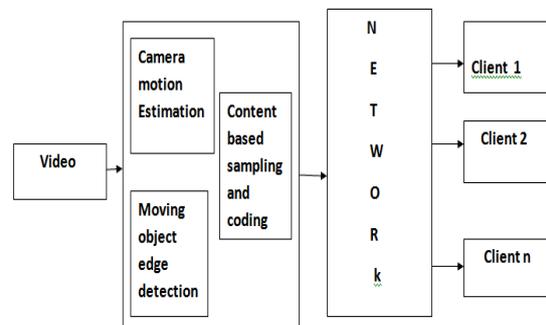

Fig :video transmission mechanism

Above Fig. shows the overall procedure for video transmission, including camera motion estimation, edge detection of moving objects, and content-based sampling and coding.

The remaining paper is organized as follows.
Section 2 Problem statement .
Section 3 Literature survey .
Section 4 describes the implementation detail of the voting-based motion estimation .
Section 5 presents the result of experimental tests.

II. PROBLEM STATEMENT

Our Aim in this Project is to:

- Difficult task to detect moving object from image frames captured by mobile cameras and data flow of surveillance video.
- As camera motion usually causes the shifting of static background as well as moving objects in the captured image frames.
- In order to correctly estimate the motion of moving objects.
- Effectively decrease encoding cost and bandwidth utilization.

3. LITERATURE SURVEY

Now a days we see that the deployment of sensor image compression techniques and the protocols of network for transmission of video is widely investigated. A method to transmit a video is to reduce the quality and complexity of the captured original video , but without ignoring the important content of the message. In order to achieve the successful transmission of data we need to reduce data quantity at spatial scale . Embedded coding algorithm are used for image compression by generating variable bit stream for progression transmission. Reducing the spatial scale will not be useful for high resolution video.

In this surveillance applications over video based network the object which are moving are considered most important objects . for stationary camera it is easy to estimate the moving objects which can be simply achieved by subtracting the background .while in moving cameras the background subtraction can be treated as moving objects and can generate wrong results . as the background is also moving the background model used to segment .the moving objects is not applicable for mobile camera scenario.

Therefore correct estimation of camera motion is very important in order to completely identify the moving objects in moving camera.

4. VOTING BASED MOTION ESTIMATION

In image processing field images are more important. Image features are important in tracking, detection. select proper image could increase the experimental accuracy. image features are differentiated in two groups, frequency features.

Texture is one of frequency features of smoothness . edge and color are examples of

amplitude features. From edge the object shape or size can be determined. The edge is usually used to detect the location of the moving objects or to estimate the motion of the mobile camera. The estimated motion is then used to compensate for the information of the moving objects. If information is correctly determine, motion estimation algorithm is used to represent the information of object with background information .Key processing units of the overall motion estimation and sampling at temporal and spatial scales are briefly described in Fig. , including camera motion estimation, moving objects edge detection, and content-based sampling and coding .voting based decision as well as standard canny detection . this two algorithm are been used in first two units. This algorithm are used to determine movement of camera when background edge is changing or stationary . this overall procedure is as shown in figure . as shown above I_n, I_{n-1}, S_n and V_{shift} are used to represent current frame , previous frame and motion compensated frame respectively.

This algorithm directly utilizes motion vector of edges of static background in order to estimate camera motion. It is very important to estimate the parameters of camera motion model. For example inclination and rotation angle.

Based on behavior of moving object allocated bandwidth of transmission network various sampling mechanism in temporal and spatial domain are implemented.

Temporal sampling depends on quality of moving objects. Spatial coding mechanism is used to progressively encode visual information of temporally chosen frame. The overall objective of this mechanism is to remove unwanted information from one frame and two efficiently give available network as well as bandwidth for transmitting most important part of image.

A: camera motion estimation :

In this topic concept and theory of voting mechanism for camera motion is discussed in detail. The algorithm is based on results of standard edge detection algorithm along with morphological operation . erosion and dilation . to estimate edges of moving static object as camera is moving static objects as well as background seems moving object in capture images. Hence there is need to subtract consecutive frame that will give edge information of moving and static object. In order to determine visual information of moving object camera motion should be first estimated. an estimated motion should be compensated for edge detection . after that morphological operation are applied to enhance edge detection of moving object to subtract background object . the overall scenario is discussed in fig given below.
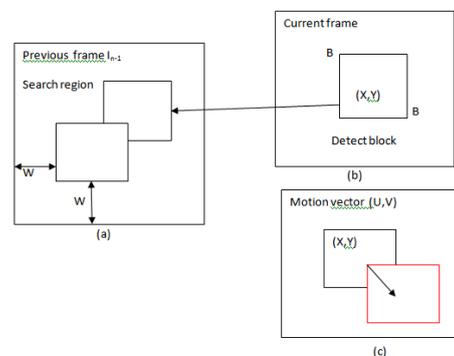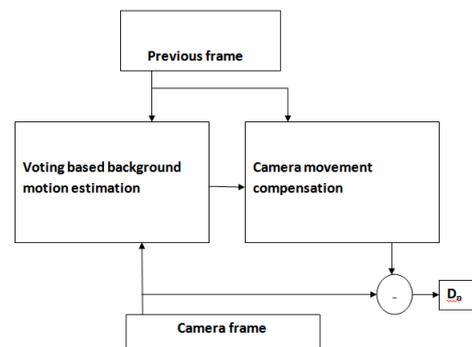

Fig: (a) previous frame and search region , (b) current frame and detect block, (C) motion vector

Algorithm :

The voting based motion estimation algorithm is given below.

1. Video Acquisition.
2. local motion vector .
3. moving object detection .
4. compensation of local camera motion.
5. find speed of moving object in terms of frame/sec
6. calibration of speed from frame/sec to m/s
7. sending speed on serial port.
8. checks limit :-if limit crossed
      1.Gsm alert

2.buzzer on

3.display speed on lcd

9.Capture image and marking the vehicle.

### 5 RESULTS

a. Description of scenario 1:

In this scenario firstly MATLAB and video tool kit is used . here the moving camera which is moved in both direction is used. the is object is also moving . In this scenario we capture image and image acquisition is done . By taking snapshot capture path.

The capture image is shown below :
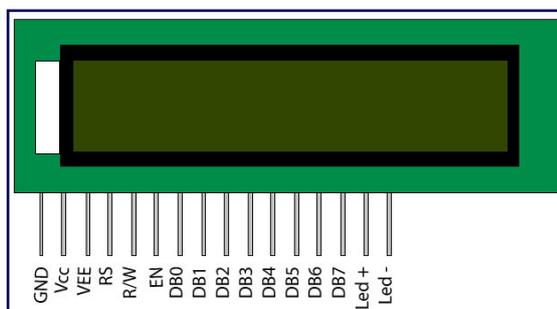

Fig : capture image

b. Description of Scenario 2:

From 1 st scenario we capture image . we shown this images in GUI . GUI stands for Graphic User Interface. Gui   gives   the   overview   of   images.
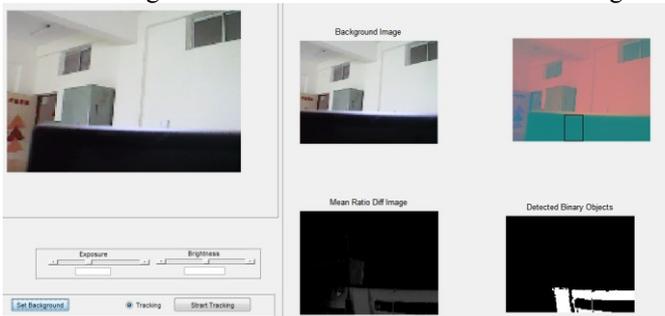
c. LCD output-

After image processing . the speed of moving object is displayed on LCD .

sFig.4 LCD output

6. CONCLUSION

To provide real-time transmission of video in the surveillance application the content based video transmission is proposed to dynamically adjust the transmission quantity as well as limited bandwidth. In order to correctly detect moving object from capture frames voting based motion estimation algorithm is used. Then the image which is captured can be successfully compensated by adjusting between current and previous frame . After compensation the morphological operations such as Dilation and Erosion are applied in order to achieve moving edge detection. Temporal sampling is used to correctly detect the moving objects in captured frames and spatial coding is used to identify the importance of image content. this two sampling mechanism provides improvement in the quality of image and effectively decrease the bandwidth utilization for users.

Prof. V . B. Raskar ,BE ECE, ME Electronics. he is an Assistant Professor at JSPM's ICOER.

Snehal Y. Nikam, Student of BE ECE at JSPM's ICOER, Pune.

Kiran B. Patil, Student of BE ECE at JSPM's ICOER, Pune.

Ganesh A. AbnaveStudent of BE ECE at JSPM's ICOER, Pune.