

VIDEO TO FRAME CONVERSION OF TV NEWS VIDEO BY USING MATLAB

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ABSTRACT

The video is a one which plays a major in the today's life which consisting of number of frames a set of frames will form the shots and the group of shots will produce the scenes, the combination of different scenes will form the video. In order to analyses any video, first we need to study then characteristics of the frames and to analyze the properties of the video this is done by the video to frame conversion using Matlab.

Keywords: Histogram, Shot Detection, Frame Conversion

I INTRODUCTION

The extraction of valid information from the video is do in order to process video data efficiently and reduces the transfer stress of network, hence more and more attention being paid to the video processing technology, the segmentation is one of the most popular in the reduction of data which is carried by the video signal along with the key frame extraction so the present researchers are ore concentrating on the above two techniques here we are using the background information and histogram as a key parameter for the frame conversion techniques.

II BACKGROUND

The video to frame detection can be done by using so many software's which are available in the market today however when we are using this software to get the frames from the video software will decide in the begin itself how many frames we need per second so which indicates that there will be a chances of missing the frames on which we are concentrating more, normally the number frames per second will be different for the different cameras.

- 18 frames per second in the earl motion picture films
- 24 frames per second in movies and camera
- 3. 300+ in high speed cameras
- 2500+ in very high speed cameras

The frame extraction play the vital role in many video processing applications like content based video retrieval, shot detection, segmentation, CC cameras , etc the work search us concentrate on the CC Cameras which is placed in the ATM centre, which is kept in the ON state for though out the day for recording purpose. Instead of keep it for on state for more all the time we can place the sensor near the door and the sensor will sense the human being who comes near the door for that movement cameras will be on but this is not an efficient method compare to the video shot detection techniques, here we are applying the video shot detection technique to the camera which is associated to the ATM Machine. The shot detection technique is implementation involves background information, today we are facing the problem of data storage in image and video processing application, but mean while the market is demands for image and video processing applications which requires the storage memory of more Hence in order to sustain in the market to the previous devices along with we need to adapt some of the algorithms' they should support the memory management the bellow flow chat will give the information about the video shot detection algorithms which is applied for the ATM machine.

III SHOT DETECTION

There is a good exposure of research which is done for the video analysis using the content extraction in the early days the techniques are focused on the cut detection but most of the recent work has been focused by the transition Detecting and few other techniques,

The techniques which are employed in the shot detection are s follows

- A. Sum of the absolute pixel difference
- B. Histogram comparison
- C. Statistical difference
- D. Edge difference (edge change ratio)
- E. Threshold comparison
- F. Motion vector

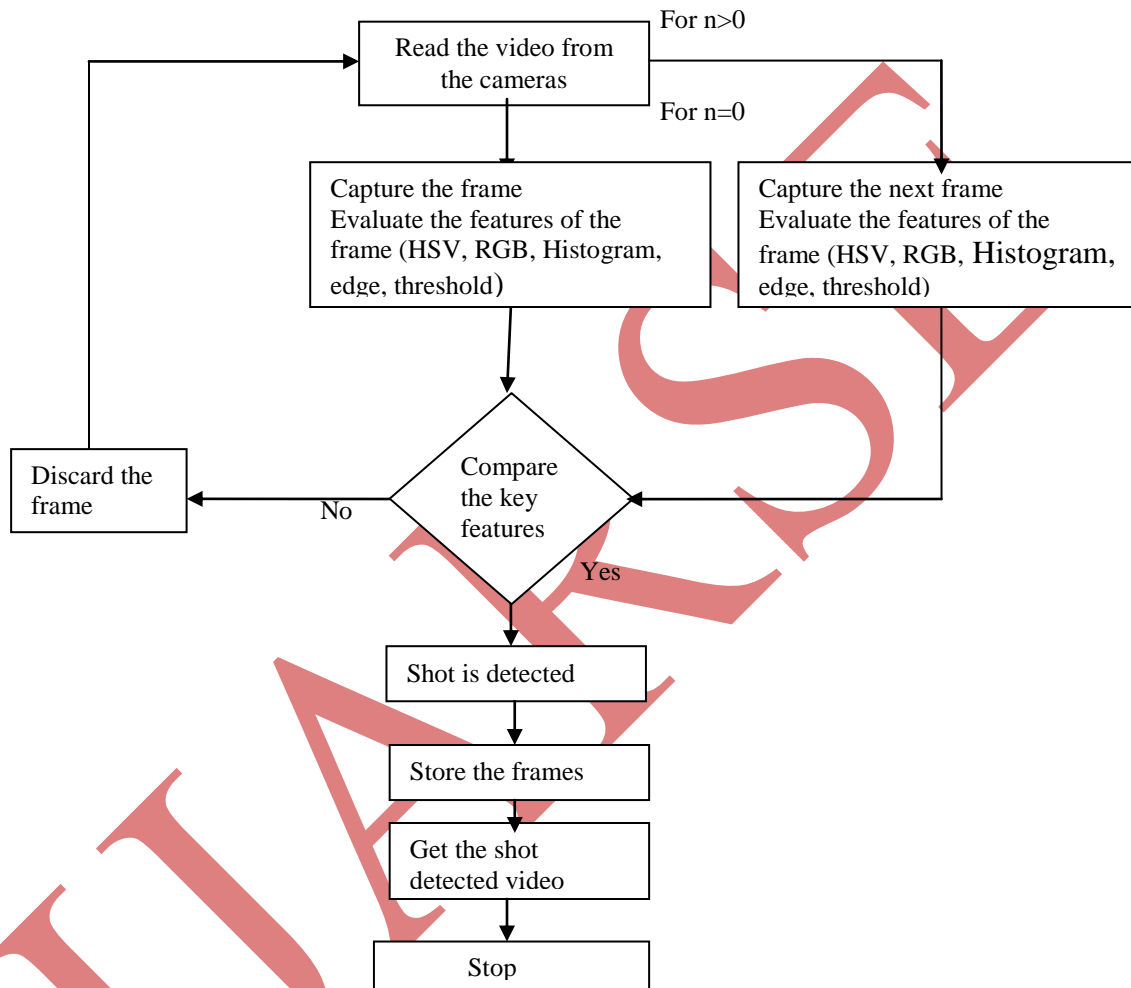
IV FLOW CHART

In this flow chart first we read the frames and check with matching of each frame content to decide wheatear the frame is detected or not

- 1) SAD (Sum of the absolute pixel difference) is the most common and most simple algorithm, where the two consecutive frames are compared pixel by pixel.
- 2) Histogram difference computes the difference between the histograms of two consecutive frames.
- 3) Statistical methods expand the idea of pixel difference by breaking the images into regions and then comparing the statistical measures of the pixels in those regions.
- 4) Edge change ratio is one which will determine the number and position of the edge and hence we can compare the actual content of two frames by transforming both the frames to edge pictures.

- 5) Threshold comparison here first determine the threshold values of present frame is compared to next frame and if the score is higher than shot is detected.
- 6) Motion vector analysis is done by the motion vector determined from the block matching.

The following figure shows the flowchart of the algorithm used for the implementation



V ALGORITHM

Consider the frames which are converted from the video by using the matlab code

Let $F(k)$ be the k^{th} frames in the given video, where k will takes the values from $k=1,2,3,\dots,n$, the shot boundary detection algorithm for the above frames can be explained as follows

Step 1: Split the given frames into block with m rows & n Columns $B(i,j,k)$ stands for the block at (i,j) in the given frame.

Step 2: Computing the histogram matching difference between the neighboring blocks in consecutive frames for a video sequence $H(i,j,k)$ and $H(i,j,k+1)$ stands for the histogram of blocks at (i,j) in the k^{th} and $(k+1)^{\text{th}}$ frames respectively the block difference is measured by using the flowing equation

$$D_B(k, k+1, i, j) = \sum_{i=0}^{L-1} \frac{[H(i, j, k) - H(i, j, k-1)]^2}{H(i, j, k)} \dots\dots\dots(1)$$

Where D_B = block difference

Step 3: Evaluate the histogram difference between the two consecutive frames by

$$D(K, K+1) = \sum_{j=1}^m \sum_{i=1}^n W_{ij} D_B(k, k+1, i, j) \dots\dots\dots(2)$$

Where W_{ij} is the weight of the block at (i, j)

Step 4: calculating the threshold by the use of mean and standard variance of histogram which are differ over the whole video sequence and is different for different kind of information extracted. Mean and standard variance can be calculating by using the following equations

$$MD = \sum_{K=1}^{n-1} D(k, k+1) / n - 1 \dots\dots\dots(3)$$

$$STD = \sqrt{\sum_{k=1}^{n-1} (D(k, k+1) - MD)^2 / n - 1} \dots\dots\dots(4)$$

Step 5: Calculating the total number of frames

- 1) Reference frame: it is a first frame of each shot.
- 2) General frame: all other frame except the reference frame.
- 3) Shot dynamic factor $\max(i)$: it is the maximum histogram within a shot i.
- 4) Dynamic shot: if its $\max(i)$ is bigger than the mean value.
- 5) Static shot: if $\max(i)$ is less than mean value.

Where $F_c(k)$ is the k^{th} Frame with in a current shot,
 $K=1,2,3 \dots F_{CN}(k)$ $F_{CN}(k)$ stands for total number of the current frame

VI RESULTS AND PERFORMANCE ANALYSIS



The TV NEWS video frames of DD1



Figure 1: Frames Of Different Videos



Figure 2: Sample Videos Used Fro The Frame Conversion.

This paper gives the idea about the influence of video to frame conversion techniques which are existing frame conversion is one of the most important process whenever dealing with the image and video processing applications they involve video shot detection, key frame extraction, segmentation, video retrieval, etc. For all the above applications we require the frames and e processed the number of frames per second will differ for the kind of device that is used.

As each video consisting of its own number of frames decided by the size of the video, Whenever we are converting video to frames, the frames requires more memory than that of the original video. In this paper we have implemented the above algorithm discussed above as above when compared to the other techniques of video to frame conversion this can able to read the video in the suitable formate like avi or flv etc otherwise convert the given video into the suitable formate before processing the data.

The following table shows the simulation study results for the various TV news videos with their size and number of frames in the converted video.

TABLE I : SUMMARY OF THE VIDEOS

SI No.	Name of the video	Size	Total number of frames
1	ETV News	17.1 MB	8288
2	TV9 News	16.2 MB	6126
3	NDTV News	10.7 MB	4975
4	DD1 News	8.23 MB	3765
5	NDTV News	5.08 MB	1332

VII CONCLUSIONS

In this paper we have explained and conducted an experiment for the video to frame conversion in terms of its feature analysis as explained above by taking the varieties videos from the different news channels like DD1 News in English, ETV Kannada, TV9 Kannada each of the video is differ in terms of size and number frames. The above table will provides the summary of each video in terms of total size of the video and total number of frames.

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