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Segment Based Indexing Technique For Video Data File

D.Saravanan
Dept of Operations & IT,IFHE University, IBS Hyderabad501203,Telangana State, India.

Abstract

A video is an effective tool to exchange the information in the structure of showing the brief text message due to the advance developed technology. Video capturing is effortless process but the related video retrieval is the difficult process, for that process the videos must be indexed. Retrieval is the method that retrieved a video using a user query .The query will be image or texts depend upon the query result output system that returned a particular video or image based on that query. In this project we create a indexing for video file by using segment based indexing technique. Here video will be divided into a hierarchy which is in storyboards of film making. For instance, a hierarchical based video search is composed into multi stage abstraction for assist the users to locate the specific video segments/frames logically. This paper brings out the reduced bandwidth and reduced delays the video through the network of searching and reviewing. Experimental results verify this.

Key terms: Video data mining; video content retrieval; image query ; indexing ; clustering ; key frame ; Grouping.

1. Introduction

Data mining is a process of detecting knowledge from a given huge set of data. Of the available huge data set, multimedia is the one which contains diverse data such as audio, video, image, text and motion, and video data plays a vital role in the field of video data mining. In short, the application of video data is called video data mining. Data mining technique can be applied in various documents. The acquisition and storage of video data is an easy task but retrieval of information from video data is challenging. The general method of representing each video segment is shot that is a sequence of key frame(s) where those frames contained the 'meaningful' frames also the frame contained the important contents of the shot. The key frame(s) based shot method is specifically assisted for searching the video content as clients provided image query/search where an image will be matched with the indexed key frames with assist of resemblance distance. As a result, the key frames selection is most significant and several methods are used to automate the process. The key frame selection is having two main issues:

1. The number of key frame(s) utilized, (The first issue is tackled by where the amount of key frames for every shot will be decided arbitrarily using the shot length).
2. The significant representative frame(s) selection in a shot. (The second issue is generally complicated for choosing the frames automatically with maximum semantic value. This issue is handled through minimizing the redundant frames with the help of the methods, for example relevance ranking)

The main objective of this research work is to increase the performance of clustering in video retrieval process.

RGB value of frame is used to eliminate the redundant frame.
Segment based indexing technique is used to indexing the key frames.
Hierarchical clustering algorithm is used to clustering the frames

Few basic properties about an image can be obtained from using a Histogram, The shape and the concentration of the colors in the histogram will be the same for similar objects even though they are of different colors The system has to differentiate between the both the basic concept behind the histogram generation is simple. Each pixel in the image is scanned and the respective color or intensity value is obtained for the pixel.

iColor = (16 * p1[0]) + p1[1] * 4 + p1 [72] Then a graph is generated with total number of pixels against the pixel intensity.iHistoArr [iColor] = iHistoArr [iColor] +1 ..

1.0 Existing System

The existing methods for video lecture segmentation, annotation and classification mainly focus on either audio features or low-level visual features. Some of the works make use of high level semantic information like, drawing,

E-mail address: sa_roin@yahoo.com

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erasing, scrolling and explaining, writing, erasing and speaking and gesture of instructor. Existing system utilized color moments to classify video frames as narrative or text based (slide, web or whiteboard) using Decision Trees.

1.0.1 Issues in Existing System

- Less prediction accuracy
- Increased time complexity
- Key frames are often not enough to represent information in a shot.

1.1 Proposed System

- RGB feature is used to remove redundant frames in the query video.
- Segment based Indexing technique is used to segment and indexing the frames.
- Hierarchical clustering mechanism is used to cluster the frames.

1.1.1 Advantage of Proposed System

- Can be easily automated
- Segments reveal temporal structure well (eg. In hierarchy)
- Supports queries by image similarity

1.2 Functional requirement

Input: The input of this work is the query video.

Behavior: The behavior of this project is the input video is converted into number of frames. Using frame extraction process, redundant frames are eliminated. Using segment based technique, segment the frames. Finally, user retrieves relevant frame for given query image.

Output:The output of this work is retrieved relevant image.

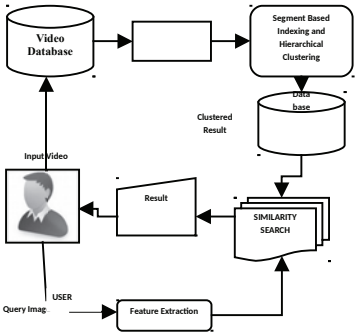

Fig 1. Proposed System Architecture Diagram

2. Literature Study

The usage of non-scripted lecture videos as a part of learning material is becoming an everyday activity in most of higher education institutions due to the growing interest in flexible and blended education. Generally these videos are delivered as part of Learning Objects Exploiting visual actions present in non-scripted lecture videos can be useful for automatically segmenting and extracting the structure of these videos. Such visual cues help identify possible key frames, index points, key events and relevant meta-data useful for e-learning systems, video surrogates and video skims [6]. MUST-VIS introduces a multi-modal algorithm for lecture segmentation based on video and audio/text, and annotates segments using keyword clouds, which offer direct access to the information content, while taking into account the major speaker actions. This research presents the MUST-VIS system for the Media-Mixer/VideoLectures.NET Temporal Segmentation and Annotation Grand Challenge.[7] research reports on the development and evaluation of the new NoteVideoand its improved version, NoteVideo+,systems for identifying the conceptual ‘objects’ of a blackboard-based video and then creating a summarized image of the video and using it as an in-scene navigation interface that allows users to directly jump to the video frame where that object first appeared instead of navigating it linearly through time[8].

E-mail address: sa_roin@yahoo.com

3. Experimental Setup

The experimental setup consists of the following operations.

Video Preprocessing
Extraction
Segment Based Indexing
Query Retrieval

3.1. Video Preprocessing

In the image pre-processing where the input image is taken from the camera which is either a video file or a digital image. In video files, the images are segmented as frames that contain lot of impurities such as noise but it may be it is eliminated during the preprocessing steps. Finally the needed image based on the user's requirement is received

3.2 Training of Images

After extracting the image features like texture and matrix conversion, the pixel values are trained in the database by labeling the features of the images. The matrix conversion is done by giving intensity at each point x, y and RGB values are found [A matrix will be formed having M rows and N columns]. Then the images are labeled in the database. So, it can be retrieved from the database easily. This labeling is done by the features of the image. Now, the image is stored in the database.

3.3 Frame Extraction

The converted frames are taken as an input for frame extraction process. In frame extraction process, RGB value each and every frame in the video was calculated. Then set the threshold value for remove redundant frames in the

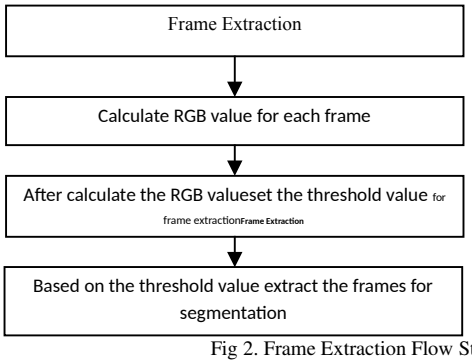

Fig 2. Frame Extraction Flow Steps

3.3.1 Algorithm for frame Extraction:

Step 1: First, the image is given as the input to from the camera.
Step 2: Initially, this image is a raw image where it contains noise.
Step 3: Then, the Features like Texture, Color and Shape are extracted by the RGB values.
Step 4: Features values and database values are matched. The content of the image is also retrieved

3.4 Segment Based Indexing

This module describes the details of details of segment based indexing process. In segment based indexing process, a video can contain stories. Each of the stories contains a set of scenes, each scene is then further partitioned into shots, and each shot is comprised of a sequence of individual frames. Thus, in this indexing framework, we have defined that a frame is a single image/picture, a shot is a sequence of frames with similar characteristics, a scene is a sequence of shots that correspond to a semantic content, and a story is a sequence of scenes that reveals a single semantic story. A variation of this hierarchy is presented in which a video document usually has one or more purposes such as entertainment and information. The indexed frames are further clustered using Hierarchical

E-mail address: sa_roin@yahoo.com

clustering. Experiments are conducted based on different video frames like 75,150 for various video files ie cartoon, criket, debat, song and news video data. Information are recorded based on number of frame count ,time take for the particular frame. It is shown in the tab 2 in detail.

Pseudo code for indexing

```
public void setStatusText(String text) {
        this.statusBar1.setMessage(text);
}
private void initActions() {
        URL actionURL = ImageAppFrame.class
                .getResource("resources/actions.xml");
        manager = ActionManager.getInstance();
        try {
                manager.loadActions(actionURL);
        } catch (IOExceptionioe) {
                System.out.println("ERROR parsing: " + ioe);
                ioe.printStackTrace();
        } }
        public static void initActionHandle(ImageAppFrame frame) {
        gah = new GeneralActionHandler(frame);
        qah=new ActionHandler(frame)}
```

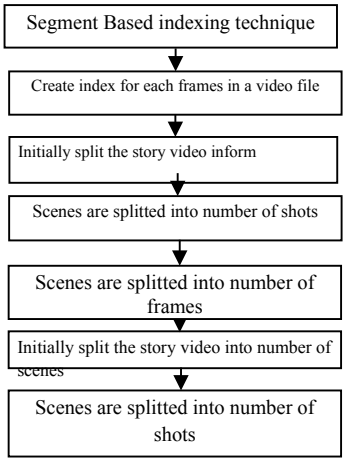

Fig 3. Segment Based Indexing Technique process flow diagram

3.5 Query Retrieval process

In query retrieval module, user gives query image to the storage server. Extract features from query image. Then the feature extracted frame is compared with the clustered result. Finally, matched frames are displayed to the user.

6. Summary and Conclusion

6.1 Conclusion

In this paper the proposed an efficient framework for image retrieval from the given video. The two important techniques for the efficient retrieval are RGB feature and segment based indexing mechanism.RGB feature remove redundant frames in the given video. segment based technique is used to indexing the individual frames. finally the hierarchical clustering mechanism clusters the video frames. when the user inputs the query image, the image is processed and then compared with the relevant image in the database and the corresponding result is displayed. we would like to put forth that our above mentioned framework is very efficient and displays the result quickly.

E-mail address: sa_roin@yahoo.com

6.2 Future Enhancement

The proposed concept of video search based on frames or images using segment based indexing technique is easily automated. It has a well defined hierarchical structure. The user can also use the image as a query to retrieve relevant image from the database. The usage of RGB feature saves time by avoiding repeated frames(which can accumulate extra space in the database).on the whole, the indexing technique comprehensively serves as the quick search technique which uses segment frames.

7. Experimental Outcomes

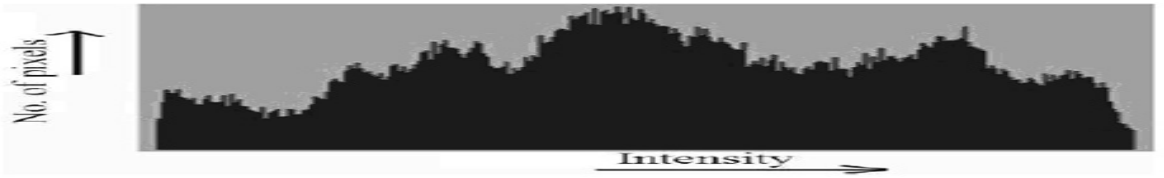

Fig 5.Histogram Generation

Fig 6. Select Video

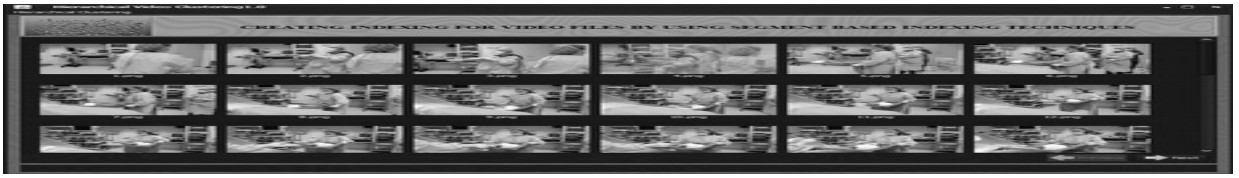

Fig 9. Frame Conversion process

Fig 12. Indexing Frames

Fig 14. Select Query Image

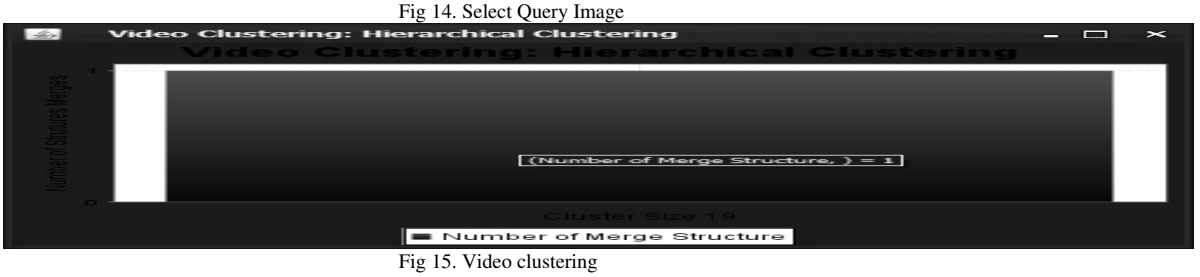

Fig 15. Video clustering

Fig 16. Performance Comparison graph for Various video file

E-mail address: sa_roin@yahoo.com

Table 2. Frame comparison for 150 Frames

Frames	Segment Indexing Technique	Video Type
150	1159	Cartoon
150	656	Cricket
150	1254	Debate
150	458	News
150	1400	Songs

Table 2. Frame comparison for 75 Frames

Frames	Sequential Indexing Technique	Video Type
75	1259	Cartoon
75	1245	Cricket
75	1100	Debate
75	520	News
75	1540	Songs

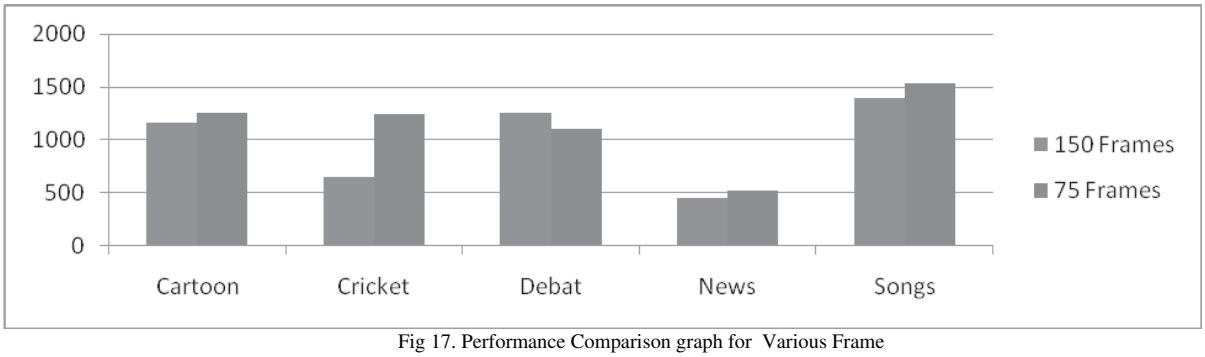

Fig 17. Performance Comparison graph for Various Frame

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E-mail address: sa_roin@yahoo.com