# Image Frame Mining Using Indexing Technique

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**Abstract** Data mining is a technique the bring out hidden information effectively from an available data set. Most of this extraction works well when performed for binary and character information. Mining information form images is a challenge today for many researchers. Creating of images and videos is easy as it does not require any domain knowledge, but extracting the required knowledge is difficult. For this reason, today video data mining is an interesting area for many researchers. To overcome these problems many researchers are motivated for finding an effective retrieval and indexing technique. This research paper brings a new technique for video content retrieval using hierarchical clustering technique. Objective of this work is to extract image key frames from the trained image set and use this as an image input query. The experiment proved that the proposed technique provided better results than existing video retrieval and indexing technique.

**Keywords** Data mining · Key frame selection · Clustering · Video data mining · Image mining · Histogram · Hierarchical clustering

## 1 Introduction

Increasing the demand of video content, video data retrieval is most challenge and complex process today. On the other hand, the quantity of video and audio data produced in earlier days is gradually growing due to the large quantity of digital devices such as surveillance cameras, digital cameras and camcorders etc. This vast amount of video data is not managed and mined effectively by the effective tools. Increasing this data's day by day need urgent attention in this particular field. Today number of technique and tolls available to extract the content from the web,

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but none of them never produce the effective result it force to develop a new technique or algorithm in this particular field. However, there exists valuable information behind the video data; the increasing data volume creates complexity to humans in extracting them without sufficient tools. Number of technique produce effective result in data mining for which group the data set reduces the burden and reduce the searching time of the user. Hence nowadays, the video database is the research area and its characteristic should be examined. The significant attributes in the videos are Motion, Texture and Color, which are not fully utilized by the retrieving and indexing. For the above discussed problems, the research work has the following tasks:

- Video clustering and indexing
- Video retrieval

The research work was proposed to perform video arrangement based on the content property and arranged based on their similarity. The techniques to classify the various types of videos, which make use of the result of the content based on the input frames. Most the existing technique perform effective grouping based on the content nature. clustering consists of dividing the data into homogenous groups or else granules, which depend on the same objective function which maximize the inter cluster distance. Consequently the video clustering is differing from the traditional clustering algorithms. However the videos are in the unstructured format. Thus preprocessing the video data is necessary to obtain the structured format of the video using the computer vision techniques or image processing. Most of the data sets are grouped because to reduce the searching time. It must be taken as a parameter when processing the video data.

## 1.1 Problems in the Existing System

1. Video clustering differ from the traditional clustering techniques, existing technique allow the user one scan, it generally very difficult for video data mining.
2. Video data consist of various attributes such as motion, texture and color this attributes are dynamic in nature they are changed during time. Among this dynamic nature identify the particular character is difficult.
3. The growth of video data and insufficient of data storage it lead difficulty for data extraction.
4. Existing clustering algorithms are not support effective parameters for data extraction.
5. Existing system produce not eliminate the noise effectively, it increasing the searching time.

## 1.2 Advantage of Proposed System

1. The propose technique offer less memory space and we want to minimize the time required for I/O.
2. Easy to handle any forms of distance.
3. Applicable to all kind of attributes.
4. Embedded flexibility about the granularity level.

## 2 Literature Survey

This paper discusses the current video data mining technique and indexing problem. This paper brings the video data retrieval using one of the hierarchical clustering algorithm CHEAMELEON clustering. This paper also made comparisons with existing clustering algorithm against chameleon in terms of various video files. Author concluded the truthfulness of groping the item set based on nature of the data set D. Saravanan [1]. This paper brings design of hierarchical clustering algorithm best suit for video data retrieval it brings the number of frame based on the input frame. The proposed technique based on the hierarchy model for classify the items. This model occupy less space compare to the existing techniques and it well suited for any type of image files The proposed technique also gives the similarity between hierarchical clustering algorithm which currently used for video data mining. D. Saravanan [6]. This paper brings the size of video files currently available due to the growth of media. It also brings the idea of cluster a video files based on the metadata, Algur et al. [4]. As per Abhilasha Yadav et al. [9] video security is more important but in the case of video data all cryptography algorithm are not suitable. They proposed new advanced encryption standard based algorithm to solve the above problem. This paper brings the image segmentation using fuzzy harmony search based algorithm using different image sources such as MR, CT and RGB images, Panda et al. [3] (Fig. 1).

## 3 Experimental Setup

The behavior of this work is the input video is converted into number of frames. Using frame extraction process, redundant frames are eliminated. Using clustering technique, frames are grouped. Finally, user retrieves relevant frame for given query image.

- Video frame progression
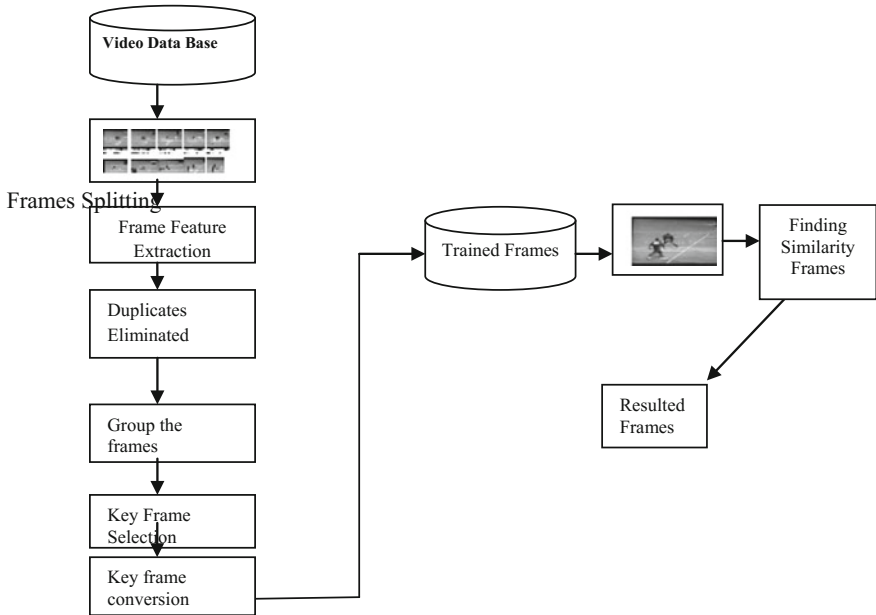- Train the input image
- Image mining
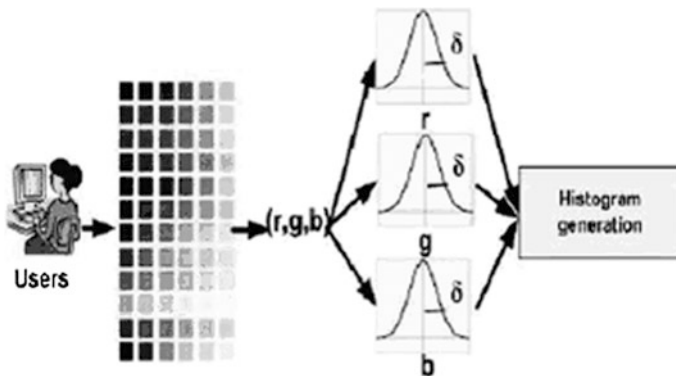- Video Indexing

**Fig. 1** Proposed architecture



**Fig. 2** Histogram generation

## 3.1 Video Frame Progression

A set of frames ordered by a time manner it is called video sequence. Initially the motion images are transformed into frames and that are stored into the database. This process shown in the Figs. 3, 4 and 5.
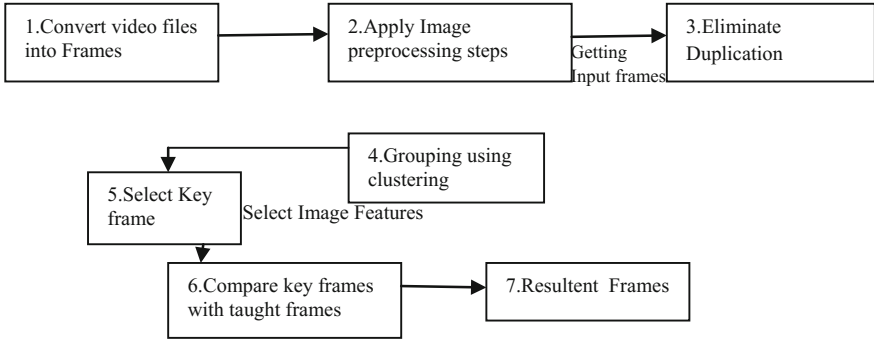
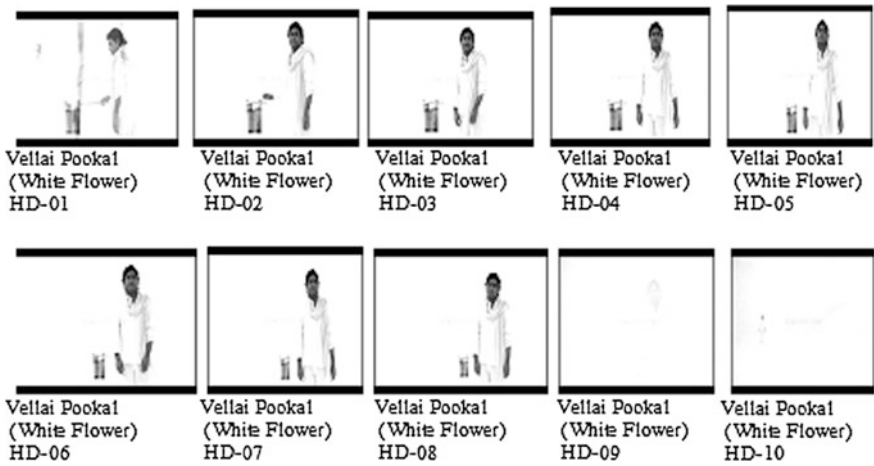Fig. 3 Overall process of video indexing



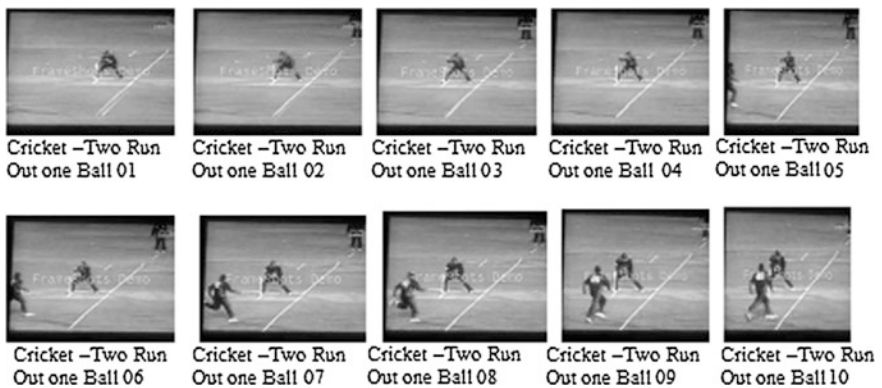Fig. 4 Video segmentation song video file



Fig. 5 Video segmentation sport video file

## 3.2 Train the Input Image

Increasing the demand of multimedia today images are essential technique to communicate each other. It reduces the burden of the user instead of sending a detailed text information. Demand on this filed, creation of video file is unforced method but the retrieve the needed content among the huge data set is the difficult method. For this stored image files are properly trained. After the image segmentation use image color value to differentiate one image with other. Here we use image threshold value for calculate the difference between two image frames, use this eliminate the duplicate images. After this grouping frames are taken as image indexing technique.

### 3.2.1 Comparison of Picture Element Values of Frames

```
            For A = 0 To A1 - 1
        Image1 = ShowBM.GainPictureElement(A, B)
        Image 2 = ShowBM.GainPictureElement (A, B + 1)
        If THRESHOLD < Image1.G Or THRESHOLD < Image2.G Then
           If Image1.G <> Image2.G Then
              ShowBM.GainPictureElement(A,B,
    ColorTranslator.FromWin32(RGB(255, 0, 255)))
              End If
           End If
```

### 3.2.2 The Process Explained as Training of Key Frames as

Step 1: Select Image formation
Step 2: Identify the Picture Element value of step 1 input frame.
Step 3: Calculate RGB value of each frame.
Step 4: After step 3, help of threshold value for removing duplicate frames. For this set the threshold value.
Step 5: Compare the step 3 and step 4, if threshold standards are in the particular value the frames take, if the value are not in the specified range that particular frame eliminated as replica frame.
Step 6: After eliminating duplication, rearranging the frame.

## 3.3 Image Mining

Video data contain many image frames also called images. Every frames contain RGB picture element that used to differentiate one image frame with other frames. Toady most of the image extracting technique based on RGB color model. This RGB picture element used to compare the input query image and stored database image. After extracting the image property the pixel values are trained in the database by labeling the features of the image. The query image picture content compare with the proposed clustered like hierarchical clustering. The relevant result are then return to the user based on the input query image. Figure 2 here show the calculation of image threshold value used to compare two different frames.

## 3.4 Video Indexing

For effective retrieval images are arranged properly. Every images contain RGB pixels that used to arrange the frames effectively.

### 3.4.1 Suede Code for Comparing Frames

```
A =Picture width
    B = Picture Height
    A1 = A / 2,      B1 = B / 2
    bmptemp = DisplayBM
    For f = 1 To f1 – 1,         For g = 1 To g1 - 1
        colorpixel = DisplayBM.GetPixel(x, y)
        Ingcolorpixelvalue = (0.299 * shadevalue.Red) + (0.587 * shadevalue
 Green) + (0.1114 * shadevalue.Blue)
        GreyScale(x, y) = lngGrayScaleValue color
```

## 4 Advantage and Disadvantage of Video Indexing

There are a lot of advantages and disadvantages in video indexing techniques. For this here a table constructed compare the functions of video indexing such as Annotation based, Attribute oriented functions, and Area precise. It is shown in the Table 1.

**Table 1** Features and characteristics of video indexing techniques

| Functions | Annotation-based | Attribute oriented | Area precise |
|---|---|---|---|
| Essential method | Video OCR, CC analysis, speech recognition | Information's are processed through image action and point extraction. Image attributes such as sound identified through the attributes volume, pitch rate. Image analyzed with the attributes such as pixel, text and more | It works every functions. Property of sound and image used for entrainment, news, songs |
| Data set arrangements | semantic concepts are soaring by can be mined by language response | Image functions are extracted used image data set | Used general method for video type |
| Feature explanation | Certain function are regular since video OCR, language identification | Low level properties are unable to join with semantics. In certain type of videos attributes may unneeded example sport videos | Information's are completely shared via general attribute of the video files. Example in song video various information such as singer name, musician names can be shared |
| Mine the image low level feature | Low-level functions are eliminated | Based on image low level property the semantic annotations are identified | With help of re take part in the segment limits are identified |
| Information extraction | Information's are extracted based on keywords | Investigate are done with help of image | Use the extraction characteristics and functions |

## 5 Experimental Outcomes

See Figs. 6, 7, 8, 9, 10, 11.

## 6 Conclusion and Future Enhancement

Development of technology brings the enormous image application. Create and uploading of this image information's are easy, but retrieve the proper content is complex task for many user. There is no proper technique and algorithms are not available in this domain. Today image perform major role almost every application of users day to day life. The most challenge task for image retrieval, they never captured properly., most of the image files are capture reduced illumination, worst
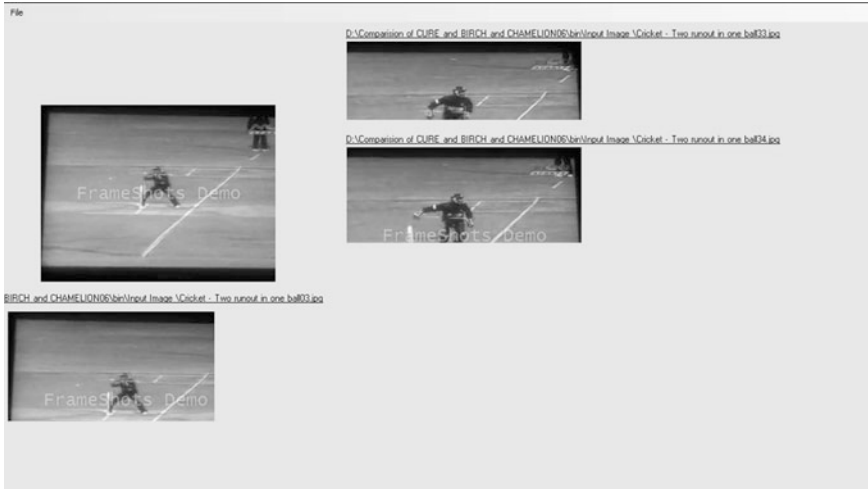
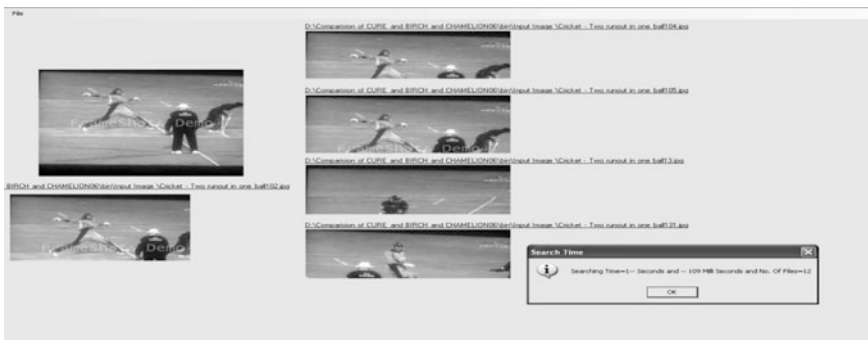**Fig. 6** Based on Sport input key frame output Case1: 1-input file and 9 output files



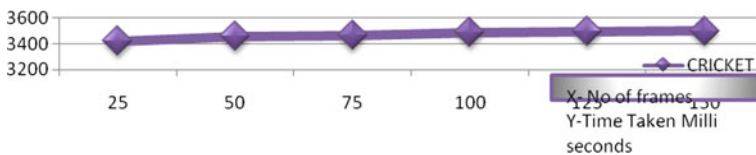**Fig. 7** Based on Sport input key frame output Case3: 1 input and 13 output files



**Fig. 8** Performance in sports video

background and images are capture by un trained persons. Here the experiments prove that propose method produce good results, outcomes are verified that. In future the same technique applied to other hierarchical clustering algorithms.
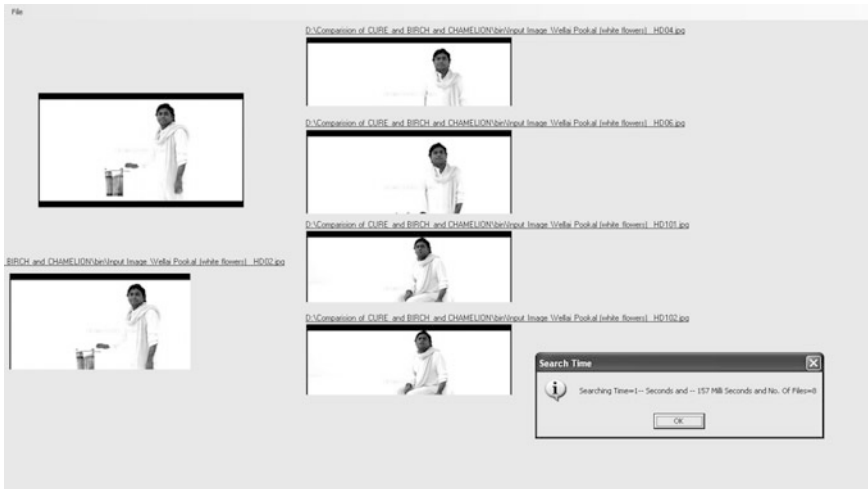
**Fig. 9** Based on Song input key frame output Case 1: 1 input and 4 output file



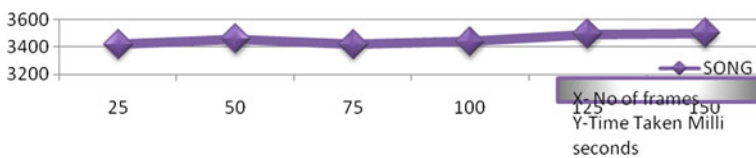**Fig. 10** Based on Song input key frame output Case 2: 1 input and 1 output files



**Fig. 11** Performance in news video

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