Color Content based Image and Video Retrieval

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ABSTRACT
At the present time content-based image and video retrieval is a rising technology. There are considerable challenges involved in the adaptation of image database and video database for the effective retrieval procedure. We can suggest a techniques using video and image retrieval that can be useful in the real world. Retrieval of information according to the user's requirement is the need today. Content based video retrieval system, works as user to retrieve a video within a potentially large created database of images and videos. Content-based video retrieval systems are less common than image retrieval systems and also an upcoming research area. Features like texture, color and shape are considered for retrieval. The main advantage of the system is it compares image database to retrieve the required video, each feature of the video, and the performance is analyzed. Content based video retrieval has applications in different areas such as news, advertizing, video archive, education system and medical sciences etc.

General Terms
Image /Video retrieval in image processing.

Keywords
Color features, Euclidean distance, Feature extraction, Retrieval techniques.

1. INTRODUCTION
Content based methods are applied in order to improve all types of multimedia retreieval.To increase the effectiveness of content based methods which are used in media collections and enhance retrieval accuracy, we have to do appropriate pre-processing on the images, such as size of the image, image transformation, quantization, normalization and extraction of image characteristics as per need from the image according to the contents of images to keep in the database. The quality similarity measure employed for mapping textual query terms to visual concepts is considered as a key factor in content based retrieval. CBVR has two approaches attribute based and object based .Content based image and video retrieval can be done by color, texture, shape, browsing, different types of attributes, motion text and domain concepts. In content based image and video retrieval two phases are required .These are i) Database population phase which contains videos, Shot boundary detection, selection of key frames, and feature extraction on the basis of content. ii) Video retrieval phase which contains absolute difference calculation. Absolute difference is used for comparing feature vectors according to the database images [2]. Content-based Image retrieval systems consist of query by example method or semantic retrieval method. Query by example method contains a sample image which is used for querying, then matching the query on the basis of content as color, shape, and texture retrieval method which contains, textual information attached to the image to retrieve accurate images. This paper will describe in brief about introduction, color features, methods used for extraction of features, implementation, experimental Result with different methods, and conclusion.

2. COLOR FEATURES
Color is very much important visual features of the human eye perception in accordance with image and video retrieval. Color features are very constant and stout as compared with shape and texture content based mechanisms [1]. The majority of color spaces are RGB and HSV. In comparison with RGB and HSV, HSV is more efficient because we can use it in real time applications like river, mountain videos or images. Disadvantage of RGB is it has very much constraint in terms of transformations and depth. A histogram of color image is the widely used method to extract color features but instead difference graph is used. for retrieval of image from database it has to be resized first, that is preprocessing is done and then after we can compare image database and video database to retrieve any video on the basis of color. In a color features an image is divided into a small number of subimages and HSV (e.g. hue , saturation, and value intensities) for average color components are computed with every subimage.Hue contains eight values,satuation contains three values and value parameter contains three values, in shot they are saving intensities in the form of values. The overall image is presented by color vector components which indicate a particular dimension of the vector corresponding with subimage location [5].

3. METHODS
3.1 DCT for Color based Video Retrieval
Discrete Cosine Transform is a Fourier-related transform which is similar to the discrete Fourier transform, but it uses only real numbers. It operates on the matrix form and mostly we can make a calculation in mat lab as y = dct (u) %.it depends on the size of the frame, its values must be be a power of two [1].

3.2 Global Color Video Retrieval (GCVR)
Commonly used RGB color feature does not fulfill the visual requirements of people, in video retrieval, t normally we have to convert video from an RGB color feature to other color feature. We can use HSV space as it is a more advantageous color feature. The global color is a simple method for extraction of image and video features. The benefit of global feature extraction is its high speed for extracting features as well as similarity calculation. Global features are always very much rigid to represent an image or video .disadvantage is, they are oversensitive to location and so fail to search important visual characteristics also the global color only calculates the color features. The most detail information of color is lost. Two completely different images can get the same global color difference graph, which will cause retrieval errors. The feature is invariable to rotation and translation [3].

3.3 Block Color Video Retrieval (BCVR)

In the block color, an image is divided into n×n blocks. Each block will have less computation time if the block is too bulky, then computation time of retrieval process will be increased if the block is too small. A two-dimensional space divided into 3 × 3 will become more effective. For each block, we must carry out a calculation of the color cells conversion and by the process of color quantization. As image may be divided into small, nonoverlapping blocks, and features are computed for all blocks to reduce computation. They are local features because of the minute block size, but the total of computation is only a fraction of that for obtaining features around every pixel [3].

3.4 Counting Similarity of Frames from each Image/Video

The first step for video retrieval based on dividing the video into fix number of frames. It will contain processing like key frame extraction or queries may be directed at key-frames using query by retrieval algorithms. Next step is to count features for finding Euclidean distance. It contains the low level features and high level features and on that features it will apply global color based method and block color based method. Next step is to find matching videos. We use here absolute difference (AD) for similarity measurement of feature vectors of the videos in content based video and image retrieval. In this, the feature vectors of a query video are compared with feature vectors of all the videos stored in the database of image as well as video by taking absolute difference between them. The differences will be ordered in increasing manner to show most matching searches on top, as the videos with which the absolute difference will be lower will be most matching ones. Next step is to calculate distance metrics according to the image database and video database proposed method compares with the images in the given in query and compare with video database with their video features as with each frames from the video for the each frames in each video it calculates Euclidean distance which takes the mean of the distances

Calculated and then it is stored into the feature vector [1].

Algorithm for Video Retrieval

1. Convert the images from RGB space to HSV space.
2. Quantify the images using formula.
3. Count each feature value.
4. Calculate similarity by Euclidean distance using formula as we can use in mat lab program.

d(j+1)= sum((feature(i+j,:)-search feature).^2);

4. DATABASE

In small training databases the videos are categorized in number of frames as each video is divided into five frames containing similar videos. From total videos we will compare data set for experimentation. All the videos are normalized as the videos are selected such that those of same categories differ very minutely in color content. In given database the image as described in example which is compared with the video database for color feature extraction values.difference graph shows values of the Euclidean distances . In large database the images are considered from large training database. All the images are compared with video database for color feature extraction. Following image database is used in the proposed method.

Fig 1: Sample Image Database

Table 1: Computational Time showing difference

Computational Time (In Sec.)	Euclidean
	4.6

5. EXPERIMENTAL RESULTS

color space and AD similarity measurements are considered for calculating the values with both methods i.e. global and block then values are arranged in ascending order so as to find closest match among the videos in database. Smaller the value is better for the both method CBVR performance. Basic need is to handle fast growing database and efficient retrieval. With each frame, the feature vectors are used for processing query. Comparing sequence of frames and feature vector of each video,the relevant or closest matches are displayed as relevant results [3].

Table 1: Search image Accuracy percentage

Search Image Method	GCVR Accuracy %	BCVR Accuracy %
Image 1	85	90
Image 2	90	95
Image 3	84	89
Image 4	60	60
Image 5	89	67
Image 6	55	60

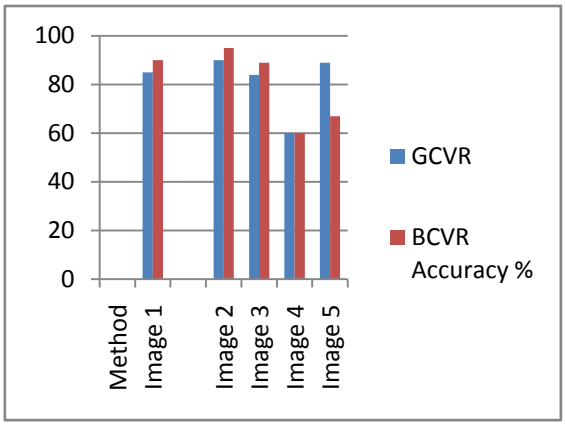

Fig 3: Accuracy by GCVR and BCVR

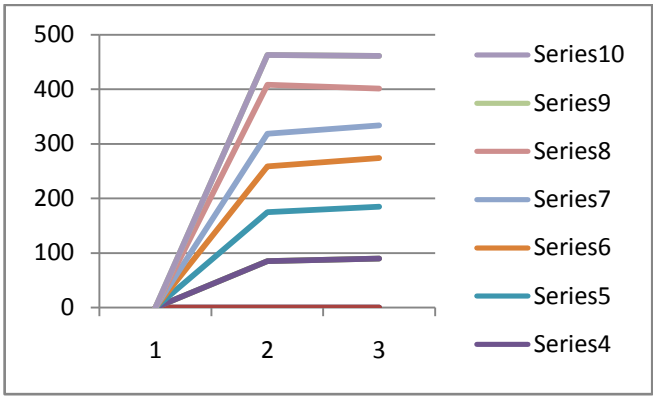

Fig 4: Accuracy graph

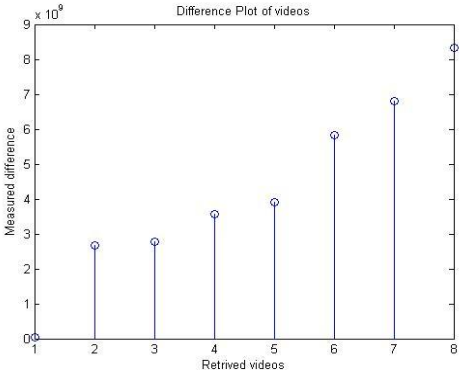

Fig 5: Difference graph

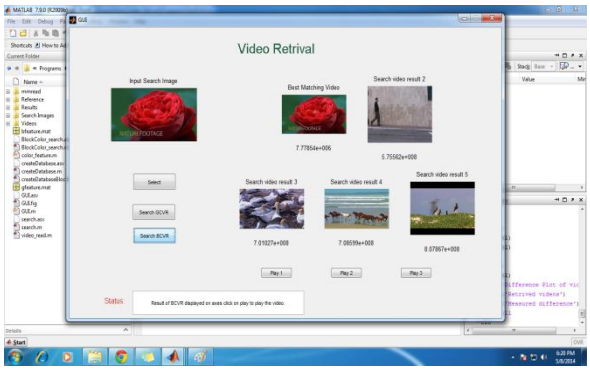

Fig 6: GUI Block Color Based Retrieval

6. APPLICATIONS

Especially CBVR is used in supercomputers and mainframe computers, because they need high computation time. Also In professional and educational activities for example on university website we can generate large volumes of video and multimedia data or notes of subjects for taking advantage of video-content analysis techniques. Easy access to educational material the availability of large multimedia libraries that we can efficiently search has a strong impact on education [2].Automated authoring of web content media organizations and TV broadcasting companies have shown considerable interest in presenting their information on the web. Intelligent video segmentation and sampling techniques can reduce the visual contents of the video program to a small number of static images. Consumer domain applications**,** video content analysis research are geared toward large video archives. However, the widest audience for video and image content analysis is consumers. We all have video or image content through broadcast TV and cable. To capture the consumer's view, the management of video information in the home entertainment area will require sophisticated yet feasible techniques for analyzing, filtering, and browsing video by content. Similarity based search we can use for web based applications [3].

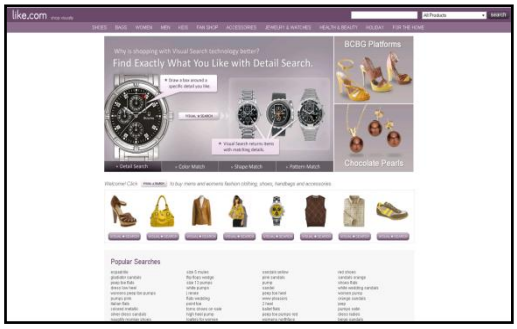

Fig 7: Example of Sample Application

7. FUTURE SCOPE

Video indexing and retrieval in the cloud computing Environment, where the individual videos are to be searched and the dataset of videos are both changing dynamically, it will form a new research direction in video retrieval in the very near future. Video affective semantics describe human psycho feelings such as romance, pleasure, violence, sadness, and anger. Content based video retrieval is maturing to the point where it can be used in real world problem retrieval practices. One great practice is audiovisual archive whose users increasingly require well particle access to broadcast television content. In this video retrieval community will be described with transcript based search, low level feature based search and detector based search. Content based analysis and video/image retrieval methods have been evaluated extensively in TRECVID evaluation methodology used to evaluate the potential impact of CBVR in audiovisual archive [9].

Interactive Multiuser Video Retrieval:

A web based video search system with video streaming delivery to search videos obtained from PowerPoint presentations using the associated metadata online and offline. A mobile video browsing and retrieval applications based on HTML and JavaScript gives an interactive video browsing like a tool for supporting content management and selection in post invention has been presented, comparing the usability of full featured desktop applications and with a limited web based interface. We can use multitouch interface for multimedia retrieval that contains one shared display which provides group members with a shared context and focus of attention, supporting collocated cooperative work known as single display groupware SPG.

8. CONCLUSION

Content based image retrieval methods are used for reduction of the semantic gap as much as possible, sometimes reduction the sensorial gap as well in the process. In this paper content based video retrieval has new techniques as it can be used with different phases and also we can make it as a web based for the search engine experiments. Content based image and video retrieval can be implemented with the different similarity measures with its types using different color spaces specifically with the HSV color spaces. Performance of content based video retrieval can be increased with reduction in computation time. Hence color-based retrieval has been the strength for content-based image and video retrieval compared with the other methods like shape or texture.

9. REFERENCES

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