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Content Based Image Retrieval Based on Color and Texture Features

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ABSTRACT: In this paper, the algorithm for a novel image retrieval scheme to retrieve images is presented. We address the unique algorithm to extract the colour pixel features by the HSV colour space and the texture features of Mpeg-7 Edge Histogram Descriptor .The proposed scheme transfers each image to a quantized colour code using the regulations of the properties in compliance with HSV model and subsequently using the quantized colour code along with the texture feature of Edge Histogram Descriptor to compare the images of database. We succeed in transferring the image retrieval problem to quantized code comparison. Experimenting on two public datasets, the results show that the proposed methods can achieve up to 43.5% relative improvement in MAP compared to the existing methods. We will use lab feature extraction for to detect the color and to identify the texture using multi dimensional texture analysis then the edge orientation histogram is used for shape detection. We propose two orthogonal methods named attribute-enhanced sparse coding and attribute-embedded inverted indexing. Attribute-enhanced sparse coding exploits the global structure of feature space and uses several important human attributes combined with low-level features to construct semantic code words in the offline stage.

I. INTERODUCTION

MANY former schemes have been developed to improve the retrieval accuracy in the content-based image retrieval (CBIR) system. One type of them is to employ image features derived from the compressed data stream. As opposite to the classical approach that extracts an image descriptor from the original image, this retrieval scheme directly generates image features from the compressed stream without first performing the decoding process. This type of retrieval aims to reduce the time computation for feature extraction/generation since most of the multimedia images are already converted to compressed domain before they are recorded in any storage devices. In the image features are directly con-structed from the typical block truncation coding (BTC) or halftoning-based BTC compressed data stream without performing the decoding procedure. These image retrieval schemes involve two phases, indexing and searching, to retrieve a set of similar images from the database. The indexing phase extracts the image features from all of the images in the database which is later stored in database as feature vector. In the searching phase, the retrieval system derives the image features from an image submitted by a user (as query image), which are later utilized for performing similarity matching on the feature vectors stored in the data-base. The image retrieval system finally returns a set of images to the user with a specific similarity criterion, such as color similarity and texture similarity. The concept of the BTC [1] is to look for a simple set of representative vectors to replace the original images.

Specifically, the BTC compresses an image into a new domain by dividing the original image into multiple non overlapped image blocks, and each block is then represented with two extreme quantizers (i.e., high and low mean values) and bitmap image. Two subimages constructed by the two quantizers and the corresponding bitmap image are produced at the end of BTC encoding stage, which are later transmitted into the decoder module through the transmitter. To generate the bitmap image, the BTC scheme performs thresholding opera-tion using the mean value of eachimage block such that a pixel value greater than the mean value is regarded as 1 (white pixel) and vice versa. The traditional BTC method does not improve the image quality or compression ratio compared with JPEG or JPEG 2000. However, the BTC schemes achieves much lower computational complexity compared with that of these techniques. Some attempts have been addressed to improve the BTC reconstructed image quality and compression ratio, and also to reduce the time computation.

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II. LITERATURE SURVAY

EFFICIENT FACE IMAGE RETRIEVAL THROUGH DCT FEATURES

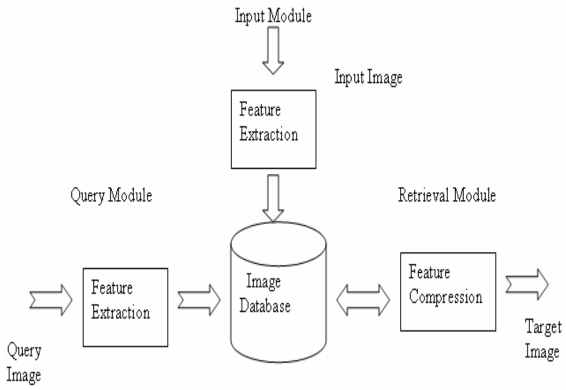
This paper proposes a new simple method of DCT feature extraction that utilize to accelerate the speed and decrease storage needed in image retrieving process by the aim of direct content access and extraction from JPEG compressed domain. Our method extracts the average of some DCT block coefficients. This method needs only a vector of six coefficients per block over the whole image blocks In our retrieval system, for simplicity, an image of both query and database are normalized and resized from the original database based on the cantered position of the eyes, the normalized image equally divided into non overlapping 8X8 block pixel Therefore, each of which are associated with a feature vector derived directly from discrete cosine transform DCT. Users can select any query as the main theme of the query image. The retrieval images is the relevance between a query image and any database image, the relevance similarity is ranked according to the closest similar measures computed by the Euclidean distance. The experimental results show that our approach is easy to identify main objects and reduce the influence of background in the image, and thus improve the performance of image retrieval. A **discrete cosine transform** (**DCT**) expresses a finite sequence of data points in terms of a sum of cosine functions oscillating at different frequencies. The use of cosine rather than sine functions is critical in these applications: for compression, it turns out that cosine functions are much more efficient (as described below, fewer functions are needed to approximate a typical signal), whereas for differential equations the cosines express a particular choice of boundary conditions. In particular, a DCT is a Fourier-related transform similar to the discrete Fourier transform (DFT), but using only real numbers. DCTs are equivalent to DFTs of roughly twice the length, operating on real data with even symmetry (since the Fourier transform of a real and even function is real and even), where in some variants the input and/or output data are shifted by half a sample. There are eight standard DCT variants, of which four are common. The most common variant of discrete cosine transform is the type-II DCT, which is often called simply "the DCT",[1][2] its inverse, the type-III DCT, is correspondingly often called simply "the inverse DCT" or "the IDCT". Two related transforms are the discrete sine transforms (DST), which is equivalent to a DFT of real and odd functions, and the modified discrete cosines transform (MDCT), which is based on a DCT of overlapping data.

JPEG: Discrete cosine transform

The DCT is used in JPEG image compression, MJPEG, MPEG, DV, Daala, and Theora video compression. There, the two-dimensional DCT-II of $N \times N$ blocks is computed and the results are quantized and entropy coded. In this case, N are typically 8 and the DCT-II formula is applied to each row and column of the block. The result is an 8 × 8 transform coefficient array in which the $(0,0)$ element (top-left) is the DC (zero-frequency) component and entries with increasing vertical and horizontal index values represent higher vertical and horizontal spatial frequencies.

Content based image retrieval (CBIR)

This paper proposed to Content based image retrieval (CBIR) is a hot topic research in the last decade. A number of image features based on color, texture, and shape attributes in various domains have been reported in the literature.



CBIR system can be classified as two phases: indexing and searching. In the indexing phase, each image of the database is represented by a set of attribute features color, texture and shape. In searching phase, when the user selects a query image, a query vector feature is computed. Using similarity distance measure well know Euclidian distance, the query vector compared to the feature vectors in the feature database and retrieve to the user the images that most close or similar to the query image. In the input module, the feature vector is extracted from input image. It is then stored along with its input image in the image database. On the other hand, when a query image enters the query module, it extracts the feature vector of the query image. In the retrieval module, the extracted feature vector is

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compared to the feature vectors stored in the image database. As a result of query, the similar images are retrieved according to their closest matching scores. Finally, the target image will be obtained from the retrieved images.

III. SYSTEM ANALYSIS

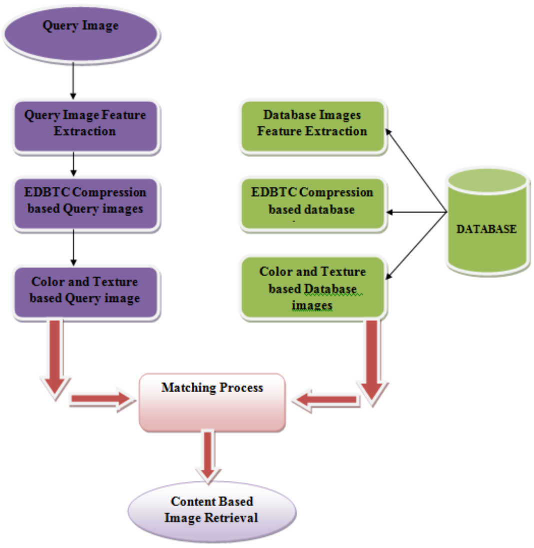
3.1 EXISTING SYSTEM

A large portion of photos shared by users on the Internet are various images. Some of these images are tagged with names, but many of them are not tagged properly. Existing systems ignore strong, content-specific geometric constraints among different visual words in a image. In this method cannot retrieve the large scale content based image. The reason of choosing the extreme values to represent an image block is to generate a dithered result (bit pattern illusion) to reduce the annoying blocking effect or false contour inherently existing in BTC images. These features are typically high dimensional and global, thus not suitable for quantization and inverted indexing. In other words, using such global features in a retrieval system requires essentially a linear scan of the whole database in order to process a query, which is prohibitive for a web scale image database.

3.2 PROPOSED SYSTEM

The proposed image retrieval system extracts the image features from all images in the database using the proposed CHF and BHF EDBTC features. The proposed method outperforms the former existing CBIR methods under Corel 1000 and Corel 10 000 databases. We propose the EDBTC exploits the dithering property of the error diffusion to overcome the false contour problem normally occurred in BTC compression. We conducted an extensive set of experiments, in which encouraging results were obtained. Attribute-embedded inverted indexing locally considers image content of the designated query image in a binary signature and provides efficient retrieval in the online stage. There are two features employed in the proposed method to characterize the image content, namely, CHF and bit histogram feature.

3.3 ARCHITECTURE:



IV. SYSTEM IMPLEMENTATION

4.1. QUERY IMAGE SEARCH:

To select the query image from the data base. In that query image, no need to consider that image format and size. It will be help to support all type of image format. Finally that query image find out the extract result given it.

4. 2. EDBTC COMPRESSION BASED SEARCH:

This section presents a review of the EDBTC with its extension to color image compression. The EDBTC com-presses an image in an effective way by incorporating the error diffusion kernel to generate a bitmap image. Simultaneously, it produces two extreme quantizers, namely, minimum and maximum quantizers. The EDBTC scheme offers a great advantage in its low computational complexity in the bitmap image and two extreme quantizers generation. In addition, EDBTC scheme produces better image quality compared with the classical BTC approaches.

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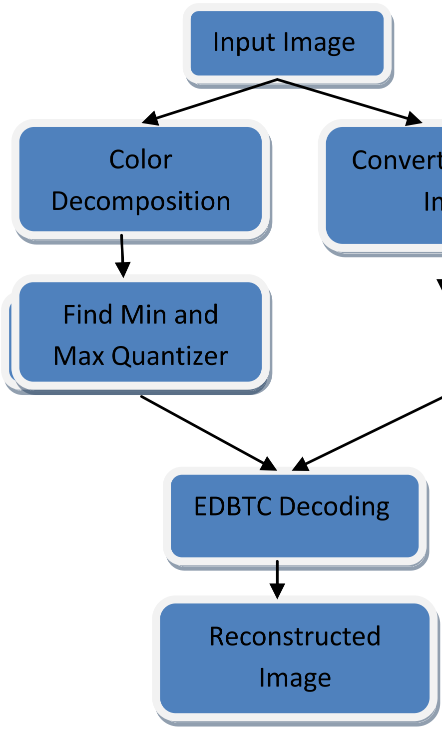
The detail explanation and com-parison between EDBTC and BTC-based image compression can be found. BTC and EDBTC have the same characteristic in which the bitmap image and the two extreme values are produced at the end of the encoding stage. In BTC scheme, the two quantizers and its image bitmap are produced by computing the first moment, second moment, and variance value causing a high computational burden.



4.3. COLOR BASED IMAGE SEARCH

Several methods for retrieving images on the basis of color similarity have been described in the literature, but most are variations on the same basic idea. Each image added to the collection is analyzed to compute a color histogram which shows the proportion of pixels of each color within the image. The color histogram for each image is then stored in the database. At search time, the user can either specify the desired proportion of each color (75% olive green and 25% red, for example), or submit an example image from which a color histogram is calculated. Either way, the matching process then retrieves those images whose color histograms match those of the query most closely

- Problems with color variances
  - Surface Orientation
  - Camera Viewpoint
  - Position of Illumination
  - Intensity of the Light]

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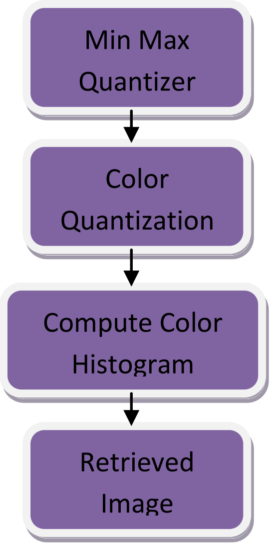

4.4 COLOR HISTOGRAMS

The color histograms are used to represent the color distribution in an image. Mainly, the color histogram approach counts the number of occurrences of each unique color on a sample image. Since an image is composed of pixels and each pixel has a color, the color histogram of an image can be computed easily by visiting every pixel once. By examining the color histogram of an image, the colors existing on the image can be identified with their corresponding areas as the number of pixels. Histogram search characterizes an image by its color distribution, or histogram. Many histogram distances have been used to define the similarity of two color histogram representations.

4.5 TEXTURE BASED IMAGE SEARCH

The ability to retrieve images on the basis of texture similarity may not seem very useful. But the ability to match on texture similarity can often be useful in distinguishing between areas of images with similar color (such as sky and sea, or leaves and grass). A variety of techniques has been used for measuring texture similarity; the best-established rely on comparing values of what are known as second order statistics calculated from query and stored images. Essentially, these calculate the relative brightness of selected pairs of pixels from each image. From these it is possible to calculate measures of image texture such as the degree of contrast, coarseness, directionality and regularity, or periodicity, directionality and randomness.

4.6 SHAPE BASED RETRIEVAL

The ability to retrieve by shape is perhaps the most obvious requirement at the primitive level. Unlike texture, shape is a fairly well-defined concept – and there is considerable evidence that natural objects are primarily recognized by their shape. A number of features characteristic of object shape (but independent of size or orientation) are computed for every object identified within each stored image. Queries are then answered by computing the same set of features for the query image, and retrieving those stored images whose features most closely match those of the query. Two main types of shape feature are commonly used – global features such as aspect ratio, circularity and moment invariants and local features such as sets of consecutive boundary segments. Alternative methods proposed for shape matching have included elastic deformation of templates, comparison of directional histograms of edges extracted from the image, and shocks, skeletal representations of object shape that can be compared using graph matching techniques. Queries to shape retrieval systems are formulated either by identifying an example image to act as the query, or as a user-drawn sketch.

Shape matching of three-dimensional objects is a more challenging task – particularly where only a single 2-D view of the object in question is available. While no general solution to this problem is possible, some useful inroads have been made into the problem of identifying at least some instances of a given object from different viewpoints. One approach has been to build up a set of plausible 3-D models from the available 2-D image, and match them with other models in the database. Another is to generate a series of alternative 2-D views of each database object, each of which is matched with the query image. Related research issues in this area include defining 3-D shape similarity measures, and providing a means for users to formulate 3-D shape queries.

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V. CONCLUSION

In this paper, a CBIR method has been proposed which uses the combination of dominant color, GLCM texture and canny edge detection for shape. A total of 39 features covering color, texture and shape proved that the proposed method yielded higher average precision and average recall. In addition the proposed method almost always showed performance gain of average retrieval time over the other methods. As further studies, the proposed retrieval method is to be evaluated for more various databases.

VI. FUTURE WORK

Database for image retrieval generally contains high dimensional and contiguous value data. Finding an index structure which allows efficient searching of an image database is still a problem under research. Index structures for text retrieval are not useful for image retrieval application. Thus we need to come up with an efficient indexing scheme to yield fast search of image database.

REFERENCES

1. Zhong Wu Tsinghua Univ., Ctr Adv Study " Scalable Face Image Retrieval with Identity-Based Quantization and Multi-Reference Re-ranking," Asia Lab,2012.
2. C.P.Town AT&TLaboratoriesCambridge "Content Based Image Retrieval using Semantic Visual Categories", Cambridge,England-2012.
3. Behjat Siddiquie University of Maryland, College Park" Image Ranking and Retrieval based on Multi-Attribute Queries" -2012.
4. Y.-H. Lei, Y.-Y. Chen, L. Iida, B.-C. Chen, H.-H. Su, and W. H. Hsu, "Photo search by face positions and facial attributes on touch devices," ACM Multimedia, 2011.
5. D. Wang, S. C. Hoi, Y. He, and J. Zhu, "Retrieval-based face annotation by weak label regularized local coordinate coding," ACM Multimedia, 2011.

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