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A User Oriented Image Retrieval System using Halftoning BBTC

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***Abstract*—** The objective of this paper is to develop a system for content based image retrieval (CBIR) by accomplishing the benefits of low complexity Ordered Dither Block Truncation Coding based on half toning technique for the generation of image content descriptor. In the encoding step ODBTC compresses an image block into corresponding quantizes and bitmap image. Two image features are proposed to index an image namely co-occurrence features and bitmap patterns which are generated using ODBTC encoded data streams without performing the decoding process. The CCF and BPF of an image are simply derived from the two quantizes and bitmap respectively by including visual codebooks. The proposed system based on block truncation coding image retrieval method is not only convenient for an image compression but it also satisfy the demands of users by offering effective descriptor to index images in CBIR system.

Keywords-*Block Truncation Coding , Content Based Image Retrieval System,Ordered Dither Block Truncation Coding,Color Co-occurance Feature , Bit Pattern Feature.*

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I. INTRODUCTION

A User Oriented Image Retrieval System is content based image retrieval system where an input can be a text query or an image and the output may be either an image or a set of parameters related to the image. An image retrieval system is a system which allows us to browse, search and retrieve the images. Content Based Image Retrieval is the process of retrieving the desired query image from a huge number of databases based on the contents of the image. Color, texture, shape and local features are some of the general techniques used for retrieving a particular image from the images in the database. Content Based Image Retrieval systems works with all the images and the search is based on comparison of features with the query image. The main components of CBIR are the features which includes the Geometric shape, colors and the texture of the image. Features can be of two types like local features and global features. Object recognition can be done easily using the local features. The next component is the associated text in which the images can also be retrieved using the text associated with the image. The other component is the relevant feedback where it helps to be more precise in searching the relevant images by taking up the feedbacks of the user. Biomedicine, Military, Education, Web image classification and searching are some of the areas where the CBIR technique finds its prime importance. Some of the examples for the current CBIR are Viper which is Visual Information Processing for Enhanced Retrieval, QBIC which is Query by Image Content and Visual seek which is a web tool for searching images and videos. CBIR mainly decreases the heavy workload an overcomes the problem of heavy subjectivity. Images can be compared by forming the CCM (Color Co-occurrence Matrix) for the query image as well as the images in the database. For this the Hue Saturation Value is obtained for each and every pixel of the image and the CCM is formed using the relevant formulas. This CCM of the query image is compared with those images in database and the resulting images are sorted based on the similarity. This method can increase the accuracy and helps the user to obtain the results quickly.

II. CONTENT BASED IMAGE RETRIEVA

In early days because of very large image collections the manual annotation approach was more difficult. In order to overcome these difficulties Content Based Image Retrieval (CBIR) was introduced. Content-based image retrieval (CBIR) is the application of computer vision to the image retrieval problem. In this approach instead of being manually annotated by textual keywords, images would be indexed using their own visual contents .The visual contents may be color, texture and shape. This approach is said to be a general framework of image retrieval .There are three fundamental bases for Content Based Image Retrieval which are visual feature extraction, multidimensional indexing and retrieval system design. The color aspect can be achieved by the techniques like averaging and histograms. The texture aspect can be achieved by using transforms or vector quantization .The shape aspect can be achieved by using gradient operators or morphological operators. Some of the major areas of application are Art collections, Medical diagnosis, Crime prevention, Military, Intellectual property, Architectural and engineering design and

Geographical information and Remote sensing systems. CBIR involves the subsequent four parts in system realization, data collection, build up feature database, search in the database, arrange the order and deal with the results of the retrieval

1) Data gathering:-By using Internet spider program that can collect webs automatically to interview Internet and do the gathering of the images on the web site, then it will go over all the other webs through the URL, repeating this process and collecting all the images it has reviewed into the server.

2) Extract feature database:-Using index system program do analysis for the collected images and extract the feature information. At this time, the features that use widely involve low-level features such as color, texture and so on, the middle-level features such as shape.

3) Searching in the Database:-System extract the feature of image that waits for search when user input *the image sample that need search, then the search engine will search the suitable feature from the database and calculate the similar distance, then find some related webs and images with the lowest similar distance.*

4) Process and index the results:-Index the image obtained from searching due to the similarity of features, and then returns the retrieval images to the user and allow the user select. If the user is not pleased with the searching result, he can retrieval the image again, and searches database again.

III. LITERATURE SURVEY

A. *Existing System*

SYSTEM1:
Dr.Sanjay Silakari, Dr.Mahesh Motwani, Proposed the System Color Image Clustering using Block Truncation Algorithm [11].

METHOD:
The image database containing raw image data cannot be directly used for retrieval. Raw image data need to be processed and descriptions based on the properties.The strategy for earlier image retrieval system focused on "search-by-query". The user provides an example image for the query, for which the database is searched exhaustively for images that are most similar.
Clustering is a method of grouping data objects into different groups, such that similar data objects belong to the same group and dissimilar data objects to different clusters.

Image clustering consists of two steps:

1. The former is feature extraction
2. Grouping.

For each image in a database, a feature vector capturing certain essential properties of the image is computed and stored in a feature base. Clustering algorithm is applied over this extracted feature to form the group. In this paper we use a data mining approach to cluster the images based on color feature. Concept of color moment is extended to obtain the features and k-means algorithm is applied to cluster the images.

ADVANTAGES:
Low-level features are extracted directly from digital representations of the image and do not necessarily match the human perception of visual semantics.

SYSTEM2:
Ramanpreet Kaur, Sukhpreet Kaur Proposed the system Enhancement of Colored Images in Digital Image Processing. [14]

METHOD:
Image mining is the process of searching and discovering the data from database. Enhancement of colored images is based on the visual content of the Image. Desirable features can be extracted based on the visual content of the Image. Color, texture, pattern, image topology, shape of objects and their layouts and locations within the image, etc are the basis of the Visual Content of the Image and they indexed.
Generic Feature Extraction for Classification Using Fuzzy C Means Clustering. The raw data was pre-processed, normalized and then data points are clustered using Fuzzy C means technique.
Feature vectors for all the classes are generated by extracting the most relevant features from the corresponding clusters and used for further classification. An important observation was that the classification accuracy is obtained using Fuzzy C-Means clustering for generic feature extraction was very close to the accuracy of classification obtained by using problem-specific feature extraction .
Proposed Image Feature Extraction Techniques, Each of the features was represented using one or more feature descriptors. During the retrieval of image the, features and descriptors of the query were compared to those of the images in the database in order to rank each indexed image according to its distance to the query.
The candidate's patterns were then retrieved from database by comparing the distance of their feature vectors. Content based image retrieval is a technology which helps to organize digital pictures archives by their visual content, by this definition anything ranging from image similarity function to a robust image annotation engine falls under the purview of Content basedimage retrieval.

SYSTEM3:
The Authors Subarna Dutta,Aditya Abhinav, Partha Dutta, Purushottam Kumar ,Amiya HalderProposed the system An Efficient Image Compression Algorithm Based on Histogram Based Block Optimization and Arithmetic Coding. [5]

METHOD:
In this system, an efficient algorithm has been proposed for lossy image compression/decompression scheme using histogram based block optimization and arithmetic coding.
In an image there is usually a likelihood of high correlation between pixels. Such correlations between pixels or a block of pixels are exploited to achieve image compression. In this paper, M×N image is considered- that is, there are M number of rows each containing N pixel values. The basic approach in block optimization is for each block in the image one modified pixel value is generated and is stored in compressed file leading to compression. But the drawback of this method is some amount of data loss in the decompressed file.

The proposed algorithm mitigated this loss to some extent by taking histogram based block optimization. This methodology takes a block under consideration and draws a histogram of the block. Histogram gives the total no. of pixels assigned to each gray level. Then the peak of the histogram is found out. This peak represents the pixel value that is repeated maximum number of times in the block. This pixel value is then stored for the block in compressed file leading to compression as well as reduced loss while decompression as compared to averaging based block optimization.

ADVANTAGES:

1. The main advantage of histogram based block optimization is that it leads to less data loss while decompression is achieved.

SYSTEM 4:

Author H .B KekreImplements the system as Image Classification using Block Truncation Coding with Assorted Color Spaces. [9]

METHOD:

The paper portrays comprehensive performance comparison of image classification techniques using block truncation coding (BTC) with assorted color spaces. Overall six color spaces have been explored which includes RGB color space for applying BTC to figure out the feature vector in Content Based Image Classification (CBIC) techniques.

The results explicitly reveal performance improvement (higher average success rate values) with proposed color-BTC methods with luminance chromaticity color spaces compared to RGB color space. Best result is shown by YUV color space based BTC in content based image classification.

Image classification techniques can be used to classify the total number of image content in a database into limited number of major classes. Image classification and categorization is essential to speed up the image retrieval process.

ADVANTAGES:

1. Image classification demands increasing imporatance in fields like pattern recognition, content based image retrieval, security, media andjournalism.

2. It has been conferred from the results that the luminancechromaticity color spaces perform better in terms of classification.
3. The YUV color space gives the best performance followed by YCbCr color space among all the other color spaces used in the approach.

DISADVANTAGES:

Excessive amount of irrelevant record in a database leads to complicated and time consuming search of image data in it.

SYSTEM5:

An Adaptive Block Truncation Coding Scheme and Its Data-Driven Parallel Implementation. [12]

Method:

The proposed coding algorithm is based upon the absolute moment block truncation coding (AMBTC). AMBTC calculates the mean of each block and then performs a two level quantization .In order to improve the image quality; a AMBTC-based coding scheme has been described. First of all, in order to derive a better trade off between reconstructed quality and computational complexity, the proposed scheme introduces a three level classification technique. Compared to the previous two-level classification technique the proposed three level classification technique enables more adaptability in encoding/decoding an image. Moreover, to further improve the compression efficiency, differential pulse coding modulation (DPCM) is employed in the current scheme.

In this system, the image quality is evaluated in terms of the mean squared error (MSE) between the reconstructed luminance values and its original ones by virtue of the existing peak-signal-to-noise (PSNR) metric. Good reconstructed images typically have PSNR values of more than 30 dB.

DPCM is utilized to remove the redundant information existing in neighbouring block images within an identical image.

SYSTEM6:

The Authors Riyaz Ahmad Dar, M. MeseProposed the system as A Review of Block Truncation Coding Using Digital Halftoning **[7]**

METHOD:

Block Truncation Coding (BTC) is a lossy image compression technique which uses moment preserving quantization method for compressing digital gray scale images. Block truncation coding is a lossy type of image compression. In block truncation coding (BTC), the original image is divided into fixed-size non overlapping blocks of size M×N. The block size chosen is usually small to avoid the edge blurring and blocking effect. Each block is independently coded using a two level (1-bit) quantizer.The two values preserve the first and the second moment characteristic of the original block. BTC does not provide a higher gain than any of the modern image compressing algorithms like JPEG or JPEG-2000, but it is much lesser complex.

BLOCK TRUNCATION CODING USING DIGITAL HALFTONING:

This system used the error diffusion techniques. Error diffusion enjoys the benefit of diffusing the quantised error into the neighbouring pixels. The error diffusion can effectively diffuse the error between the neighboring pixels and then maintains the average grayscale in a local region.

This system used the void and cluster dithering approach. Using the void-and-cluster halftoning, the image quality is improved when operated in high coding gain applications.

The dither array in order dithering is employed to substitute the fixed average threshold in BTC, and the extreme pixel values in a block are adopted to substitute the high mean and low mean.

SYSTEM7:

Kartik Sau, Ratan Kumar Basak, presents the Image Compression based on Block Truncation Coding using Clifford Algebra. [4]

METHOD:
The present work investigates image compression based on Absolute Moment Block Truncation Coding (AMBTC) and Clifford Algebra here. In this method we gives a positive integer values as the sum of large perfect square of positive integer.

The largest square is computed from the given integer, and then the same process is repeated from the residual part of the integer successively. The proposed method gives very good performance in terms of PSNR values when compared to the conventional BTC and AMBTC. To assess image quality some parametric measures bring into service such as: Peak Signal to Noise Ratio (PSNR), Weighted Peak Signal to Noise Ratio (WPSNR), Bit Rate (BR) etc Clifford algebra contains some steps as follows:

Step 1)Size of image in pixels is divided into sub images.
Step 2) Calculate average gray level. It having real numbers, complex numbers, quaternion number & other.
Step 3)then it classified into two ranges of values.
Step 4)Pixel values are quantized to 0 otherwise 1.
Steps 5) blockmatrix (B) send to each block.
Step 6)each image block is deduced by coping 1.

ADVANTAGES:
- Advantages of this method arealgebraicallyseparating colors which are handled from geometric operation done to them.
- It used to define color alteration with algebraicoperation.
- Its advantages are simplicity, Fault tolerance, High compression efficiency and good image quality of decoded image.

DISADVANTAGES:
- Clifford algebra achieves its simple structure by presenting subspaces.
- It gets simple operation but more involved object.
- Clifford algebra needs 2^n number to be specified.

SYSTEM8:
Riyaz Ahmad Dar**,** D .K. Knuthdescribed the system titled as A review of block truncation coding using digital halftoning.[22]

METHOD:
In this method we are use halftoning algorithm to improve the computational complexity, compression ratio and image quality of BTC.It use the error deffusion technique. It cans deffuse the error between near pixel. Error deffusion used to convert a multi-level image into binary image. In this method we used void and cluster dithering approach using this image quality is improved.
Dot deffusion algorithm is similar to tradition BTC algorithm.
It has two differences:
1) High mean and low mean are replaced by X_{max} and X_{min} in a block.
2) The bitmap generation is done using dot deffusion halftoning.

ADVANTAGES:
- Provide an excellent image quality and artifact free result.
- The performance can be attributed to parallel processing of the block in the dot deffusion.
- The method is extremely fast and the image quality achieved is comperable to the best method.

DISADVANTAGES:
The drawback of digital halftoning is the production of occasional glitches in an otherwise uniform area.

SYSTEM9:
The AutherD.Harihara Santosh ProposedAbsolute Moment Block Truncation Coding For Colour Image Compression.[6]

METHOD:
In this paper color image data compression using AMBTC is developed. This technique decreases the computational complexity and achieves the minimum mean square error and PSNR.
Image data compression is the minimization of the number of information carrying units used to represent an image. It is classifying into two types that is:
1) Lossy compression technique
2) Lossless compression technique
In lossy compression technique message can never be recovered.In lossless compression technique original message can be exactly decoded.

BLOCK TRUNCATION CODING:
It achieves constant bit rate of 2.0 bits per pixel. It divides the original images into small sub-images and then using a quantizer, which adapts itself according to the image statistics, to reduce the number of grays.
In block truncation coding an image is firstly segmented into n x n blocks of pixels.

QUAD FREE SEGMENTATION:
The quad tree segmentation technique divides the given image in to set of variable sized blocks using a threshold value.

ADVANTAGES:
It has the advantages of preserving single pixel and edges having low computational complexity.

DISADVANTAGES:
The need for an efficient technique for compression of images ever increasing because the raw images need large amount of disk space seems to be a big disadvantage during transmission and storage.

SYSTEM10:
Author Zhi-Wei Zhang, Ming-Hui Wangproposed Color image

retrieval using extended fast VQ codeword search technique and vector composition based feedback .[3]

METHOD

The paper present a novel fast image retrieval algorithm based on extended fast VQ code word search technique to improve the efficiency of the content based image retrieval system. Itreduces the retrieval time without decreasing accuracyof retrieving the first K most similar images. In this method Gaussian normalization technique is used.

The main idea of VQ is to divide an image into blocks and then encode them vector by vector using indices of their nearest codewordsinpredesigned codebooks, vector quantization is the origin of fast codewordsearch algorithm.

VECTOR QUANTIZATION:

It is block based image encoding technique. VQ generate a representative codebook from a training set consisting a number of training vectors. The encoded image first divided into non-overlapping n-dimensional vector.

GUASSIAN NORMALIZATION:

This is used to normalize each component into same range (-1, 1).

ADVANTAGES:

This scheme can be directly used to many websites for image search to speed up the search speed.

DISADVANTAGES:

It needs color conversion matrix.

IV. SYSTEM ARCHITECTURE

Content-based image retrieval is an application of computer vision, used to retrieve images from the large database."Content-based" means that the search analyzes the contents of the image rather than the metadata such as keywords, tags, or descriptions associated with the image. The term "content" in this context might refer to colors, shapes, textures, or any other information that can be derived from the image itself.Fig.1. Shows architecture for content-based image retrieval. The general architecture of CBIR system is shown in figure. Features are extracted from individual images and stored in the feature database. There are various types of like color, texture, shape, region or spatial features or some compressed domain features. The extracted features are described by feature vectors. This feature vectors are then stored to form image feature database. Extract the features of query image and form a feature vector for the corresponding image.. This feature vector is matched with the already stored vectors in image feature database. Sometimes dimensionality reduction techniques are employed to reduce the computations. The distance between the feature vector of the query image and those of the images in the database is then calculated. The distance of a query image with itself is zero if it is in database. The distances are then stored in increasing order and retrieval is performed with the help of indexing scheme.

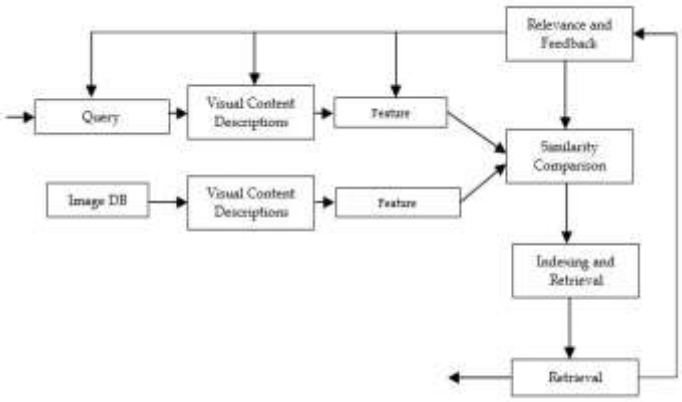


Figure 1. Architecture of Image Retrieval system

V. SYSTEM MODULES

The System is divided into 5 Modules:

A. Data Base Module.
B. Index Module.
C. Image Search Module.
D. Image Retrieval Module.
E. Analysis Module.
F. User Interface Module.

A. Data Base Module:

This Module maintains database as collection of images. The image feature database is Organized collection of image features of corresponding images of image database. The corresponding interface provides accessibility to image feature database.

B. Index Module:

This Module used to create Index structure On data base of images.

C. Image Search Module:

This Module used to search similar images based on Query Image."Plain" Search Module Publish the search module or create a new module if there is no search module present in the list of modules. Extensions->Module Manager->New->Search; Fill in a title and select position-4 (base template Joomla 3) or another position you prefer. In our example there is already a module on position-4, the Language Switcher. If you also are creating a Multi-Language website you have now 2 modules on this position. For this example we have set the default options, except: Search Button: Yes,
Button Position: right,
Search Button Image: No,
Button text: Search.
Save the module.

D. Image Retrieval Module:

This Module used to retrieve similar images based on Query Image. The extracted features of the query image are compared with the stored image features of the feature database by applying similarity criterions for retrieving content- -images. Based On Color codes of entire image.
Foreground color codes
Foreground shape correlation

Combination of foreground color codes and shape correlation selectable percentage proportion of weight of foreground color codes and foreground shape correlation for composition similarity measure. Similar face –images containing complex background.

E . Analysis Module:

This Module compares the performance results on searching the image with index and without index.

F. User Interface Module:

This Module develops user interfaces for various operations.

VI. MATHEMATICAL MODEL

Given an original RGB color image of size $M \times N$. This image is firstly divided into multiple non-overlapping image blocks of size $m \times n$, and each image block can be Processed independently. Fig. 1 shows the conceptual block diagram of the ODBTC encoding for a color image. Let

$B = \{b(i, j)\ ; i = 1, 2, \ldots, M/m\ ;\ j = 1, 2, \ldots, N/n\}$ be a set of image blocks of size $m \times n$, containing the RGB color pixel information. The original image block $b(i, j)$ is firstly converted into the inter-band average image $\bar{b}k,l\ (i, j)$ by

$k = 1, 2, \ldots, m;\ l = 1, 2, \ldots, n,$ (1)

Where (k, l) denotes the pixel coordinate on image block (i, j).

$$\bar{b}_{k,l}(i,j) = 1/3\ [b_{k,l}^{red}(i,j) + b_{k,l}^{green}(I,j) + b_{k,l}^{blue}(I,j)];$$

K= 1,2,3,……..m;

L=1,2,…….n;

(1)

Where (k, l) denotes the pixel coordinate on image block (i, j).The inter-band average computation is applied to all image blocks.

The ODBTC employs the void-and-cluster dither array of the same size as an image block to generate the bitmap image. Let $D(k, l)$ denotes the dither array coefficient at position (k, l), where $k = 1, 2, \ldots, m$ and $l = 1, 2, \ldots, n$. Let $D = \{D0, D1, \ldots, D255\}$ be a set of scaled version of dither array which can be easily computed as

$D^d(k, l) = d(D(k, l) - Dmin/Dmax - Dmin)$ (2)

Where $Dmin$ and $Dmax$ denote the minimum and maximum coefficient values in the dither array, respectively.

The set $D = \{D0D1, \ldots, D255\}$ can be off-line pre-calculated and stored as a Look-Up-Table (LUT) for later usage. Using this strategy, the computational time can be significantly reduced, making it suitable for the practical applications. The variable d denotes the dither array index in LUT, defined as $d = .bmax\ (i, j) - .bmin\ (i, j)$. Since $0 \le d \le 255$, it implies that all dither array coefficients $Dd\ (k, l)$ distribute in the range [0, 255]. The variables $.bmin\ (i, j)$ and $.b\ max\ (i, j)$ represent the minimum and maximum values, respectively, of the inter-band average image on image block (i, j). These two values can be computed as

$$\bar{b}_{min}(i,j) = \min \bar{b}_{k,l}(i,j) \ldots\ldots\ldots\ldots (3)$$

$$\bar{b}_{max}(i,j) = \max \bar{b}_{k,l}(i,j) \ldots\ldots\ldots\ldots (4)$$

The thresholding process for the pixels .

$bk,l\ (i, j)$ in each image block is given by

$bmk,l\ (i, j) = \{1;\ if\ .bk,l\ (i, j) \ge .bmin\ (i, j) + Dd\ (k,l),$

$0; if.bk,l(i,j) < .bmin(i,j) + Dd(k,l)\} \ldots\ldots\ldots (5)$

The set of minimum and maximum quantizers from all image blocks is given as

$Xmin = \{\ x_{min}(i, j);\ i = 1, 2, \ldots, M/m;\ j = 1, 2, \ldots, N/n\} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (6)

$Xmax = \{\ x_{max}\ (i, j);\ i = 1, 2, \ldots, M/m;\ j = 1, 2, \ldots, N/n,\} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots$ (7)

where $xmin(i, j)$ and $xmax\ (i, j)$ denote the minimum and maximum values, respectively, over red, green, and blue channels on the corresponding image block (i, j).

The RGB color space is employed in this paper, thus the minimum and maximum quantizers are also in the RGB color representation. The set of minimum and maximum quantizers from all image blocks is given as

$$X_{min} = \left\{ x_{min}(i,j);\ i = 1, 2, \ldots, \frac{M}{m};\ j = 1, 2, \ldots, \frac{N}{n}, \right\} \quad (6)$$

$$X_{max} = \left\{ x_{max}(i,j);\ i = 1, 2, \ldots, \frac{M}{m};\ j = 1, 2, \ldots, \frac{N}{n}, \right\} \quad (7)$$

where $xmin(i, j)$ and $xmax\ (i, j)$ denote the minimum and maximum values, respectively, over red, green, and blue channels on the corresponding image block (i, j). The two values can be formally formulated as

$$x_{min}(i,j) = \left[\min_{\forall k,l} b_{k,l}^{red}(i,j),\ \min_{\forall k,l} b_{k,l}^{green}(i,j),\ \min_{\forall k,l} b_{k,l}^{blue}(i,j) \right], \quad (8)$$

$$x_{max}(i,j) = \left[\max_{\forall k,l} b_{k,l}^{red}(i,j),\ \max_{\forall k,l} b_{k,l}^{green}(i,j),\ \max_{\forall k,l} b_{k,l}^{blue}(i,j) \right], \quad (9)$$

closest matching between the minimum quantize value of each image block $xmin(i, j)$ and the codebook $Cmin$ which meets the following condition.

$$\tilde{i}_{min}(i,j) = \arg\min_{q=1,2\ldots,N_C} \left\| x_{min}(i,j), c_q^{min} \right\|_2^2,$$

After performing the color indexing for minimum and maximum quantizes, the color co-occurrence matrix (i.e., Color Co-occurrence Features (CCF)) for a given image can be directly computed as

$$CCF(t_1,t_2)=\Pr\left\{\bar{i}_{min}(i,j)=t_1,\bar{i}_{max}(i,j)=t_2\middle|\ i=1,2,\ldots,\frac{M}{m};j=1,2,\ldots,\frac{N}{n}\right\},$$

The bitmap of each block *bm(i, j)* is simply indexed based on the similarity measurement between this bitmap and the codeword *Qq* which meets the following criterion. for all $i = 1, 2, \ldots, Mm$ and $j = 1, 2, \ldots, Nn$. The symbol $\delta H\{\cdot,\cdot\}$ denotes the Hamming distance between the two binary patterns (vectors), i.e., bitmap image *bm (i, j)* and bit pattern codeword *Qq* .

$$\bar{b}(i,j)=\arg\min_{q=1,2\ldots,Nb}\delta_H\{bm(i,j),Q_q\},$$

Subsequently, the BPF is simply derived as the occurrence probability of the bitmap image mapped into the a specific bit pattern codeword *Qq* . Thus, BPF is formally defined as

$$BPF(t)=\Pr\left\{\bar{b}(i,j)=t|i=1,2,\ldots,\frac{M}{m};j=1,2,\ldots,\frac{N}{n}\right\},$$

The feature dimensionality of the BPF is *Nb*, i.e., identical to the bit pattern codebook size.the similarity measurement between two images is defined as follows. where $\alpha 1$ and $\alpha 2$ denote the similarity weighting constants, representing thse percentage contributions of the CCF and BPF in the proposed image retrieval system. A small number ε is placed at the denominator to avoid the mathematic division error.

$$\delta(query,target)=\alpha_1\sum_{t=1}^{N_c}\frac{|CCF^{query}(t)-CCF^{target}(t)|}{CCF^{query}(t)+CCF^{target}(t)+\varepsilon}+\alpha_2\sum_{t=1}^{N_b}\frac{|BPF^{query}(t)-BPF^{target}(t)|}{BPF^{query}(t)+BPF^{target}(t)+\varepsilon},$$

the image retrieval performance are defined in [44] as below: where *L*, *Nt*, and *NR* denote the number of retrieved images, the number of images in database, and the number of relevant images on each class, respectively. The symbols *q* and *nq (L)*denote the query image and the number of correctly retrieved images among *L* retrieved images set, respectively.

$$P(q)=\frac{1}{N_tL}\sum_{q=1}^{N_t}n_q(L),$$

$$R(q)=\frac{1}{N_tN_R}\sum_{q=1}^{N_t}n_q(L),$$

VII. SYSTEM REQUIREMENTS

I. SOFTWARE REQUIREMENT

Operating System: Windows XP/7/8

Programming language: java

Software: Xampp Software .

II. HARDWARE REQUIREMENTS

Processor:
Minimum requirement: Dual Core
Recommended: Intel i series

Hard disk space: 25 GB min.

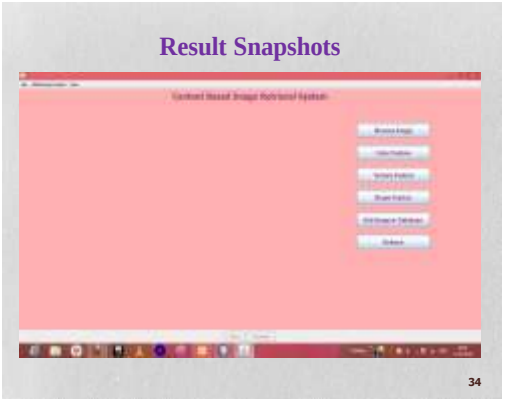
RAM: 2 GB min.

III. APPLICATIONS

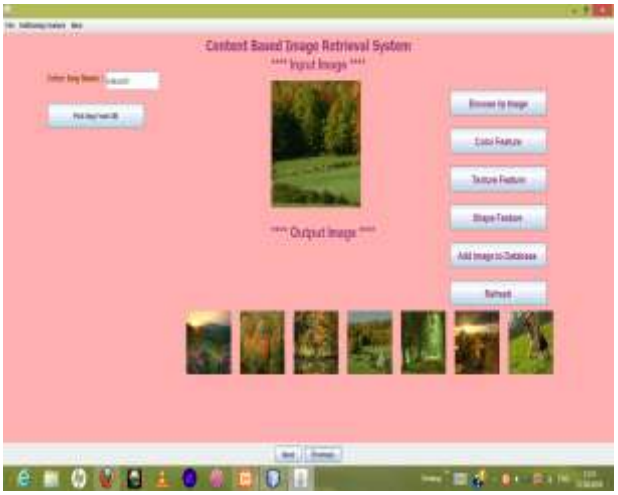
- Using in web search engine
- Fingerprint identification
- Biodiversity information systems
- Digital libraries
- Crime prevention
- Medicine
- Historical research

IV. RESULT SNAPSHOTS

Result of Image Search Module :



Result of Image Retrieval Module :



VIII . CONCLUSION

In the existing system different algorithm is used such as Image Compression Algorithm, Image Hiding Algorithm for Water making, Block Truncation Coding, Clifford algebra which is used to define color alteration , Block truncation Algorithm , Digital Image Processing , Block Optimization and Arithmetic coding based on Histogram , BTC with Assorted color space , Data-Driven parallel Implementation with BTC , VQ codeword search Technique. In proposed system, an image retrieval system is presented by exploiting the ODBTC encoded data stream to construct the image features, namely Color Co-occurrence and Bit Pattern features. As documented in the experimental results, the proposed scheme can provide the best average precision rate compared to various former schemes in the literature.
As a result, the proposed scheme can be considered as a very competitive candidate in color image retrieval application. Halftoning algorithm is easy and improves the performance of images as compared to other algorithms.

V. FUTURE SCOPE

The proposed image retrieval scheme can be applied to video retrieval. The video can be treated as sequence of image in which the proposed ODBTC indexing can be applied directly in this image sequence. The ODBTC indexing scheme can also be extended to another color space as opposed to the RGB triple space. In the future possibilities, the system shall be able to bridge the gap between explicit knowledge semantic, image content, and also the subjective criteria in a framework for human-oriented testing and assessment.

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REFERENCES

[1] Jing-Ming Guo, and Heri Prasetyo, "Content-Based Image Retrieval Using Features Extracted From Halftoning-Based Block Truncation Coding'' IEEE Transaction on Image Processing , Vol 24 , NO 3, March 2015.

[2] E. J. Delp and O. R. Mitchell, "Image compression using block truncation coding," *IEEE Trans. Commun.*, vol. 27, no. 9,pp. 1335–1342, Sep. 1979.s

[3] Y. Wu and D. C. Coll, "BTC-VQ-DCT hybrid coding of digital images," *IEEE Trans. Commun.*, vol. 39, no. 9, pp. 1283–1287,Sep. 1991.

[4] Lounesto P. *Clifford Algebras and Spinors*. Cambridge University Press, Cambridge, 1997.

[5] Y.-G. Wu and S.-C. Tai, "An efficient BTC image compression technique,"*IEEE Trans. Consum. Electron.*, vol. 44, no. 2, pp. 317–325,May 1998.

[6] M. Lema and O. R. Mitchell, "Absolute moment block truncation coding and its application to color images," *IEEE Trans. Commun.*, vol. 32,no. 10, pp. 1148–1157, Oct. 1984.

[7] M. Mese and P. P. Vaidyanathan, "Optimized halftoning using dot diffusion and methods for inverse halftoning," IEEE Trans. Image Processing, vol. 9, pp. 691–709, Apr. 2000.

[8] J.-M. Guo, "High efficiency ordered dither block truncation coding with dither array LUT and its scalable coding application," *Digit. Signal Process.*, vol. 20, no. 1, pp. 97–110, Jan. 2010.

[9] H. B . kekre , Tanuja K. sarode , Sudeep D. Thepade, shricant sanas ," Assorted colour spaces to improve the Images Retrieval using VQ Codebooks Generated using LBG and KEVR, In Springer Int. conference on Technology systems ang Management(ICTSM), 2011.

[10] G. Qiu, "Color image indexing using BTC," *IEEE Trans. Image Process.*,vol. 12, no. 1, pp. 93–101, Jan. 2003.

[11]] M. R. Gahroudi and M. R. Sarshar, "Image retrieval based on texture and color method in BTC-VQ compressed domain," in *Proc. 9th Int.Symp. Signal Process. Appl.*, Feb. 2007, pp. 1–4.

[12] S. Silakari, M. Motwani, and M. Maheshwari, "Color image clustering using block truncation algorithm," *Int. J. Comput. Sci. Issues*, vol. 4, no. 2, pp. 31–35, 2009.

[13] C.-C. Lai and Y.-C. Chen, "A user-oriented image retrieval system based on interactive genetic algorithm," *IEEE Trans. Instrum. Meas.*, vol. 60, no. 10, pp. 3318–3325, Oct. 2011.

[14] Z.-M. Lu and H. Burkhardt, "Color image retrieval based on DCTdomain vector quantization index histograms," *Electron. Lett.*, vol. 41, no. 17, pp. 956–957, 2005.

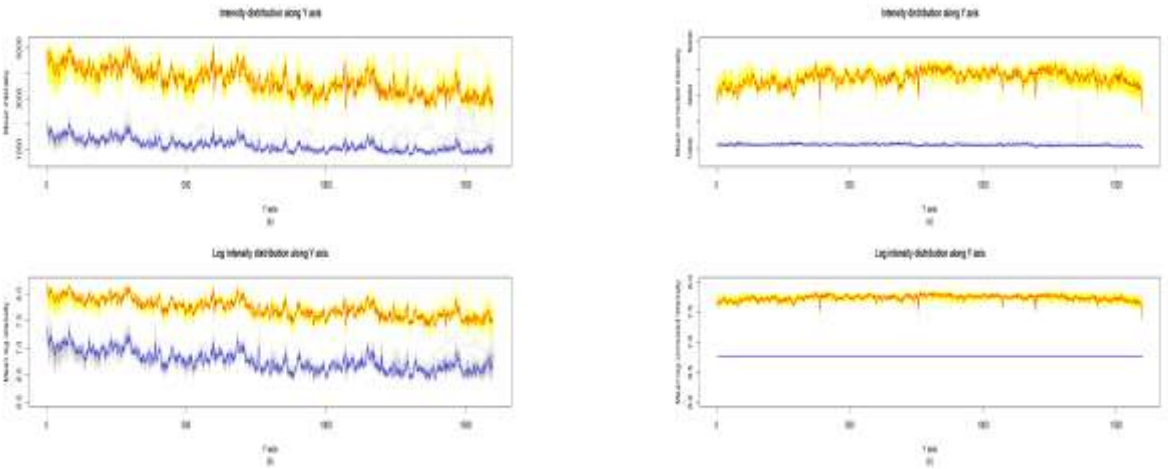

Figure 1. Example of a TWO-COLUMN figure caption: (a) this is the format for referencing p