

## CONTENT BASED IMAGE RETRIEVAL USING TEXTURE, EDGE ORIENTATION AND COLOUR HISTOGRAM

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### Abstract:

Content-Based Image Retrieval (CBIR) uses the visual contents of an image such as color, shape, texture. The Proposed algorithm which incorporates the advantages of various other algorithms to improve the accuracy and performance of retrieval. The accuracy of color histogram based matching can be increased by using Color Coherence for successive refinement. The speed of shape based retrieval can be enhanced by considering approximate shape rather than the exact shape given by canny algorithm. In addition to this a combination of color and shape based retrieval is also included to improve the accuracy of the result. Then the characteristics of the global color histogram, local color histogram and texture features are compared and analyzed for CBIR. It has mainly to reduce a semantic gap and time rate. These all methods are compressed by Error Diffusion Block Truncation Code (EDBTC). The combination of the color, texture and shape features provide a robust feature set for image retrieval.

**Keywords:** Content-Based Image Retrieval (CBIR) ,Error Diffusion Block Truncation Code (EDBTC),canny algorithm,color histograms

### I. Introduction

Content-based image retrieval (CBIR) system to improve the retrieval accuracy in the image. 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 constructed from the typical block truncation coding (BTC) or half toning-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 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 quantizes (i.e., high and low mean values) and a bitmap image. Two subimages constructed by the two quantizes 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 operation using the mean value of each image 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 achieve 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.

Even though the BTC scheme needs low computational complexity, it often suffers from blocking effect and false contour problems, making it less satisfactory for human perception. The halftoning-based BTC, namely, error diffusion BTC (EDBTC) is proposed to overcome the two above disadvantages of the BTC. Similar to the BTC scheme, EDBTC looks for a new representation (i.e., two quantizes and a bitmap image) for reducing the storage requirement. The EDBTC bitmap image is constructed by considering the quantized error which diffuses to the nearby pixels to compensate the overall brightness, and thus, this error diffusion strategy effectively removes the annoying blocking effect and false contour, while maintaining the low computational complexity. The low-pass nature of human visual system is employed in and to access the reconstructed image quality, in which the continuous image and its halftone version are perceived similarly by human vision when these two images are viewed from a distance.

### CONCEPT OF EDBTC

The EDBTC method divides a given image into multiple nonoverlapped image blocks and

each block is processed independently to obtain two extreme quantizes. This unique feature of independent processing enables the parallelism scenario. In bitmap image generation step, the pixel values in each block are threshold by a fixed average value in the block with employing error kernel to diffuse the quantization error to the neighboring pixels during the encoding stage. Some applications have been proposed in the literature triggered by the successfulness of EDBTC, such as image watermarking, inverse half toning, data hiding, image security, and halftone classification.

The EDBTC scheme performs well in those areas with promising results, as reported in, since it provides better reconstructed image quality than that of the BTC scheme. The concept of the EDBTC compression is catered to the CBIR domain, in which the image feature descriptor is constructed from the EDBTC compressed data stream. In this scheme, the compressed data stream that is already stored in database is not necessary decoded to obtain the image feature descriptor. The descriptor is directly derived from EDBTC color quantizes and bitmap image in compressed domain by involving the vector quantization (VQ) for the indexing. The similarity criterion between the query and target images is simply measured using the EDBTC feature descriptor. The EDBTC feature offers a competitive performance compared with that of the local binary pattern (LBP)-based feature and thus the EDBTC feature can substitute the LBP-based feature for image processing and computer vision application with even faster processing efficiency. A new image retrieval system has been proposed for the color image. Three

feature descriptors, namely, structure element correlation (SEC), gradient value correlation (GVC), and gradient direction correlation (GDC) are utilized to measure the similarity between the query and the target images in database. This indexing scheme provides a promising result in big database and outperforms the former existing approaches as reported. The method in compresses a grayscale image by combining the effectiveness of fractal encoding, discrete cosine transform (DCT), and standard deviation of an image block. An auxiliary encoding algorithm has also been proposed to improve the image quality and to reduce the blocking effect. As reported in this new encoding system achieves a good coding gain as well as the promising image quality with very efficient computation. In a new method for tamper detection and recovery is proposed utilizing the DCT coefficient, fractal coding scheme, and the matched-block technique. This new scheme yields a higher tampering detection rate and achieves good restored image quality, as demonstrated. The method in combines the fractal image compression and wavelet transform to reduce the time computation in image encoding stage. This method produces a good image quality with a fast encoding speed as reported.

## OBJECTIVE

The fast and efficient image coding with the no-search fractal coding strategies have been proposed. Both methods employ the modified gray-level transform to improve the successful matching probability between the range and domain block in the fractal coding. Two gray-level transforms on

quad tree partition are used into achieve a fast image coding and to improve the decoded image quality. The method exploits a fitting plan method and a modified gray-level transform to speedup the encoding process.

The fractal image coding presented accelerates the image encoding stage, reduces the compression ratio, and simultaneously improves the reconstructed image quality. A fast fractal coding is also proposed which utilizes the matching error threshold. This method first reduces the codebook capacity and takes advantage of matching error threshold to shorten the encoding runtime. The method can achieve a similar or better decoded image with the fast compression process compared with the conventional fractal encoding system with full search strategy.

## **II .Related Work**

### **An 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 centered 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.

### **Image Ranking and Retrieval Based on Multi-Attribute Queries**

A novel approach for ranking and retrieval of images based on multi-attribute queries. Existing image retrieval methods train separate classifiers for each word and heuristically combine their outputs for retrieving multiword queries. Moreover, these approaches also ignore the interdependencies among the query terms. In contrast, the propose a principled approach for multi-attribute retrieval which explicitly models the correlations that are present between the attributes. Given a multi-attribute query also utilize other attributes in the vocabulary which are not present in the query, for ranking/retrieval. Furthermore, integrate ranking and retrieval within the same formulation, by posing them as structured prediction problems. Extensive experimental evaluation on the Labeled Faces in the Wild (LFW), Face Tracer and PASCAL VOC datasets show that our approach significantly outperforms several state-of-the-art ranking and retrieval methods. These methods that exploit the semantic attributes of objects have attracted significant attention in the computer vision community.

### **Scalable Face Image Retrieval with Identity-Based Quantization and Multi-Reference Re-ranking**

State-of-the-art image retrieval systems achieve scalability by using bag-of-words representation and textual retrieval methods, but their performance degrades quickly in the face image domain, mainly because they 1) produce visual words with low discriminative power for face images, and

2) ignore the special properties of the faces. The leading features for face recognition can achieve good retrieval performance, but these features are not suitable for inverted indexing as they are high-dimensional and global, thus not scalable in either computational or storage cost. A new scalable face representation using both local and global features. In the indexing stage, exploit special properties of faces to design new component-based local features, which are subsequently quantized into visual words using a novel identity-based quantization scheme. It is also use a very small hamming signature (40 bytes) to encode the discriminative global feature for each face. In the retrieval stage, candidate images are firstly retrieved from the inverted index of visual words.

#### **Content Based Video Retrieval using Entropy, Edge detection, and Black and White Color Features**

In this paper proposed integration of entropy and black and white points on edge, features of video key frames for developing proposed video retrieval systems. First, video feature database is created using entropy feature extracted from key video frames of video database. Same feature is extracted from video frame query.

Then extract the edge and black and white points on edge from database frames and query frame. Finally similarity measure is applied to retrieve the best matching frames and corresponding videos are presented as output. The experimental results show that feature integration is effective. In this paper using **Content Based Video Retrieval (CBVR)**, system works more effectively as these

deals with content of video rather than video metadata. Proposed Content Based Video Retrieval Systems works on two modules i.e. Creation of feature database and retrieval using query feature extraction with similarity measures.

### **III. Retrieval Process**

#### **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.

#### **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 similar color (such as sky and sea, or leaves and grass). A variety of techniques with 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.

### Shape based image search

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.

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.

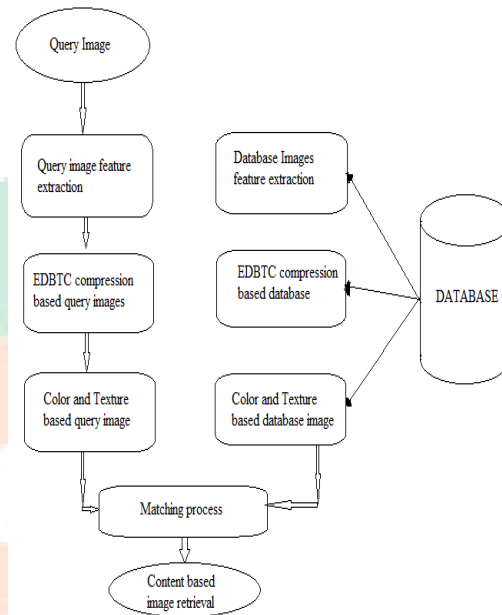


Figure 1: Architecture Diagram of the content based image retrieval

### EDBTC Compression Based Search

This section presents a review of the EDBTC with its extension to color image compression. The EDBTC compresses an image in an effective way by incorporating the error diffusion kernel to generate a bitmap image. Simultaneously, it produces two extreme quantizes, namely, minimum and maximum quantizes. The EDBTC scheme offers a great advantage in its low computational complexity in the bitmap image and two extreme quantizes generation. In addition, EDBTC scheme produces better image quality compared with the classical BTC approaches. The detail explanation and comparison 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 quantizes and its image bitmap are produced by computing the first moment, second moment, and variance value causing a high computational burden.

### Image Retrieval

The proposed work is image retrieval model for problem of similar images searching and retrieval in the search space of the images by integrating content-based image retrieval (CBIR) techniques, with the semantic description of the image set. The aim is to reduce the semantic gap between high level query requirement and low level features of the content based image such that the system can be ready to meet human nature way and needs in description and retrieval image. It will use lab feature extraction for to detect the color, and to identify the texture using multi-dimensional texture analysis another one then the edge orientation histogram is used for shape detection.

### IV. Conclusion

A Content Based Image Retrieval method has been proposed which uses the combination of dominant color, edge oriented texture and canny edge detection for shape. A features covering color, texture and shape proved that the proposed method yielded higher average precision and average recall. Content-based image retrieval (CBIR) system to improve the retrieval accuracy in the image. In addition the proposed method always showed performance gain of average retrieval time over the other methods. The proposed retrieval

method is to be evaluated for more various database images.

Propose and combine two orthogonal methods to utilize automatically detected images to significantly improve content-based image retrieval. This is the first proposal of combining low-level features and automatically detected images for content-based face image retrieval. The proposed work is image retrieval model for problem of similar images searching and retrieval in the search space of the images by integrating content-based image retrieval techniques with the semantic description of the image set.

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