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Survey on CBIR using Halftoning BTC

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Abstract: ***As the tremendous growth in the volume of images as well as the widespread application in multiple fields, the requirements for development of image retrieval techniques are enhanced. The image retrieval is an interesting and rapidly growing methodology in all fields. It is an effective and well organized approach for retrieving the image. In the other end, image mining is the arising concept which can be used to extract potential information from the collection of images. Image mining is the process of searching and discovering valuable information and knowledge from large volumes of data. It is an extension of data mining techniques for images. This paper presents a technique for content-based image retrieval (CBIR) by exploiting the advantage of low complexity ordered-dither block truncation coding (ODBTC) for the generation of image content descriptor.***

Key words: ***Bit pattern feature, Color co-occurrence feature, Content-based image retrieval, Ordered dither block truncation coding, Block truncation coding.***

I. INTRODUCTION

An image revival system returns a set of images from a collection of images in the database to fulfil the user's requirements which evaluates the features such as image content, edge pattern correspondence, colour similarity, etc. An image retrieval system gives an efficient way to access, browse, and recovers a set of similar images in the real-time applications. Several approaches have been developed to capture the information of image contents by directly computing the image characteristics from an image as reported in database. In this survey, the proposed system is compared with previous existing system in which contains numerous existing techniques.

In Content-Based Image Retrieval (CBIR), visual characteristics such as shape, color and texture are the descriptors to characterize images. During the retrieval, 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.

Proposed novel approach for generalized image retrieval based on semantic concepts like color, texture and edge histogram descriptor and Block Truncation Coding (BTC) are used to extract features from image dataset

In this study, a new approach is proposed to index images in database using features generated from the ODBTC compressed data stream. This indexing technique can be extended for CBIR. ODBTC compresses an image into a set of color quantizers and a bitmap image. The proposed image retrieval system generates two image features, namely Color Co-occurrence Feature (CCF) and Bit Pattern Feature (BPF), from the above color quantizers and bitmap image, respectively.

II. LITERATURE SURVEY

S. Silakari, M. Motwani, and M. Maheshwari [1] present 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. 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.

Y. Wu and D. C. Coll [2] presents 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.

Chih-Chin Lai, Member, IEEE, and Ying-Chuan Chen [3] presents digital image libraries and other multimedia databases have been dramatically expanded in recent years. In order to effectively and precisely retrieve the desired images from a large image database, the development of a content-based image retrieval system has become an important research issue. In this paper, a user oriented mechanism for CBIR method based on an interactive genetic algorithm is proposed. Color attributes like the mean value, the standard deviation, and the image bitmap of a color image are used as the features for retrieval. In addition, the entropy based on the gray level co-occurrence matrix and the edge histogram of an image are also considered as the texture features.

N. E. Lasmar and Y. Berthoumieu [4] presents framework of texture image retrieval, a new family of stochastic multivariate modeling is proposed based on Gaussian Copula and wavelet decompositions.We take advantage of the copula paradigm, which makes it possible to separate dependence structure from marginal behavior. We introduce two new multivariate models using, respectively,generalized Gaussian and Weibull densities. These models capture both the subband marginal distributions and the correlation between wavelet coefficients. We derive, as a similarity measure, a closed form expression of the Jeffrey divergence between Gaussian copula-based multivariate models.

J. J. de Mesquita Sa Junior, P. C. Cortex, and A. R. Backes [5] presents 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, the original image is divided into fixed-size non overlapping blocks of size MN. 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.

III. System Architecture

The ODBTC employed in the proposed method decomposes an image into a bitmap image and two color quantizers which are subsequently exploited for deriving the image feature descriptor. Two image features are introduced in the proposed method to characterize the image contents, i.e., Color Co-occurrence Feature (CCF) and Bit Pattern Feature (BPF). The CCF is derived from the two color quantizers, and the BPF is from the bitmap image.

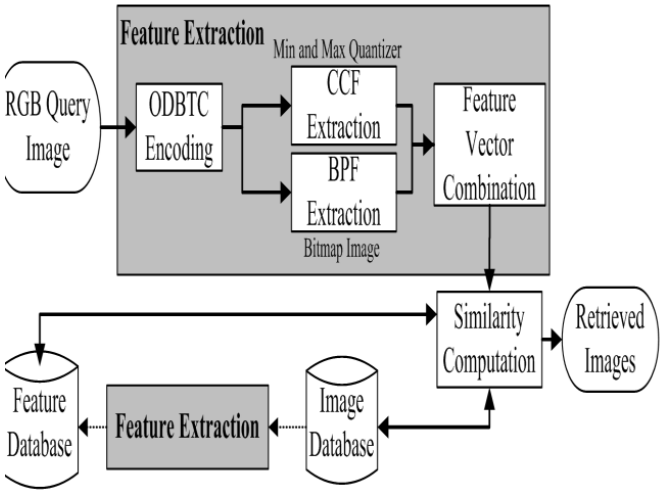

Fig1: Block diagram of the proposed image retrieval method

A. Color Co-Occurrence Feature (CCF):

The color distribution of the pixels in an image contains huge amount of information about the image contents. The attribute of an image can be acquired from the image color distribution by means of color co-occurrence matrix. This matrix calculates the occurrence probability of a pixel along with its adjacent neighbors to construct the specific color information. This matrix also represents the spatial information of an image. Color Co-occurrence Feature (CCF) can be derived from the color co-occurrence matrix.

B. Bit Pattern Feature (BPF):

Bit Pattern Feature (BPF), characterizes the edges, shape, and image contents. The BPF is simply derived as the occurrence probability of the bitmap image mapped into the a specific bit pattern codeword.

C. The Similarity Measure of the Features:

The similarity between two images can be measured using the relative distance measure. The similarity distance plays an important role for retrieving a set of similar images. The query image is firstly encoded with the ODBTC, yielding the corresponding CCF and BPF. The two feature are later compared with the features of target images in the database. A set of similar images to the query image is returned and ordered based on their similarity distance score, i.e,. the lowest score indicates the most similar image to the query image.

IV. Conclusion

In this study, 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.

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