

An Efficient Content based Image Retrieval System

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ABSTRACT

The basic objective of content based image retrieval is to extract visual content of an image automatically, similar to color, shape or texture. The CBIR technology can be used in several applications such as forensic laboratories, crime detection, and image searching sites. One most probable application is matching a forensic sketch to a set of previously available set of images. In this paper, we have proposed an efficient methodology for the content based image retrieval. The related work done by other authors is also discussed in brief. The experimental results have shown that the recall rate of the proposed methodology is better in comparison to the existing one.

Keywords

Image Retrieval, Clustering, k Means, wavelet transform, feature extraction.

1. INTRODUCTION

"Content-based" means that the search will analyze the actual contents of the image rather than the metadata like keywords, descriptions or tags, linked with the image. Here the 'content' refers to colors and textures information that can be derived from the image itself. CBIR is attractive because most web based image search engines rely purely on metadata and this produces a lot of false detection in the results [2], [3]. Day by day processors becoming powerful, as well the cost of memories becoming cheaper, so the deployment of large image databases for a variety of applications have now become achievable. Even the records of satellite and medical imagery have been attracting more and more users in various professional fields [1,8]. Effectively accessing desired images from large and varied image databases is now a requisite. The CBIR extracts the visual content of the images in the database and described by multidimensional feature factors.

2. RELATED WORK

The Color Selection exploited CBIR system [6,9,11] facilitates query-by-color. The scheme is stand on 11 color categories used through all people. Later that the low frequency DCT coefficients that are transformed from YUV color space as feature vectors are used for retrieval of images [7,12]. This newly proposed model allows users to select its dominant feature of query images so as to improve the retrieval performance. This technique is sufficient for performing effective retrieval by introducing users' opinions on the query images. Region of Interest Image Indexing System [4,13] allows the user to select the region of interest and the system will search all the images in the database to find the all related regions among the database. Universal Model for Content-Based Image Retrieval combine three feature extraction methods namely color, the feature and the edge histogram descriptor [5,16]. All the image properties analyzed in this work are by using computer vision and image processing algorithms. The color the histograms of images are

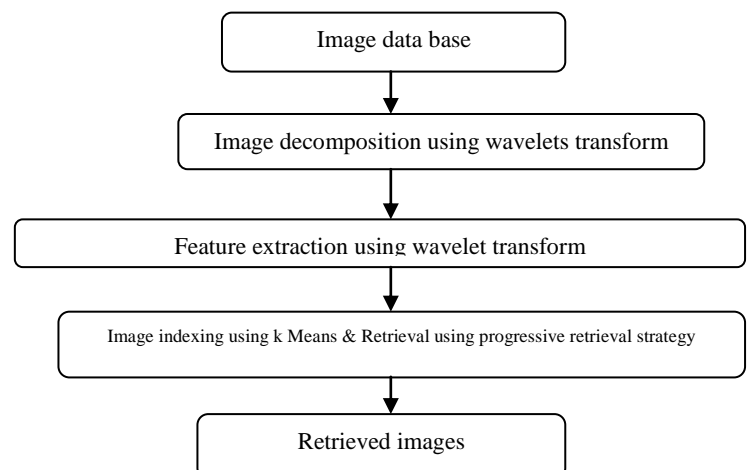
computed for texture co-occurrence matrix based entropy, energy is calculated and for edge density it is Edge Histogram Descriptor (EHD) that is found. A novel idea is developed based on greedy strategy to reduce the computational complexity for the image retrieval. All these existing approaches required large storage space and lot of computation time to calculate the matrix of features. So authors proposed the efficient content based image retrieval using advanced color and texture feature extraction is deployed. In such scheme the color features are extracted using three color moments and texture features are extracted directly from block based DCT coefficients which are in transform domain. Consequently it does not necessitate any complex computation for texture feature extraction. This newly proposed method can be directly applied to image in the compressed domain, this answer the storage space problem.

CBIR is the retrieval of images based on visual features same as shape, color and text. There are numerous CBIR systems at this time exist, also are being constantly expanded. Color Selection utilized CBIR system [6,14,15] facilitates query-by-color. Such system is standing on 11 color categories. The low frequency DCT coefficients that are transformed from YUV color space as feature vectors are used for retrieval of images [7]. It allows users to select its dominant feature of query images. But the technique is sufficient for performing effective retrieval by introducing users' opinions on the query images.

3. PROPOSED SYSTEM

We will propose a novel and efficient method for the content based image retrieval. The efficiency/ recall rate of the proposed system will be higher in comparison to that of the existing method. It will use a combination of wavelet transform and the K means clustering algorithm. The outline of the proposed technique is shown below:

3.1 Flowchart



3.2 Algorithm used

The modified k-means algorithm with improved initial centre is as follows:

Steps:

1. If in the data set D the data points contain both positive attributes and the negative attributes as well then switch to step 2 otherwise switches to step 4.
2. In this step, the algorithm finds the minimum value of the attribute in the input data set D.
3. In this step, the minimum value found in step 2 is subtracted from each data point attribute.
4. Calculate the distance from origin for each of the data point.
5. Sort all the data points according to the distances found in step 4.
6. Partition the sorted data points of step 5 into k equal sets.
7. In this step centroid is chosen. The middle point of each set is selected as centroid.

3.3 Advantages

The efficiency/ recall rate will be better in comparison to the existing recall rate:

Recall Rate = (No of relevant images retrieved) / (Total no of relevant images in the data base)

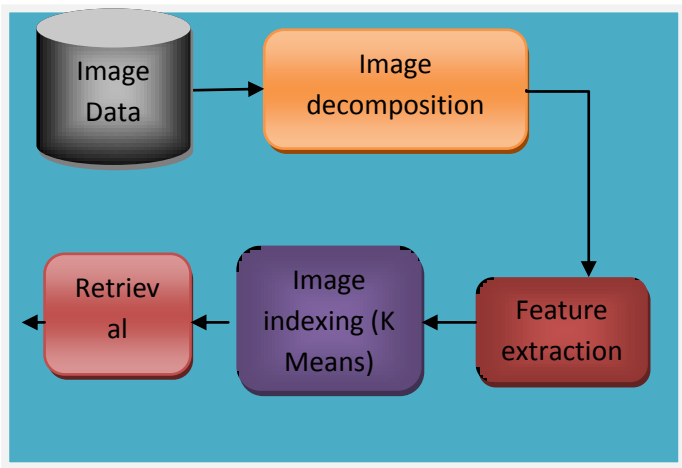


Fig.1. Block Diagram

4. DATA SET USED

4.1 WANG Database

The WANG database is a subset of 1,000 images of the Corel stock photo database which have been manually selected and which form 10 classes of 100 images each. The WANG database can be considered similar to common stock photo retrieval tasks with several images from each category and a potential user having an image from a particular category and looking for similar images which have e.g. cheaper royalties or which have not been used by other media. The 10 classes are used for relevance estimation: given a query image, it is assumed that the user is searching for images from the same class, and therefore the remaining 99 images from the same class are considered relevant and the images from all other classes are considered irrelevant



5. CONCLUSION

In this paper, we have proposed an efficient CBIR, the recall rate is better. The CBIR technology can be used in several applications such as image search, social networking sites, and forensic labs. CBIR system is a computationally expensive task. Also it requires a lot of accuracy in the output. This paper proposed a critical review of modern CBIR methods. The merits and demerits of each CBIR methods are discussed.

In the future, a more fast method can be proposed. An updated indexing and extraction method can be proposed. It will help in achieving better recall rate at a brisk pace.

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