Abstract
The explosive growth of image database has made the database management extremely tedious. Thus our approach focus on an efficient content based image retrieval (CBIR) technique that automatically search a particular image from a huge database with less iterations even in average and worst case. We propose a method with new index structure and query processing technique to improve the retrieval effectiveness and efficiency. This approach uses a combination of multi-resolution color, texture, and shape features to index the images. We have also considered strategies to minimize the effects of user’s inaccurate relevance feedback. Extensive experiments were simulated in realistic environments and the approach significantly reduced the number of required iterations and improved overall retrieval performance. The proposed system has used Corel database of 1000 images and the feature vectors of the query image were compared with feature vectors of the database and similar images were obtained.

Keywords: Fast Query Point, Movement Techniques, Efficient Feature, CBIR Systems

Introduction
This paper “Fast Query Point Movement Techniques with efficient Feature Extraction for CBIR Systems” is that which extracts images from a database of images by constructing a query set of features and displays images that have a minimum dissimilarity metric from images in the database. The features under considered are color, texture and shape. Thus, using matching and comparison algorithms, the color, texture and shape features of one image are compared and matched to the corresponding features of another image. In the end, these metrics are performed one after another, so as to retrieve database images that are similar to the query.
Content Based Image Retrieval
"Content-based" means that the search will analyze the actual contents of the image rather than the metadata such as keywords, tags, and/or descriptions associated with the image. The term 'content' refers to Colors, Shapes, Textures or any other information that can be derived from the image itself. CBIR is desirable because most web based image search engines rely purely on metadata and this produces a lot of garbage in the results. Also having human’s manually entered keywords for images in a large database can be inefficient, expensive and may not capture every keyword that describes the image. Thus a system that can filter images based on their content would provide better indexing and return more accurate results. IMAGE RETRIEVAL has recently drawn the attention of many researchers in the computer science community. Image processing usually refers to digital image processing, but optical and analog image processing also are possible.

Problem Definition
The retrieval system has many disadvantages such as text based image search, distributing similar files over various folders which make the viewing of these files difficult. Another prime disadvantage is that categorization of files can be done based on a single parameter with respect to the content of the folders. Annotation and retrieval will not give target search and all process is time consuming and may not be accurate.

Existing System
In the existing system, image databases and collections can be enormous in size, containing hundreds, thousands or even millions of images. The conventional method of image retrieval is searching for a keyword that would match the descriptive keyword assigned to the image by a human categorizer. Relevance feedback technique is used to retrieve the images through query. The query will match similarity in database images to the query images. The query retrieves most relevant images. Annotation query refinement based relevance feedback method, suffer from slow convergence and do not guarantee to find intended targets.

Disadvantages of Existing System
Certain disadvantages of existing system include the following: Iterations are increased, Time consuming process, we cannot assure the exact images, and Image Search is based on text which does not retrieve more accurate results.

Objective
The objective of this paper is to reduce the number of required iterations and to improve the overall retrieval performance and to reduce the time that is consumed. We can guarantee to get intended target. Target search in content-based image retrieval (CBIR) systems refers to finding a specific (target) image such as a particular registered logo or a specific historical photograph. The problem involves entering an image as a query into a software application that is designed to employ CBIR techniques in extracting visual properties, and matching them. The input could be parameters, sketches or example images. This is done to retrieve images in the database that are visually similar to the query image.

Methodology Adopted
To overcome the difficulties in existing system we are implementing the following modules to extract images from a database of images by constructing a query set of features and displaying images that have a minimum dissimilarity metric from images in the database. The various modules in this project are Local tetra patterns, Edge Histogram, Color Layout, Auto color correlogram and Similarity fusion.

**Proposed System**

The local binary pattern (LBP), the local derivative patterns (LDP), and the local tetra patterns LTP extract the information based on the distribution of edges, which are coded using only two directions (positive direction or negative direction). Thus, it is evident that the performance of these methods can be improved by differentiating the edges in more than two directions. This observation has motivated us to propose the four direction code, referred to as local tetra patterns (LTrPs) for CBIR. We propose a second-order LTrP that is calculated based on the direction of pixels using horizontal and vertical derivatives. Our method is different from the existing LDP in a manner that it makes use of $0^\circ$ and $90^\circ$ derivatives of LDPs for further calculating the directionality of each pixel. The performance resulting from the combination of the GT and the LTrP has also been analyzed. Finally, the generalized (n-1)th-order LTrP operator has been presented by using nth-order derivatives. The performance of our method is compared with the LBP, LDP, and LTP by conducting three experiments on different image database. Similar to LDP, in order to compare our method with the LBP, we consider the LBP as a non-directional first-order local pattern called the *first-order* LTrP.

**Advantages of the Proposed System**

The method which have been adopted have the following advantages: Iterations are less, can assure the exact images, Automatic Indexing process, Target based image retrieval, Increases retrieval speed. The tradeoff decreases as more efficient algorithms are utilized and increased computational power becomes inexpensive.

**Salient Features of the System**

CBIR is an automatic process to search relevant images based on user input. Then it compares with images from the database and returns the results. Concurrent file system (CFS) acts as a database which is used for fast matching with minimum iteration. Discrete cosine transformation, efficient algorithm, zigzag algorithm are used to adjust the query.

**Literature Survey**

Works related to feature extraction and image retrieval literature are surveyed as follows,

The local binary pattern (LBP) feature has emerged as a silver lining in the field of texture classification and retrieval. Ojala et al.[4] proposed LBPs, which are converted to a rotational invariant version for texture classification. Various extensions of the LBP, such as LBP variance with global matching, dominant LBPs, completed LBPs, joint distribution of local patterns with Gaussian mixtures, etc., are proposed for rotational invariant texture classification. The LBP operator on facial expression analysis and recognition were successful.

Xi Li et al. [6] proposed a multiscale heat-kernel-based face representation as heat kernels are known to perform well in characterizing the topological structural information of face
appearance. Furthermore, the LBP descriptor is incorporated into multiscale heat-kernel face representation for the purpose of capturing texture information of the face appearance.

Zhang et al. [1] proposed local derivative patterns (LDPs) for face recognition, where they considered the LBP as non-directional first-order local patterns collected from the first-order derivatives and extended the same approach for i-th order LDPs. Lei et al. proved that exploiting the image information jointly in image space, scale, and orientation domains can provide richer clues, which are not evident in any one individual domain. This process involves two phases. In the first phase, the face image is decomposed into different scale and orientation responses by convolving with multiscale and multiorientation Gabor filters. In the second phase, LBP analysis is used to describe the neighboring relationship not only in image space but also in different scale and orientation responses.

Zhao et al. [2] proposed a local spatiotemporal descriptor using the LBP to represent and recognize spoken isolated phrases solely based on visual input. Spatiotemporal LBP s extracted from mouth regions are used for describing isolated phrase sequences. Su et al. proposed the hybrid technique for graphic retrieval with the LBP and the Haar wavelet referred as structured local binary Haar pattern that encodes the polarity rather than the magnitude of the difference between accumulated gray values of adjacent rectangles. The LBP has been also used for texture segmentation, background modeling and detection, shape localization, interest region description, and biomedical image retrieval. The versions of the LBP and the LDP in the open literature cannot adequately deal with the range of appearance variations that commonly occur in unconstrained natural images due to illumination, pose, facial expression, aging, partial occlusions, etc. In order to address this problem, the local ternary pattern (LTP) has been introduced for face recognition under different lighting conditions.

Liu Yang et al., [3] have proposed research on content based image retrieval in medical images like X-ray images collected from plain radiography. In CBIR systems, similarity measurement is a difficult component, similarity means resemblance in visual appearance, that is the two images are look like one another or similarity in semantic annotation. In medical image retrieval, two images of tumors that look quite different yet are both malignant. This is problematic for medical image retrieval. The author developed the Distance metric learning algorithm that preserves both visual resemblance and semantic similarity in medical image retrieval. The boosting framework first learns the binary representation using side information and computes the distance as a weighted hamming distance using the learned binary representation. The advantage of the algorithm is to improve the retrieval performance and preserves both the semantic relevance and the visual similarity. The disadvantage of the algorithm is the dimension of metric will not give the exact distance, if metric size is increased and its accuracy is decreased. In conclusion the proposed algorithm is to preserve both the semantic relevance and the visual similarity of the medical images. It gives the good retrieval accuracy compared to other algorithms.

Xiaoyan Li et al., [5] have designed and implemented the research on content based image retrieval in gallery image of the flowers and textual descriptors using Punning algorithm. Image retrieval, aims to provide effective and efficient tools for querying the large image data bases. Pure text based retrieval techniques ignore the useful image features. This technique extracts the image via multimedia analysis, as a result some relevant images might be missing in the query
output. The proposed algorithm measures the image semantic similarity, this improves the query accuracy. When it traversal in the image semantic hierarchy, irrelevant branches are pruned; so that the search space is further reduced. The proposed algorithm has the advantage that reduces the search cost in semantic space. It has the disadvantage that hierarchy search takes more time to retrieve the image and lexical hierarchy will not give the exact result. In conclusion the proposed algorithm gives the good accuracy for search image.

System Design

Functional Architecture

Functional architecture is an architectural model that identifies the functions and their interactions for the corresponding system needs. The Functional Architecture for the proposed system is given in Fig 1

Local Tetra Patterns

The idea of local patterns (the LBP, the LDP, and the LTP) proposed has been adopted to define LTrPs. The LTrP describes the spatial structure of the local texture using the direction of the center gray pixel.

Given image , the first-order derivatives along $0^\circ$ and $90^\circ$ directions are denoted as $I^l_{\theta}(g_p)\mid \theta = 0^\circ, 90^\circ$. Let $g_c$ denote the center pixel in I, and let $g_h$ and $g_v$ denote the horizontal and vertical neighborhoods of $g_c$, respectively. Then, the first-order derivatives at the center pixel $g_c$ can be written as $I^l_{\theta}(g_c) = I(g_h) - I(g_v)$.
$I_{90}^1 (g_c) = I(g_c) - I(g_e)$

And the direction of the center pixel can be calculated as

$$I_{Dir}^1 (g_c) = \begin{cases} 1, & I_{0s}^1 (g_c) \geq 0 \text{ and } I_{90s}^1 (g_c) \geq 0 \\ 2, & I_{0s}^1 (g_c) \geq 0 \text{ and } I_{90s}^1 (g_c) \geq 0 \\ 3, & I_{0s}^1 (g_c) \geq 0 \text{ and } I_{90s}^1 (g_c) \geq 0 \\ 4, & I_{0s}^1 (g_c) \geq 0 \text{ and } I_{90s}^1 (g_c) \geq 0 \end{cases}$$

It is evident that the possible direction for each center pixel can be either 1, 2, 3, or 4, and eventually, the image is converted into four values, i.e., directions.

The second-order $LTrP^2 (g_c)$ is defined as

$$f_3 (I_{Dir}^1 (g_c), I_{Dir}^1 (g_p)) = \begin{cases} 0, & I_{Dir}^1 (g_c) = I_{Dir}^1 (g_p) \\ I_{Dir}^1 (g_p) \text{ else} \end{cases}$$

From the above we get 8-bit tetra pattern for each center pixel. Then, we separate all patterns into four parts based on the direction of center pixel. Finally, the tetra patterns for each part (direction) are converted to three binary patterns. The magnitude component of the local difference operator to propose the magnitude LBP, along with the sign LBP for texture classification. They proved that, although the sign component extracts more useful information as compared with the magnitude component, exploiting the combination of sign and magnitude components can provide better clues, which are not evident in any one individual component. For the local pattern with neighborhoods, combinations of LBPs are possible, resulting in the feature vector. The computational cost of this feature vector is very high. In order to reduce the computational cost, we consider the uniform patterns. The uniform pattern refers to the uniform appearance pattern that has limited discontinuities in the circular binary representation. In this paper, those patterns that have less than or equal to two discontinuities in the circular binary representation are referred to as the uniform patterns, and the remaining patterns are referred to as non-uniform.

**Color Layout**

The image array is partitioned into 8x8 blocks. Representative colors are selected and expressed in YCbCr color space. Each of the three components (Y, Cb and Cr) is transformed by 8x8 DCT (Discrete Cosine Transform) as shown in fig 5.1. The resulting sets of DCT coefficients are zigzag-scanned and the first few coefficients are nonlinearly quantized to form the descriptor. YCbCr and Y'CbCr are a practical approximation to color processing and perceptual uniformity,
where the primary colors corresponding roughly to Red, Green and Blue are processed into perceptually meaningful information.

Conclusion
The process is about image search engine, not only by text annotated to the image by an end user, but also by the visual contents available into the image itself. The process reduces the number of required iterations and improves overall retrieval performance and time consumed will be very less. Thus, we can guarantee that intended target related images can be retrieved. The data stored and retrieved is accurate and gives enough information whenever the data is required in required format. All modules consist of necessary reports to help the users of the project to work easily and user-friendly.

Future Enhancement
In Retrieval performance is promising and clearly shows the advantage of searching images based on similarity fusion in terms of effectiveness and efficiency that reduces the search space of database images. Overall, this retrieval framework is useful as a front end for large databases where a search can be performed in diverse images for teaching, training and research purposes. This is done using more number of feature extraction Techniques like FCTH, CEDD, Tamura, Gabor, Jpeg Coefficient Histogram, JCD, HSV Color Histogram, sift, bovw features and Re-ranking method for filtering the images.

References

