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CONTENT BASED IMAGE RETRIEVAL USING IMAGE FEATURE

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ABSTRACT

Humans' using the images for their communication is the novel process. Images involve in many fields like medicine, journalism, education and in other areas. The relevance feedback approach to image retrieval is a powerful technique and has been an active research direction for the past few years. Various ad hoc parameter estimation techniques have been proposed for relevance feedback. In addition, methods that perform optimization on multi-level image content model have been formulated. However, these methods only perform relevance feedback on the low-level image features and fail to address the images' semantic content. In this proposed mechanism, we are using the CBIR algorithm for retrieving the images which are related to the input image. Here we are taking the texture, color and shape of the image and stored in the database. When the user asks query, then it will be matched with the database and retrieve the image. It will retrieve the exact image by comparing the texture, color and shape.

Key words: Image Retrieval, Data Mining, Relevance Feedback, Content Model, Multilevel Image.

1. INTRODUCTION

With the increasing availability of digital images, automatic image retrieval tools provide an efficient means for users to navigate through them. Even though traditional methods allow the user to post queries and obtain results, the retrieval accuracy is severely limited because of the inherent complexity of the images for users' to describe exactly [1]. The more recent relevance feedback approach, on the other hand, reduces the needs for a user to provide accurate

Initial queries by estimating the user's ideal query using the positive and negative examples given by the user. The current relevance feedback based systems estimate the ideal query parameters on only the low-level image features such as colour, texture, and shape. These systems work well if the feature vectors can capture the essence of the query. For example, if the user is searching for an image with complex textures having a particular combination of colours, this query would be extremely difficult to describe but can be reasonably represented by a combination of colour and texture features[2][14]. Therefore, with a few positive and negative examples, the relevance feedback system will be able to return reasonably accurate results.

To address the limitations of the current relevance feedback systems, we propose a framework that performs relevance feedback on both the images' semantic contents represented by keywords and the low-level feature vectors such as colour, texture, and shape. The contribution of our work is twofold [3] [4]. First, it introduces a method to construct a semantic network on top of an image database and uses a simple machine learning technique to learn from user queries and feedbacks to further improve this semantic network. In addition, we propose a framework in which semantic and low-level feature based relevance feedback can be seamlessly integrated.

2. EXISTING TECHNIQUES

A symbolic image is an array representing a set of objects and a set of spatial relations among them. Symbolic images and related structures have been used in a number of applications including Image Databases, Spatial Reasoning, Path Planning and Spatial Pattern Matching. In this paper we describe a *Pictorial Query-By-Example* (PQBE) language aimed at the retrieval of *direction relations* from symbolic images. As in the case of verbal Query-By-Example, PQBE generalises from the example given by the user, but instead of having queries in the form of skeleton tables showing the relation scheme, we have skeleton images which are they symbolic images [5].

In this article, we give an overview of the main tasks involved in designing a platform for the evaluation of content-based image retrieval systems. A number of issues should be addressed from the construction of an image collection to the definition of standard performance measures.

The relevance feedback approach to image retrieval is a powerful technique and has been an active research direction for the past few years [15] however, these methods only perform relevance feedback on the low-level image features and fail to address the images' semantic content. In this paper, we propose a relevance feedback technique, ***iFind***, to take advantage of the semantic contents of the images in addition to the low-level features. By forming a semantic network on top of the keyword association on the images, we are able to accurately deduce and utilize the images' semantic contents for retrieval purposes [6]. The accuracy and effectiveness of our method is demonstrated with experimental results on real-world image collections.

3. CONTENT BASED IMAGE RETRIEVAL SYSTEMS

Content-based image retrieval (CBIR), also known as query by image content (QBIC) and content-based visual information retrieval (CBVIR) is the application of computer vision to the image retrieval problem. This system is based upon a combination of higher-level and lower-level vision principles [16]. Higher-level analysis uses perceptual organization, inference and grouping principles to extract semantic information describing the structural content of an image. Lower-level analysis uses image texture, shape and color histogram techniques. The image search is of two types such as target search and category search. The goal of target search is to retrieve known and specific image, such as registered logo, a historical photograph, or a particular painting [7]. The goal of category search is to retrieve a given semantic class or genre of images or used to find relevant images that the user might not be aware ahead of time, such as scenery images or skyscrapers.

4 IMAGE PROCESSING FUNCTIONS

4.1. Image pre-processing
4.2. Feature extraction
4.3. Training of images
4.4. Retrieval of Image

4.1 Image Pre-Processing

The content retrieval is based on the Image Pre-processing module [8] [9]. Here, an image will be stored in the database using the three level processes. They are:
1. Low level process: It is done for reducing the noise in the image.
2. Mid level process: It is done for segmenting and describing the image.

3. High Level process: It is done for making sense to human vision.

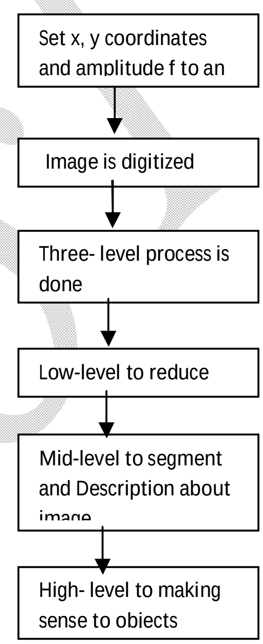

Fig.1 Image pre-processing

4.2 **Feature Extraction**

Here, the features of an image are analyzed and stored in the database. The features are Texture, Shape and Colour.

1. In Texture analysis the texture features are extracted

2. In Shape analysis the shape will be determined by considering the Edge. Here, the edges of the image are taken. Thus, the shape is considered

3. The last is Colour analysis. The RGB values are considered here. Thus, the colour features are extracted.

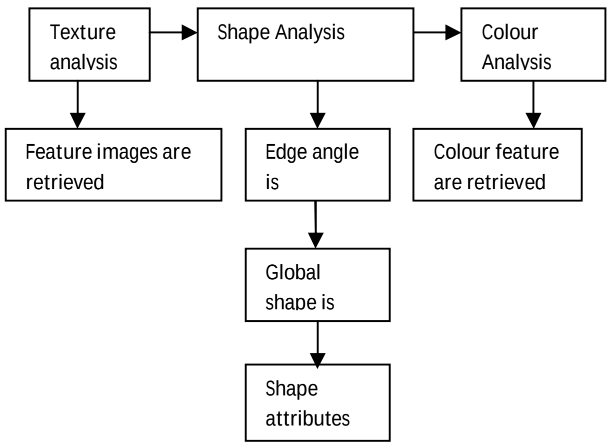

Fig.2 Feature extraction

4.3 Training of Images

After extracting the image features like texture and matrix conversion the pixel values are trained in the database by labelling the features of the images. The matrix conversion is done by giving intensity at each point x, y and RGB values are found [12] [13]. A matrix will be formed having M rows and N columns. Then the images are labelled in the database. So, it can be retrieved from the database easily. These labelling is done by the features of the image. Now, the image is stored in the database.

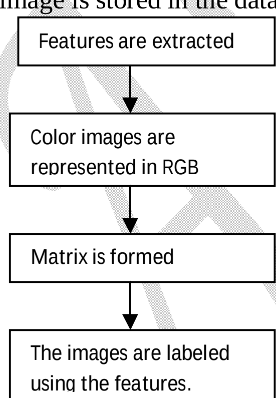

Fig.3 Training of image

4.4 Image Retrieval

Now, the image is given as the input image for extracting the results. These results are extracted by the following process:

1. First, the image is given as the input to the from the camera.
2. Initially, this image is a raw image where it contains noise.
3. Then, the Features like Texture, Color and Shape are extracted by the RGB values
4. These features values and database values are matched. If it matched there will be fast retrieval of the image is done. The content of the image is also retrieved.

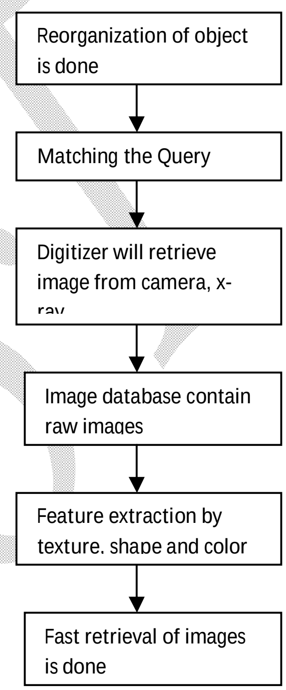

Fig.4 Image retrieval

5. CONCLUSION

In this paper, a new framework is presented in which semantics and low-level feature based relevance feedbacks are combined to help each other in achieving higher retrieval accuracy with lesser number of feedback iterations required from the user. The novel feature that distinguished the proposed framework from the existing feedback approaches in image database is twofold. First, it introduces a method to construct a semantic network on top of an image database and uses a simple machine learning technique to learn from user queries and feedbacks to further improve this semantic network. In addition, a scheme is introduced in which semantic and low-level feature based relevance feedback is seamlessly Experimental evaluations of the proposed framework have shown that it is effective and robust and improves the retrieval performance of CBIR systems significantly

6. FUTURE ENHANCEMENT

- Histogram of 25 colors and 25 textures for each image is computed from a vector quantization.
- It is based on precision and recall. The precision and recall are considered for one category and have as many values as image in the database.
- Mainly used for medical purposes.

7. EXPERIMENTAL RESULTS

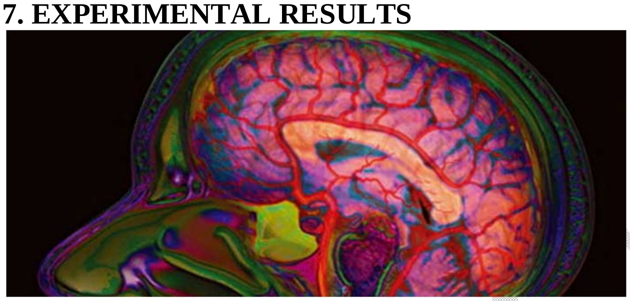

Fig 1.Give the Disease Name and Browse the Image of the Disease

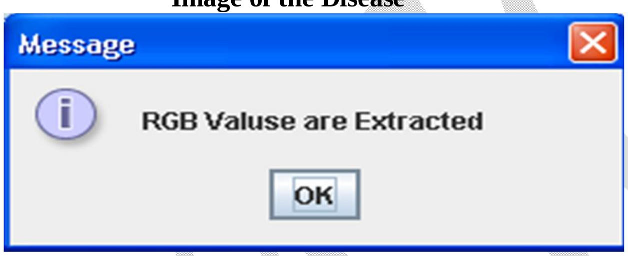

Fig 2. RGB Extration

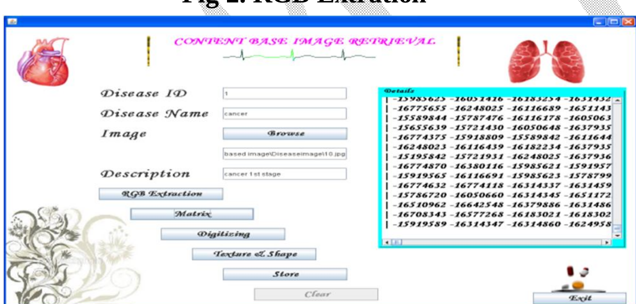

Fig 3. Relevant image based on query

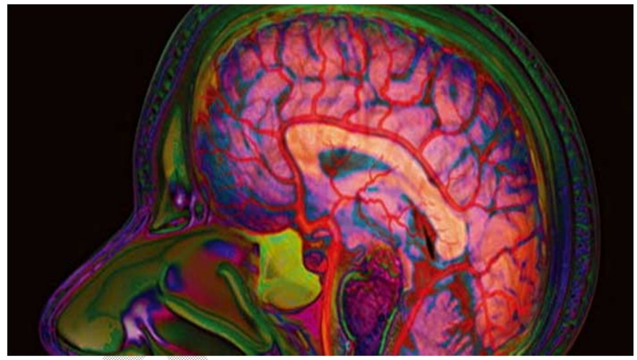

Fig 4. Extracted image

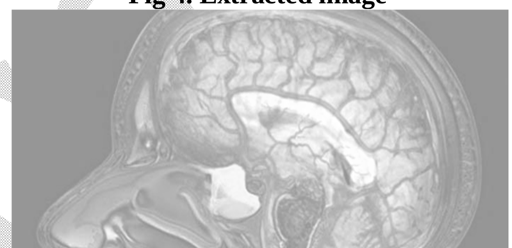

Fig 5. Texture and Shape. Image Is Shown

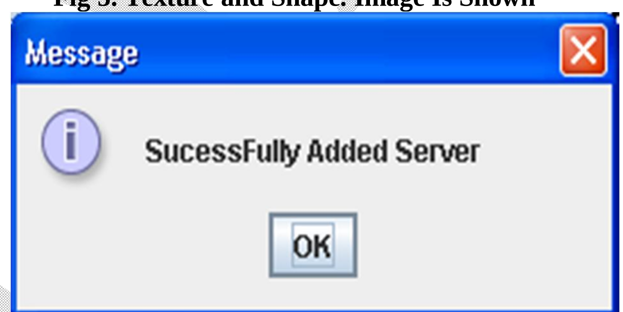

Fig 6. Image Is Stored

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