

# A Survey on: Hybrid semantic model for content based image retrieval

Asst Professor Lalit Gehlod, Aman Chouhan, Mr. Jitendra Soni

Dept. Of Computer Engineering Institute Of Engineering & Technology,  
Devi Ahilya University, Indore, India.

*Abstract- The challenging topic in image processing is extracting accurate images from the data base according to the user defined query and objects available in database image. Therefore in this paper we described different technique for content based image retrieval and their functioning advantages. In addition of that it includes the investigation about the different recent approaches that are developed recently. We go through many technologies and made some comparisons between them. Finally we proposed a methodology that is accurate for image retrieval as well as efficient as possible.*

## 1. INTRODUCTION

Web is concentration of information and different data, which allow user to access the data as per their use. It has so many applications one of which is search engine. Search engines are playing important role to search and consume data. The data can be found in different formats and types. But now in these days' multimedia data based search engines are frequently accessed. As of rapid increase in demand of multimedia data on internet more accurately an improved technique is required.

Therefore studies on different techniques have been conducted on multimedia data search systems and a new model for image search is proposed. The proposed work presents a way to find the most relevant image as per the content in image using content based image search. Traditionally content based image search works with relevance feedback and re-ranking but these techniques produces additional delay to process results. Thus in order to reduce delay, image annotation technique is included to detect user search interest. The annotation based techniques includes text or object Tags with image to recognize the actual queried image by user. This will enable the user to search the image on the basis of image content and text too.

This paper contributes on the survey the different approaches and techniques developed in recent years. In addition of that that provides an overview of the proposed model for efficient and accurate image identification.

## 2. IMAGE RETRIEVAL

Image Retrieval system is computer system for searching, retrieving the image from a large database of digital images. Normal way of image retrieval is text based. This technique is popular but needs very specific sedcription of the query which is tedious and not always possible. Most traditional and common methods of image retrieval utilize some method of adding metadata such as captioning, keywords, or descriptions to the images so that retrieval can be performed over the annotation words. Manual image annotation is time consuming, laborious and expensive; to address this, there has been a large amount of research done on automatic image annotation. Additionally, the increase in social web applications and the semantic web have inspired the development of several web-based image annotation tools.

**A. Image retrieval based on re-ranking technique[1]** Image retrieval is a key issue of user concern. Normal way of image retrieval is the text based image retrieval technique (TBIR). TBIR needs rich semantic textual description of web images. This technique is popular but needs very specific description of the query which is tedious and not always possible. Therefore generally the process of image search includes searching of image based on keyword typed. The process that occurs in the background is not so simple though when query is entered in the search box for searching the image, it is forwarded to the internet. The server gets the URL's of the images based on the tagging of the textual word from the internet and sends them back to the client.

[2] Techniques based on CBIR are found to be more vibrant and are likely to be adopted for such applications. Most of the earlier technique used only visual features and didn't capture user's intentions. To bridge this semantic gap, method like active re-ranking has been proposed. Multi-model graph based and circular re-ranking techniques proposed in recent years capture more than one feature of image for more accurate re-ranking results. These methods do not always compete but can complement each other. The domain of image harvesting, retrieval and re-ranking offers a vast scope for exploration as well as innovation. This survey will prove to be beneficial to gain overview of the work done in this field. This scheme also has drawback as result of image is not accurate.

### ***B. Relevance feedback for CBIR on multi-text-on & microstructure descriptor***

[1] Usually, the only way of searching these collections was by keyword indexing, or simply by browsing. Digital image databases however, open the way to content based searching. CBIR system is required such as shape of an object. The primary goal of the CBIR system is to construct meaningful descriptions of physical attributes from image to facilitate efficient and effective retrieval. While there is much research effort addressing content-based image retrieval issues. The performances of content-based image retrieval methods are still limited, especially in two aspects of retrieval accuracy and response.

[2] To be more profitable relevance feedback techniques are incorporated into CBIR such that more precise results can be obtained by taking user's feedbacks into account. The semantic gap between low-level features and high-level concept handled by the user is one of the main problems in image retrieval. On the other hand, the relevance feedback has been used on many CBIR systems such as an effective solution to reduce the semantic gap. The gap is reduce by using the Multitexton Histogram descriptor. In this paper, a novel framewoek method called Relevance feedback is used to achieve high efficient and effectiveness of relevance of CBIR in coping with the large-scale image data. For that reason this paper proposes a method of relevance feedback based on Multitexton Histogram descriptor (MSD) for efficient feature extraction of an image. By using this method, high quality of image retrieval on Relevance Feedback is reduced substantially by using the navigation patterns discovered from the user query log, which reduce the computational processing time.

[3] In this paper they proposed a new method to reduce the semantic gap by the relevance feedback image retrieval based on Multitexton Histogram descriptor. To deal with the long iteration problem

of CBIR, can be reduced using Micro Structure Descriptor. In summary, the main feature of Relevance Feedback is to efficiently optimize the retrieval quality of interactive CBIR. Intially, the feature represntation done with Multitexton Histogram, then generated micro structured image is used in retrieving images from the databased. Later, from the retrieved image set user feedback is given for a pattern-based search to match the user's intention. Finally the most relevant set of images are retrieved from the database. As a result, traditional problems such as visual diversity and exploration convergence are solved.

### ***C. Optimization of Feature-Extraction Technique for CBIR***

[1] In CBIR, reteieval of image is based on similarities in their content, i.e., textures, colors, shapes etc. Which are considered the lower level features of an image. These conventional approaches for image retrieval are based on the computation of the similarity between the users query and image. In CBIR each image stored in the database has its features extracted and compared to the features of the query image. Thus broadly, it involves two processes viz features extraction and feature matching. Features extraction involves the image features to a distinguishable extent. Average RGB, Color Moments, Co-occurrence, Local Color Histogram, Global Color Histogram and Geometric Momentsare used to extract features from the test image. Feature matching, on the other hand, involves matching the extracted features to yield results that exhibitvisual similarities.Feature vectors are calculated for the given image. The Euclidean distance is used as default implementation for comparing two feature vectors. If the distance between feature vectors of the query image and images in the database is small enough, the corresponding image in the database is to be considered as a match to the query. The search is usually based on similarity rather than on exact match and the retrieval results are then ranked accordingly to a similarity index.

[2] We will analyze six technique one using a query image from each class of the WANG database. The six techniques are Average RGB, Color Moment, Co-occurrence, Local Color Histogram, Global Color Histogram and Geometric Moment. These six techniques will be evaluated using the parameters, Time ,Accuracy and Redundancy factor, we will be plained in the next section.

[3] The goal is to find the optimum combination of techniques to be used for each class of query which result is the best possible Time, Accuracy and Redundancy Factor, as compared to using any single technique at one point of time. This will result in an 'adaptive' CBIR system, which can

adapt itself according to query image given by the user and use the relevant techniques for the image retrieval process to produce the accurate result.

[4] This scheme has also problem that is how to create a scalable and effective algorithm. There are a huge amount of image on the Web, and more and more new photo are uploaded to photo sharing. Hence, a scalable and effective algorithm is necessary to analyze both visual information and the tags of image.

#### D. Content Based Image Retrieval Systems[]

[1] As the network and development of multimedia technologies are becoming more popular, users are not satisfied with the traditional information retrieval techniques. So nowadays the the content based image retrieval are becoming a source of exact and fast retrieval. In this paper the techniques of content based image retrieval are discussed, analysed and compared. It also introduced the feature like neuro fuzzy technique, color histogram, texture and edge density for accurate and effective Content Based Image Retrieval System.

[2] The purpose of this survey is to provide an overview of the functionality of content based image retrieval systems. Most systems use color and textures few systems use shape feature, and still less use layout features. Fuzzy logic has been used extensively in various areas to improve the performance of the system and to achieve better results in different applications. The fuzzy inference integrates various features perfectly in content based image retrieval system and reflect the user's subjective requirements the experiments achieve good performance and demonstrate the efficiency and robustness of system.

#### 4. PROPOSED METHODOLOGY

The overview of the proposed systems components and discussed in this section of document.

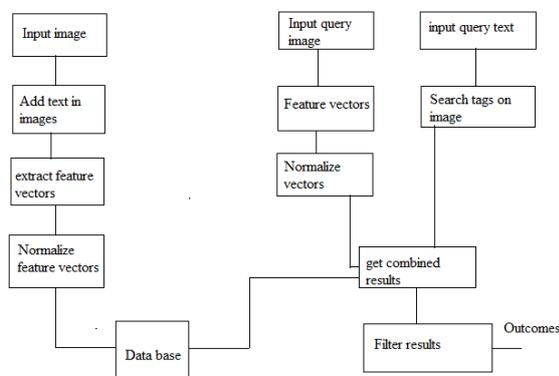


Figure 1 proposed technique

**Input image:** That is training phase of the system where system accepts user image as input to learn from example.

**Add text in images:** A small note on image also stored in the data base as annotation of text.

**Normalize feature vectors:** In this phase from multiple values a common value is prepared and stored in data base in place of complete image. In testing session we use these stored values from the database and consumes to extract the optimum results from the database.

**Input query image:** User can make query for search results as image from the query image feature vectors are estimated as in training phase.

**Feature vectors:** Here grid color movement, Canny edge detection, local binary patterns are estimated as feature set.

**Normalized feature vector:** Individual features are contains their own definition and storage of each features can take more space and time for comparison thus a common value is calculated to store them.

**Text input:** User can also place text for search image contains.

**Search similar tag:** The text in image is searched on local database to get image from database.

**Combine results:** Here the result obtained from text query and image query is listed in same place.

**Filter results:** To obtain the optimum results from the data omitted as result.

#### 5. CONCLUSION

We have studied all the above aspects of image retrieval and proposed our technique of image retrieval which is supposed to enhance the performance as well as accuracy. Basic thing reviewed from this survey of available image retrieval and re-ranking techniques is that the text-based image retrieval is not sufficient for obtaining precise images for a given query. Thus techniques based on CBIR are found to be more vibrant and are likely to be adopted for such applications. Most of the earlier techniques used only visual features and didn't capture user's intentions. To bridge this semantic gap, method like image annotation based technique has been proposed. To reduce the delay, an image annotation based technique is proposed without including re-ranking or relevance feedback to detect user search interest. The annotation based techniques includes text with image object. This will help the user to search the image on the basis of image content and text too. In this survey paper we have proposed a method, later we will implement it to analyze its performance.

## **REFERENCES**

- [1] Mayuri D. joshirevati M. Deshmukh, kalashreeN.Hemke, AshwiniBhake and RakhiWajgi: Image retrieval and re-ranking technique, vol.5, No.2, April 2014
- [2] KranthiKumar.K, T.VenuGopal, M. Rama Krishna: Relevance feedback for Content based image retrieval based on Multitexton Histogram And Microstructure Descriptor,vol 04, Special Issue 01;2013
- [3] AmanChadha, Sushmit Malik, Ravdeepjohar:Comparative Study and Optimization of Feature-Extraction Techniques for Content based Image Retrieval,vol.52-No.20, August 2012
- [4] NidhiSinghai: Content Based Image Retrieval Systems, Vol 4-No.2, July 2010