Various Feature Extraction Techniques in CBIRS: Survey

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ABSTRACT: Content based image retrieval is also called as query by image content (QBIC) and content based visual information (CBVIR), which is the application of computer system techniques to the image retrieval problem that means the process of searching digital images in huge databases. Content-based image retrieval (CBIR) is better than that of traditional approaches. Content-based means that the search will analyzes the contents of the image not keywords, tags, or descriptions, which is to be associated with image. Content basically deals with colors, textures and shapes. CBIR is necessary as searches rely on metadata are dependent on annotation quality .The evaluation of the effectiveness of keyword image search is subjective and is very time -consuming.

KEYWORDS: CBIR, Content Based Image Retrieval, Image Retrieval, Feature Extraction, Texture based.

I. INTRODUCTION

 Basically CBIR system is capable of providing images information on the basis of their content. A single visual feature can considered only as a single perception while multiple visual can perceive an image through different perceptions [1]. Early time CBIR systems were developed to search databases for relevant images on basis of color, texture and some other information. When these CBIR systems were developed, the user-friendly interfaces need arise. So progress in the CBIR field was started to includehuman-centred design which tries to fulfil the needs of user. It basically means inclusion of query methods which allow descriptive semantics, queries in which user feedback is involved and the systems which include machine learning [2]. In 1992 these systems were developed when system was used to describe experiments for images retrieval from a database based on the colors and shapes [3]. After that process has been started to retrieve relevant images from the large databases. Techniques, algorithms and tools are used to arise from the field. [2]. The primary goal is to develop machine that is capable in the management of images. Human community are taking necessary steps to make it a best real worldtechnology.It can be thought of as a paradigm shift for the further generation in the field of image retrieval.Now the main motive is how this technology can progress so that the common person can use it in the same sense that of text based images. We can take example of Google, Gmail and Yahoo. We can see that such of these sites are being used aggressively because of their limitless benefits. Now we can think of similar success for the image retrieval if both researchers and the human being both will take necessary steps toward it.However there is a subtle difference between the progress level of the text based and the content based image retrieval. For the text-based images search-engine like Google successfullyretrievesdocuments without content understanding, which is not an easy way for the user. Most algorithms have failed to accurately find its higher level concept. Problemassociated with algorithms isdependency on visual similarity in judging semantic similarity. However, semantic similarity can be thought of as a higher subjective measure [4].Now many of the combining CBIR techniques have become available.
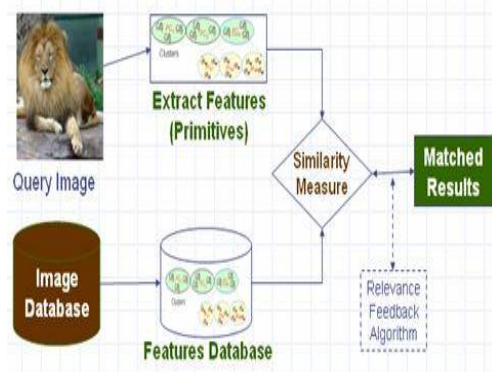
Fig: 1 Diagram for image retrieval

Thus overall we can conclude that the content based image retrieval proved to be very helpful for us. Because it saves our both time and cost.

II. IMAGE RETRIEVAL METHODS

Two types of the image retrieval methods are used basically:
---Image Meta Search (Text Based)
---Content Based Image Retrieval

A. Image Meta Search
Many types of the image databases are available on the web like Alta Vista Photo Founder and yahoo image. Large Web search engines allows image searching using keywords. These databases are capable to index many different images and to excel them at different queries. Concepts of text Meta search can also be applied to images [5].

B. Content Based Image Retrieval
It is basically the process of retrieving the image from the database or from the Meta data. It is usually performed on the basis of color, textures and shapes [6].

III. SEARCH TYPES

Major obstacle in the content based image retrieval (CBIR) research is because of the lack of quantitative criteria for the comparison of algorithms. Over the search length, the statistics are presented [7]. We can take example of the number of images that were observed before an image found, and that was accurately "similar" to a required image. We can categorize image searches into the following categories [8].

A. Target Specific Research
It basically involves the process of retrieving exact target image from the image databases. Searching process continues till the target image is not found in the image database. This type of category in very helpful for the testing purpose [8].

B. Category Search
A category image set up by the user such as cats, dogs. However the same finding criteria will be used that of the target specific research.

IV. FEATURES EXTRACTION TECHNIQUES

A. Low Level Based Feature:
The low level based feature is basically the most important feature of the CBIR system [21]. We cando image extraction from the entire area or from the region. Basically the CBIRS system is based upon the regions. So the most of the people deals with the regions basically. Global level retrieval is basically a very simple task over the process of the image retrieval

B. **Color Based Features:**

Color level feature is the most commonly used feature in the field of the image retrieval. There is a large availability of the color spaces and the varieties of color are available on different sectors. Through the image feature, image can be easily detected by the human being. It relies on the property of the light reflection and the brain processing. There has been the development of the system based on the textures and the color feature [22].To determines the texture feature statistical texture methods are used. For the color feature RGB color histogram is used basically [23].

C. **Textures Based Features:**

This is one of the hidden attribute. Texture based basically provides many types of the real world images. For the texture based feature Gabor filtering, waveletstransforms are used basically for extracting the image feature[24]. Gabor filter and the wavelet transforms are basically designed for the rectangular images.

D. **Miscellaneous:**

In the late 1990's Content Based Image Retrieval (CBIR) [12], [13] which were developed so that the overcome the limitations of text-based image retrieval can be solved. There aremany early CBIR systems whichperformretrieval andare based upon the global features of the image [14, 15, 16,]. In the present scenario,region-based techniques have been focused. Output of methods that are based on the segmentation depends on the segmentation quality in 1996. Greg Pass Ramin Zabih [17] described refinement of the histogram for images comparison. Histogram refinement basically disperses the pixels in a given bucket of several classes, which is on the basis of some local property. In a given bucket, only pixels having the same class are compared. A split histogram is basically called a color coherence vector (CCV). Over the year 1997, Chad Carson, Serge Belongie, Hay it Greenspan, and Jitendra Malik [18], representan image representation which basically provides a transformation.Mullar revels in 2004 that, in the DICOMheaders there is a higher error rates and the format images can be of the JPEG, TIFF etc. A large number of research basically focuses on the content based medical image retrieval [19].The analyses of the CBIR systems is basically represented over different network topologies. Ryszard S.Chora´s (2007*)* also contributes its work in the identification of the existing CBIR problems [20].Over the last decades, little efforts is done basically.A medical Image Retrieval Framework by Pattanaik, Bhalke (2012) tried their best to overcome the limitation of Text based image retrieval using the consideration of contents and feature of image [21]. The system that was represented by Rahman .et al (2013) has shown their results significantly [11]. In the latest article, the framework that is based on the FRAR model with the Bayesian approaches is for the heterogeneous image retrieval.

V. CONCLUSION

This paper defines the combination of all the feature extraction like low level features, texture based features and texture based features. With the development of technology, more images come into view and have become a part of our daily existence. There is a wide range of applications which require image processing tools.
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