

Image Retrieval Using Its Visual Properties

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Abstract: The visual properties of images are color, shape and texture etc. By using these properties it is possible to interactively find any kind of image from the huge database of images. Color and texture are two important visual features in order to find an image. And the technique used for this is Content Based Image Retrieval (CBIR). Searching of images from a huge database is becoming a serious problem in data management field. The Traditional method i.e. text based method of searching does not meet the requirements of user. The system content Based Image Retrieval involves relevant searching of images from the query image based on extracted features.

Keywords: CBIR; Feature Extraction; Color; Texture; Shape; RGB

I. INTRODUCTION

Image document have become an important information source, due to the rapid development of internet technology. To retrieve certain image from all available images is difficult so, to solve this problem image retrieval system have been developed. To overcome the disadvantage of text based retrieval system content based image retrieval was introduced. CBIR is automatic system which searches for query image in database and retrieves relevant images. Image retrieval which is based on content is very useful in following applications, such as historical research, fashion and graphic design, architectural and engineering design, crime prevention, medical diagnosis. Extraction of best features presented in query image is the main task of CBIR. Color is one of the frequently used feature which is invariant to image size and orientation, the reason for this is we can extract color information simply from images and extracting information about shape and texture is more complex compare to color. Different image retrieval system has been built, based on specific image retrieval task. Query by image content, WebSEEK and VisualSEEK are some existing CBIR systems. The main aim of CBIR is to develop efficient visual-content-based technique for search and retrieve relevant images from collection of large scale digital images.

II. LITERATURE SURVEY

The need of improvement in traditional method of image retrieval is that, traditional method of image indexing have proven to be inefficient and very time consuming. CBIR is collaborative filtering technique predicting the preference of unknown user by using known attitude of other users. To basic consideration of link structure analysis are pages which are co-cited by certain page are likely to tolerate on same topic and second one is pages which are often visited by certain user are possibly similar.

III. PROPOSED SYSTEM

A. Problem Statement

The problem involves entering an image as a query into a software application that is designed to employ CBIR techniques in extracting visual properties, matching them. This is done to retrieve images in the database that are visually similar to the query image.

B. Proposed Method

The proposed method is dependent upon color and texture feature of image sub-blocks with one to one matching. Algorithm as follows,

Step-1: Divide each image in the database also the query image into six equal size blocks.

Step-2: For each sub-block construct cumulative HSV color histogram.

Step-3: All sub-block obtain features such as energy Contrast, Entropy and Inverse difference from GLCM.

Step-4: Built combined feature vector of color and texture.

Step-5: Calculate the distance between feature vector of query.

IV. FEATURE EXTRACTION

CBIR is two steps process first one is feature extraction and second one is feature matching. In feature extraction we extract we extract image features to different extent. The information extracted from image like color, texture and shape are known as feature vector. Process of extraction is perform on both query image and image in database. Matching of image involves use of features of both images and comparing them to search for similar features of imaging database.

C. Color

The most widely used visual property of the image is color in image retrieval. Color is the easiest feature of image to describe. It provides the sensitive information about color. Human eyes are very sensible to identify colors and can easily differentiate the objects using color feature. Color is the property that which is dependent on light reflection and processes that information to the brain. We use color in everyday life to describe the objects, things, places. Mostly colors are defined in three dimensional color spaces like one is Red, Green, Blue (RGB), second one is Hue, Saturation, Value (HSV) or Hue, Saturation and Brightness (HSB). Most of the images are in the form of JPEG, GIF, BMP which uses the RGB color space to describe the image. The main method to represent the information of color of an image is known as the color Histogram.

Histogram is the type of graph or type of bar graph. The color histogram represents the pixels proportion for each color in the image then, this proportion is compared with the query image. From that query image the color histogram is calculated. Using the process of matching the images are retrieved whose histogram is matched with the query image.

D. Texture

Image retrieval using texture feature is the most important method. Structural information of the surface is described by the texture feature of the image like clouds, leaves, bricks, fabric, etc. Texture has some different qualities like periodicity and scale which can be describe in terms of contrast, coarseness, direction etc. Texture measures have larger variety than the color measure. Wavelets and Gabor filters are the measures for capturing the texture of the image. With respect to the scale of the image and changes in directions texture measures capture the different characteristics of the images. Texture feature extraction of image requires lots of storage space and lots of time for the computation of matrix of features. Most common existing approach for feature extraction uses the Statistical method. There are different types of methods for texture feature extraction such as Gray level co-occurrence matrix, Tamura features and Gabor transform.

E. Shape

Shape does not mean the shape of the image but to the shape of the particular region that is being sought out. Shape will often be determined first applying segmentation or edge detection to an image. Another methods like use shape filters to identify given shape of an image. Shape is one of the most primitive features of the Content Based Image Retrieval. There are number of techniques for shape description. These techniques divided into two types first one is boundary based and second one is region based. Boundary based technique uses only the border of the shape and contour of the shape. These methods are also known as the external methods of shape extraction. It describes this method by considering the region using external characteristics i.e. pixels along the boundary, region based shape representation uses entire shape region by describing the internal characteristics i.e. pixels contained in the region.

V. WORK FLOW

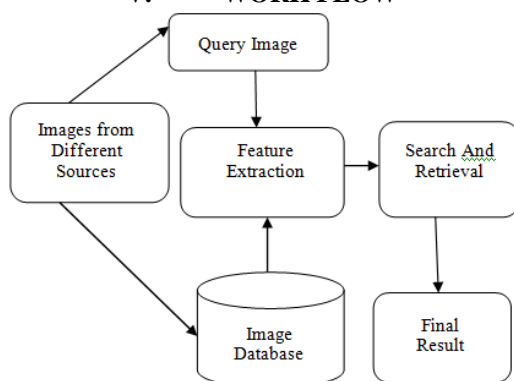


Fig.1

VI. APPLICATIONS

Applications of CBIR are as follows:

1. Intellectual Property
New trademark image is compared with existing trademark, while Trademark image registration to avoid conflict.
2. Crime Prevention
Police department use for Face recognition system.
3. Medical Diagnosis
For diagnosis and monitoring purpose medical professionals use images in the form of X-rays, Ultrasound etc.
4. Remote Sensing
Geographical information system, whether forecast, monitoring of satellite image.

VII. CONCLUSION

The rise in the size of database of images causes the development of effective and efficient retrieval systems. In this paper retrieval of images based on color, texture and shape feature extraction is present. The CBIR system retrieves the images based on visual properties of image such as color, texture and shape which is, opposed to retrieving image based on textual indexing.

REFERENCES

- [1]. http://en.wikipedia.org/wiki/content-based_image_retrieval
- [2]. <http://www.engineersgarage.com/contribution/content-based-image-retrieval-matlab-project>
- [3]. <http://www.cs.washington.edu/homes/shapiro/cbir.html>
- [4]. Pranjul Mishra,"Content Based Image Retrieval: Survey on the Combination of Color and Texture Features".
- [5]. Mitali Ghorpade,"Content Based Image Retrieval Using Advanced Color and Texture Features".