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A PATH FOR HORIZING YOUR INNOVATIVE WORK

CONTENT BASED IMAGE RETRIEVAL SYSTEM

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Abstract: Content-based image retrieval 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.

Keywords: Content, Indexing, Content-Based Visual Information Retrieval, Context, Segmentation, Query by Image Content, Query and Annotation

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INTRODUCTION

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 techniques to the image retrieval issues that is image mining from large digital image databases. Concept based approaches and Content based image retrieval are very much distinct with each other.

CBIR is desirable because most web based image search engines rely purely on metadata and this produces a lot of garbage in a result. Also manually enter keywords for images in a large database can be expensive, inefficient and may not capture every keyword that depicts the image. Thus a system that can sort out images based on their content would provide better indexing and return more accurate results. In other words, images were first annotated with text and then searched using a text-based approach from traditional database management systems. Comprehensive surveys of early text-based image retrieval methods can be found in Text-based image retrieval uses traditional database techniques to deal with images. Through text metaphors, images can be organized by semantic hierarchies or topical to facilitate easy navigation and browsing based on standard Boolean queries.

"Content-based" means that the search will analyze the actual contents of the image rather than the metadata such as tags, descriptions, and/or keywords associated with the image. Content-based image retrieval, a methodology which uses visual contents to search images from large scale image databases according to users' interests, has been a vigorous and fast advancing research area since the 1990s. The term 'content' in this context might refer to colors, shapes, textures, or any additional information that can be derived from the image itself.

Feature of image content:

1) **Color:**

Computing distance measures based on color similarity is achieved by computing a color histogram for each image that identifies the proportion of pixels within an image holding specific values. Current investigation is attempting to segment color proportion by region and by spatial relationship among several color regions. Investigating images based on the colors they contain is one of the most widely used techniques because it does not depend on image size or direction. Color searches will usually engage comparing color histograms.

2) **Shape:**

Simple shapes can be described by basic geometry objects such as a set of two or more points, a curve, a plane or a solid figure (e.g. cube or sphere). Shape does not refer to the shape of an image but to the shape of a particular region that is being sought out. Shapes will often be recognized first applying segmentation or edge detection to an image.

3) **Texture:**

The distinctive physical masterpiece or structure of images is changes with respect to the shape, size and arrangement of its parts. Texture is a difficult concept to symbolize. The recognition of specific textures in an image is achieved primarily by modeling texture as a two-dimensional gray level variation. The corresponding brightness of pairs of pixels is computed such that degree of contrast, directionality and coarseness may be projected, regularity, classes of textures like silky or rough.

Limitations of text-based approach:

- Problem of image annotation for large volumes of database
- This is valid only for one language with image retrieval this limitation should not exist.
- Problem of human perception user have to be specific for better result.
- Too much responsibility on the end-user for give proper query. Conflict may occur while giving query for search engine.

Working of CBIR:

Content based image retrieval system is work of the following principles.

1) Submits an existing picture as a query if it doesn't exist then submits his sketch of image as query.

2) The query is galvanized by system for searching best match with query image.

3) It will compare these features with that of other images in a database.

4) Relevant results will be displayed to the user.

Methods of content based search:

1) Histogram:

A histogram is a graphical representation of the distribution of data in the digital image. Histogram of an image is a graphical representation of the lightness and color distribution in a digital image. It plots the number of pixels for lightness and color value. Histogram is a measure used to illustrate the image. In simple words it means the distribution of color brightness across the image. The brightness values range in [0 to 255} by looking at the histogram for a specific image a viewer will be able to judge the entire tonal distribution at a glance.

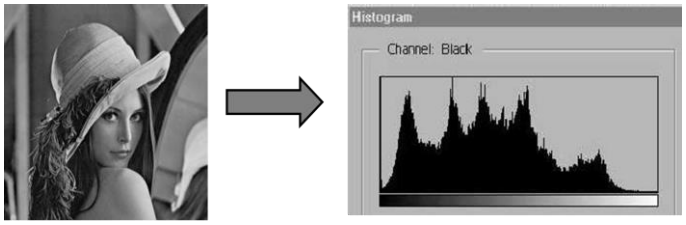

Fig 1 Image histogram

Here Figure 1 illustrates the histogram of the image according to the calibration of the data in that image. According to the tone of colors histogram graph is plotted.

2) Regions and Relationships:

Region and Relationships means that the histogram measure is not taken globally for the whole image, but locally for different image regions. These region-histogram features were used as index of the image database

- Segment the image into regions.
- Find their properties and interrelationships.
- Construct a graph representation with nodes for regions and edges for spatial relationships.
- Use graph matching to compare images. Image segmentation is the process of partitioning a digital image into multiple segments. The goal of segmentation is to simplify and/or change the representation of an image into something that is more meaningful and easier to

analyze. Image segmentation is typically used to locate objects and boundaries (lines, curves, etc.) in images.

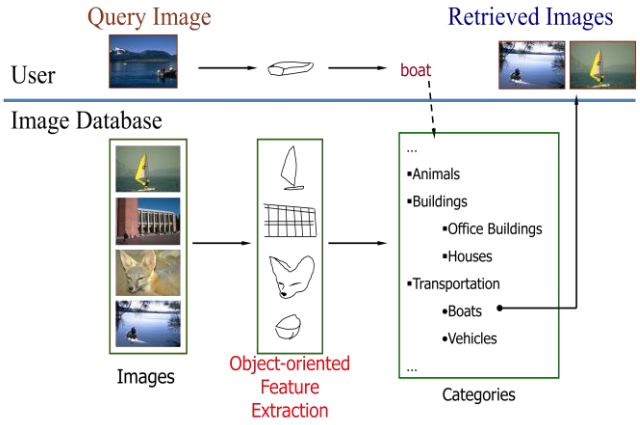

Fig. 2 Region based comparison

3) Rough sketch:

It allows queries in the form of rough line-sketches that outline the basic structure or form that is composition of an image. This permits the user to quickly and easily transform a mental picture of an image into a query. In an image retrieval system it can be reasonable to give a fast reply with a rough retrieval method and give the user the ability to interact easily with the system by browsing the retrieved images.

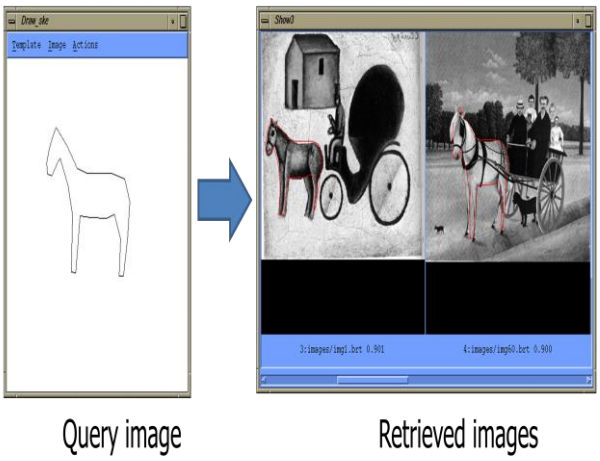

Fig. 3 Rough sketch as query

In Figure3 which is example of rough sketch as query in which we are going to input the query image which is drawn as rough input. A line-sketch is a line drawing created with a few strokes of the mouse and a color- composition is a rough composition in color. We distinguish between similarity-search where a natural image is used as the query and sketch-based search where a synthetic image is used.

Methods of content based search:

There is a broad class of methods and systems aimed at browsing through a large set of images from unspecified sources. Users of search by association at the start have no specific aim other than find interesting things.

- Art Collections Fine, Arts Museum of San Francisco etc.
- Medical Image Databases MRI, Ultrasound, X-Ray etc.
- Scientific Databases Earth Sciences.
- The World Wide Web

CONCLUSIONS:

Content based image retrieval appears to increase the efficiency and accuracy of unstructured data retrieval. It's easy to retrieve proper result using content based image retrieval system. It may be sufficient that a retrieval system present similar images in some user-defined sense.

Content based image retrieval system will produce best outcome based on the input content which will be accurate as per the input content and gives best matching with the given input.

Content based image retrieval system will become the main stream in the years to come. Adaptive and machine learning approaches offer one way forward with much promise. Using content based image retrieval system problem of image annotation for large databases is overcome.

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