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Intent Search: Using Content-Based Image Retrieval

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Abstract: *Web-scale image search engines (e.g. Google Image Search, Bing Image Search) mostly rely on surrounding text features which leads to ambiguous and noisy search results which are far from satisfactory. It is important to use visual information in order to solve the ambiguity in text-based image retrieval. In this paper, we propose a novel Internet image search approach. It only requires the user to click on one query image with the minimum effort and images from a pool retrieved by text-based search are re-ranked based on both visual and textual content. Content image search engines is a product design to capture user intention for locating specific images stored in image database on the basis of tags & image attributes.*

Keywords: *Image search, Intention, Image re-ranking, Adaptive similarity, Keyword expansion, visual query expansion, Image retrievals.*

1. INTRODUCTION

Everyday large amount of flow of multimedia information contributes to the Internet. This will increase the need of ability to manipulate, classify, archive and access them quickly and selectively. While text indexing is ubiquitous, it is often limited, tedious and subjective for describing image content. One of the main problems was the difficulty of locating the desired image in a large and varied collection. More effective techniques are needed with collections containing thousands of items. The problems with text-based access to images have prompted increasing interest in the development of image based solutions. This is more often referred to as Content Based Image Retrieval (CBIR). Content Based Image Retrieval relies on the characterization of primitive features such as colour, shape and texture that can be automatically extracted from the images themselves.

The paper will be describing the basic idea of the project Intent search: using content based image retrieval system and its advantages, disadvantages and applications. The paper is divided in five parts. The first part describes the literature survey i.e. the previous work done on the Image searching process. Then the further parts will describe about the CBIR methodology, architecture, advantages, disadvantages and its applications.

2. LITERATURE SURVEY

Image searching is wildly used for searching an images needed for different purposes such as projects, Surveys, E-commerce & other information. So it is becoming very important to make the searching process more easy and efficient. Now days the system used for images searching such as Google, bing & Yahoo. These systems basically works on string based searching. So the result set generated from these systems can contains some noisy results. Here feedback mechanism is in the sense that related images, but this will fire another query & gives new result set, so it is not going to modify current result set. So it may again generate the noisy result set.

	String Based Search	Image Based Search	Feedback Mechanism
Google	Yes	Partially	No
Bing	Yes	No	No
Yahoo	Yes	No	No
Proposed System	Yes	Yes	Yes

CBIR technique promises the possibility of convenient, easy & efficient searching of images using both string based image searching & content based image searching along with feedback mechanism.

3. SYSTEM SPECIFICATIONS

Intent search: content based image retrieval System gives user result of both string based & content based image searching. System provides field for user to enter textual query. Then from resultant set user can select query image by one click on that image. System provides mechanism for inserting and deleting the images from database. Updating & deleting the images also modifies the tag file. One click image act as feedback from user to the system. System maintains the database & tag files for images. System maintains another file which stores all the tags which are present in the images from database. For changing the query, user just need to select similar image as query image by one click.

4. SYSTEM ARCHITECTURE & WORKING

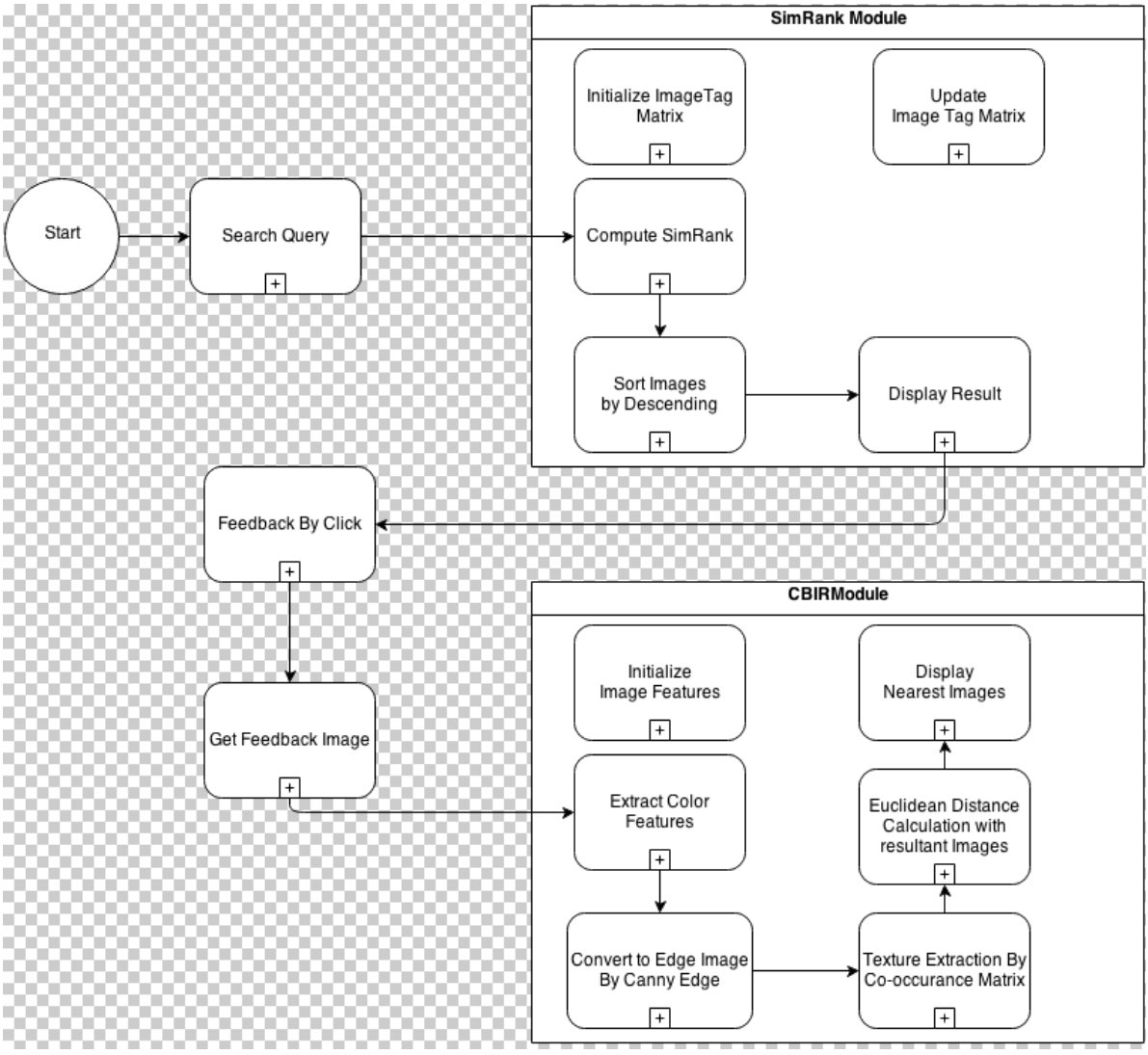

Fig1. *Architecture of CBIR system*

4.1. CBIR Working

To explain the system defined by methodology, two types of techniques are defined. String based searching for textual query & image based searching for image query. System has database which stores images & their tag files.

Textual query: User will enter the keyword for what kind of images he wants. It is assumed that keywords should match at least one tag from common tag file to generate the result. Textual query expansion & ranking of images is done using SimRank algorithm. On the basis of this query expansion, system retrieves & displays the pool of resultant images.

Query Image: User now has resultant image set from Textual query expansion. User will select an

image as a query image which is more similar to the image he wants.

For selecting a query image user has to give just one click on that image. So the system reduces user interface for better efficiency.

CBIR technique: Images from resultant set are compared with query image selected by user. This comparison is done on image attributes, Such as colour, edges & texture extraction. For colour extraction, colour moments algorithm is used. For edges, canny edge detection algorithm is used & for texture, texture extraction algorithm is used. On the basis of this images are compared with query image. Image with less difference in values is more similar image & get high priority. Images with high priorities ranked first & so on. System displays the modified resultant set as output.

5. ALGORITHMS

5.1. SIM Rank Algorithm

For textual query expansion we use SimRank algorithm.

Step 1:

In this system generate a matrix. In matrix rows consists of all tags which are present in image database & columns consists of all the images from database.

Step 2:

If tag is present in image then matrix value changed to 1 otherwise 0 & so on the matrix is build**.** When user enters textual query, that query matched with tags. Images from all matching tags are retrieved for resultant set.

Step 3:

Next system will read the tag files of resultant images & images with these tags are also retrieved for resultant set.

Step 4:

Now for ranking of the images, system will check that how many tags the image has other than query keywords entered by user.

Step 5:

An image with few other tags is more relevant & according to this ranking of images is done & resultant set is displayed to the user.

5.2. Colour Moment Algorithm

For colour extraction colour moment algorithm is used

Step 1:

System extracts the RGB (Red, Green, Blue) values for each image.

Step 2:

For every value of RGB, system calculates mean, median & standard deviation. These all value are stored in image database.

These all values are colour features of image. These values are going to be used for comparing colour features with other images. Less difference in value, more the relevant image.

5.3. Canny Edge Detection Algorithm

For detecting edge attributes of image canny edge detection algorithm is used

Step 1:

Blurring of images is done for reducing the noise from image.

Step 2:

System finds image gradients for every image. The edges are marked where the gradients of the image has large magnitudes.

Step 3:

Only local maxima marked as edges.

Step 4:

Potential edges are determined by thresholding.

Step 5:

Final edges are determined by suppressing all edges that are not connected to a very certain (strong) edge.

Step 6:

For every edge pixel value 1 is assigned & non-edge pixel value 0 is assigned & matrix is generated.

5.4. Texture Extraction Algorithm

For extracting texture attributes texture extraction algorithm is used.

Step 1:

The matrix from edge detection algorithm is taken for texture extraction.

Step 2:

Values for Texture attributes such as energy, brightness etc are calculated & stored.

These all values are Texture features of image. These values are going to be used for comparing Texture features with other images. Less difference in value, more the relevant image.

6. CONCLUSION

In this paper, we proposed a system in which Textual & visual expansions are integrated to capture user intention. It only requires one-click user feedback. Intention specific weight schema is proposed to combine visual features and to compute visual similarity adaptive to query images. Without additional human feedback, textual and visual expansions are integrated to capture user intention. Expanded keywords are used to extend positive example images and also enlarge the image pool to include more relevant images.

In the future work, this framework can be further improved by making use of the query log data, which provides valuable co-occurrence information of keywords, for keyword expansion. One shortcoming of the current system is that sometimes duplicate images show up as similar images to the query. This can be improved by including duplicate detection in the future work. Finally, to further improve the quality of re-ranked images, we intent to combine this work with photo quality assessment work in to re-rank images not only by content similarity but also by the visual quality of the images.

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