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Sketch4Match – Content-based Image Retrieval System Using Sketches

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Abstract- Image processing is the popular research area is based on the content image retrieval system, image search tools such as Webopedia, Google Images and Yahoo, image search based on textual annotation of images. Images are manually annotated with keywords and then retrieved using text-based search methods. Our analysis introduces the content based on a free hand sketch with the help of the existing methods which describes sketch colored image search is efficient, sequence of preprocessing steps that the transformed full color image and the sketch. Sketch based image retrieval system can be used as digital libraries, crime prevention etc, we compare this with previous technology and also analyzed the algorithm such a system has great data in suspects and identifying victims in forensics sketch to shot images which demands wide spectrum on the image processing.

Keywords- Image Processing, K-Means, Sketch, image database, query by sketch, matching, similarity

I. Introduction

Content-based image retrieval system retrieves an image from a database using visual information such as color, texture, or shape. In most systems, the user queries by presenting an example image that has the intended features[4,5,6].Although this approach has advantages in effective query processing, it is inferior in expressive power and the user cannot represent all intended features in his query. Before the spreading of information technology a huge number of data had to be managed, processed and stored. It was also textual and visual information. Parallelly of the appearance and quick evolution of computers an increasing measure of data had to be managed. The growing of data storages and revolution of internet had changed the world. The efficiency of searching in information set is a very important point of view. In case of texts we can search flexibly using keywords, but if we use images, we cannot apply dynamic methods. Two questions can come up. The first is who yields the keywords. And the second is an image can be well represented by keywords. In many cases if we want to search efficiently some data have to be recalled. The human is able to recall visual information more easily using for example the shape of an object, or arrangement of colors and objects. Since the human is visual type, we look for images using other images, and follow this approach also at the categorizing. In this case we search using some features of images, and these features are the keywords. At this moment unfortunately there are not frequently used retrieval systems, which retrieve images using the non-textual information of a sample image. What can be the reason? One reason may be that the text is a human abstraction of the image. To give some unique and identifiable information to a text is not too difficult. At the images the huge number of data and the management of those cause the problem. The processing space is enormous. Our purpose is to develop a content based image retrieval system, which can retrieve using sketches in frequently used databases. In the sketch based image retrieval system the user draws color sketches and blobs on the drawing area, the image were divided into grids and the color, texture features were determined. The grids were also used in other algorithms example like in the edge histogram descriptor method defect these methods is that they are not invariant opposite rotation, scaling and translation and other application of fuzzy logic or neural networks invest to determine suitable image features. The interaction between the user and content based image retrieval system can help in achieving better retrieval results and interaction ranges from simply allowing the user to submit a new query based on a existing one to giving the user the possibility to select part of the result image as relevant and non-relevant to allow the user visually arrange a small set of the database images into clusters of similar images and rearrange the whole database according the actions.

II. Applications

- The CBIR systems have a big significance in the criminal investigation.
- The identification of unsubstantial images, tattoos and graffities can be supported by these systems

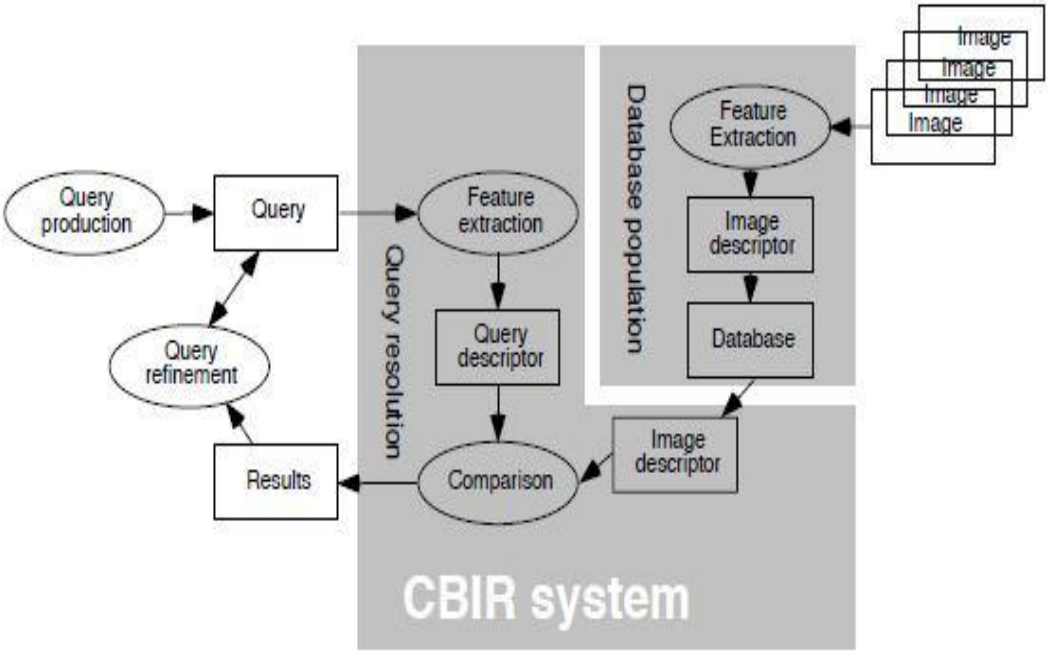

Fig 1: Shows the Content Based Image Retrieval System

III. Image Retrieval Systems

Since the early 1990s, content-based image retrieval has become a very active research area. Many image retrieval systems, both commercial and research, have been built. Most image retrieval systems support one or more of the following options :

- random browsing
- search by example
- search by sketch
- search by text (including key word or speech)
- navigation with customized image categories.

We have seen the provision of a rich set of search options today, but systematic studies involving actual users in practical applications still need to be done to explore the trade-offs among the different options mentioned above. Here, we will select a few representative systems and highlight their distinct characteristics.

IV. Our Project

In this section the goal and the global structure of our system is presented. The components and their communications

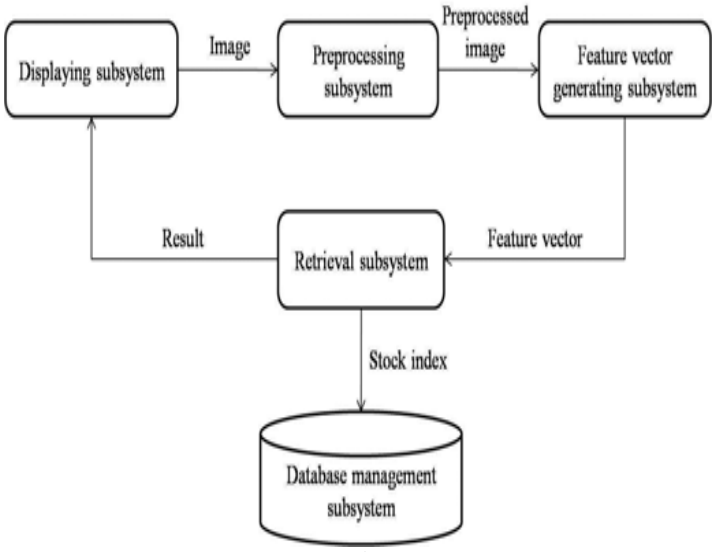

Fig. 2. The global structure of the system.

are introduced, and the functionality of subsystems and the algorithms are shown.

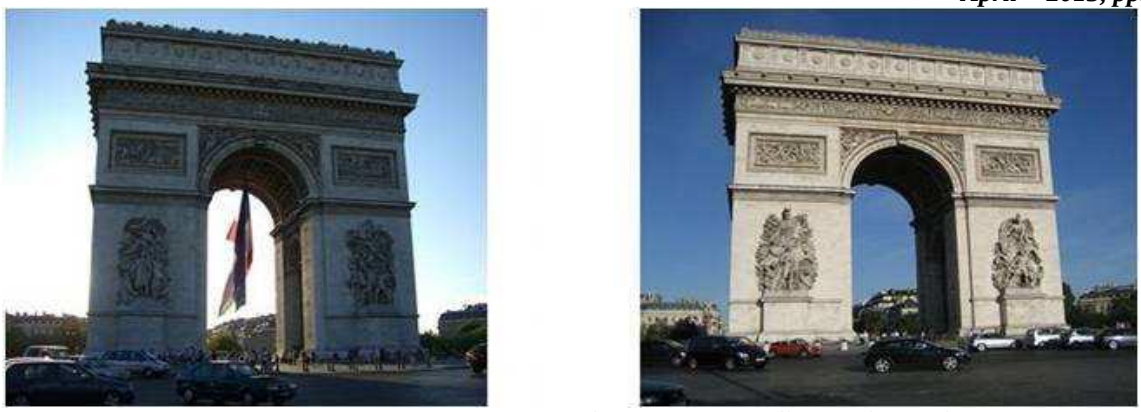

Fig. 3. The retrieval has to be robust in contrast of illumination and difference of point of view.

The system was designed for databases containing relatively simple images, but even in such cases large differences can occur among images in file size or resolution. In addition, some images may be noisier, the extent and direction of illumination may vary (see Fig. 3), and so the feature vectors cannot be effectively compared. In order to avoid it, a multistep preprocessing mechanism precedes the generation of descriptors.

V. Proposed Algorithm

The k-means algorithm:

Algorithm: k-means. The k-means algorithm for partitioning based on the mean value of the objects in the cluster.
Input: The number of clusters k and a database containing n objects.
Output: A set of k clusters that minimizes the squared error criterion.
Method:

1. arbitrarily choose k objects as the initial cluster centers.
2. Repeat
3. reassign each object to the cluster to which the object is the most similar, based on the mean value of the objects in the cluster;
4. Update the cluster means, i.e., calculate the mean value of the objects for each cluster;
5. Until no change.

In earlier days, image retrieving from large image database can be done by following ways. We will discuss briefly about the image retrieving of various steps Automatic Image Annotation and Retrieval using Cross Media Relevance Models Concept Based Query Expansion Query System Bridging The Semantic Gap For Large Image Databases Ontology-Based Query Expansion Widget for information Retrieval Detecting image purpose in World-Wide Web documents Benefits Relevance feedback is an interactive process that starts with normal CBIR. The user input a query, and then the system extracts the image feature and measure the distance with images in the database. An initial retrieval list is then generated. User can choose the relevant image to further refine the query, and this process can be iterated many times until the user find the desired images

VI. Conclusion

The objectives of system performs a test sketch-based image retrieval system, main aspects were the retrieval process has to be unconventional and highly interactive. The robustness of the method is essential in some degree of noise, which might also be in case of simple images. The drawn image without modification not be compared with color image, or its edge representation, alternatively will go for transform. The simple smoothing and edge detection based method was improved, which had a similar importance compare to as the previous system.

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