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SKETCH BASED IMAGE RETRIEVAL

Prof. S. B. Ambhore[1], Priyank Shah[2], Mahendra Desarda[3], Nawal Bedmutha[4]

[1]*Department of Computer Engineering, S.N.J.B's KBJ COE, Chandwad, santoshambhore2008@gmail.com*
[2]*Department of Computer Engineering, S.N.J.B's KBJ COE, Chandwad, priyank036@gmail.com*
[3]*Department of Computer Engineering, S.N.J.B's KBJ COE, Chandwad, mahendra.desarda333@gmail.com*
[4]*Department of Computer Engineering, S.N.J.B's KBJ COE, Chandwad, nawal.bedmutha@gmail.com*

Abstract- The content based image retrieval (CBIR) is one of the most common, increasing research areas of the digital image processing. Most of the existing image search tools, such as Google Images as well as Yahoo! Image search, are built on textual annotation of images. In these tools, images are physically annotated with keywords and then retrieved using text-based search methods. The presentations of these systems are not acceptable. The goal of CBIR is to extract visual content of an image automatically, like color, texture, otherwise shape. This paper purposes to introduce the problems and challenges concerned with the scheme and the creation of CBIR systems, which is based on a free hand sketch (Sketch based image retrieval – SBIR). With the help of the existing methods, describe a possible result how to design and implement a task specific descriptor, which can handle the informational gap among a sketch and a colored image, constructing an opportunity for the efficient search hereby. The used descriptor is built after such special sequence of preprocessing steps that the transformed full color image and the sketch can be compared.
The SBIR technology can be used in few applications such as digital libraries, crime prevention, as well as photo sharing sites. Such a system has excessive value in apprehending suspects and identifying victims in forensics and law enforcement. A possible application is similar a forensic sketch to a gallery of mugshot images. The range of retrieve images based on the visual content of the query picture intensified recently, which demands on the quite wide approach spectrum on the area of the image processing.
Keywords- CBIR (Content Based Image Retrieval), SBIR (Sketch Based Image Retrieval), Preprocessing subsystem, Feature vector generating subsystem, Retrieval subsystem, Display subsystem.

I. INTRODUCTION

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. Parallelism of the appearance and quick evolution of computers an increasing measure of data had to be managed. The rising of data storages and revolution of internet had changed the world. The efficiency of searching in material set is a very important point of view. In case of texts system can search flexibly using keywords, but if system use images, system cannot apply dynamic methods. Two queries are come up. The first is who yields the keywords. Then the second is an image can be well represented by keywords.

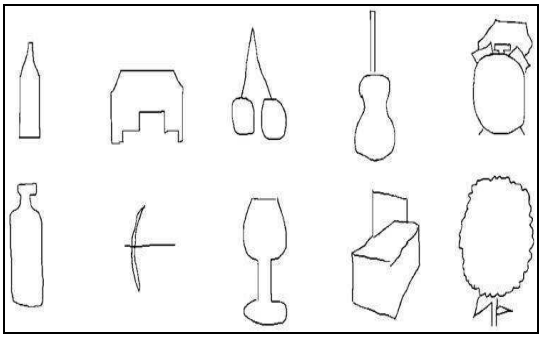

Fig 1: Sketch Images as Input

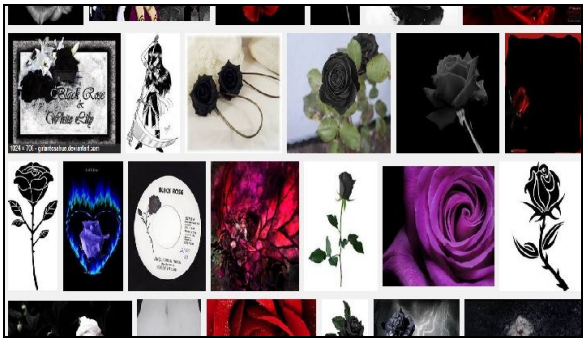

Fig 2: Image search result for black rose Google

In this case system search using some features of images, then these features are the keywords. At this moment unluckily there are not frequently used retrieval systems, which reclaim images using the non-textual information of a sample image. The image retrieval techniques based on visual image content has been in-focus for more than a decade. Many web-search-engines retrieve similar images by searching and matching textual metadata associated with digital images.

For better precision of the retrieved resulting images, this type of search requires associating meaningful image-descriptive-text-labels as metadata with all images of the database. Manual image labeling, known as manual image annotation, is practically difficult for exponentially increasing image database. The image search results, appearing on the first page for fired text query rose black, are shown in Figure 2 for important web search engines Google. Many resultant images of Figure 2 lack semantic matching with the query, showing huge scope of research leading to improvements in the state-of-art-techniques. The need evolved two solutions – automatic image annotation and content based image retrieval.

II. LITERATURE SURVEY

Various techniques for extraction and representation of image features like histograms – local (corresponding to regions or sub-image) or global, color layouts, gradients, edges, contours, boundaries as well as regions, textures and shapes.

Matusiak *et al.* applied curvature scale space (CSS) as a robust contour representation, although this required a pre-process to first extract the contour [2]. Bimbo and Pala present a technique which based on elastic matching of sketched templates over edge maps in the image to evaluate similarity [3]. Ip *et al.* develop an affine invariant contour descriptor for SBIR, based on the convex hull of the contour and the curvature of a set of dominant points along the contour [4]. Later approaches sought to combine global descriptors for color (e.g. RGB histogram) with shape (e.g. edge orientation histogram) as a depiction invariant similarity measure for trademark image retrieval [5].

Chans *et al.* tokenize edge segments into a string representation, encoding length, curvature, as well as relative spatial relationships [6]. Rajendran and Chang propose to extract edge signatures for both images and sketch query, as well as compare their curvature and direction histograms for shape similarity [7]. Chen et al *et al.* propose Sketch2Photo — an interactive system in which keyword annotated sketches are used to retrieve and composite photograph fragments [8].

III. SYSTEM ARCHITECTURE

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

as their communications are introduced, as well as the functionality of subsystems as well as the algorithms are shown.

3.1. The Purpose of the System

Even though the measure of research in sketch-based image retrieval increases, there is no broadly used SBIR system. Our goal is to develop a content-based associative search engine, which databases are available for anyone looking back to freehand drawing. The retrieval results are grouped by color for better clarity. Our most important task is to bridge the information gap between the drawing as well as the picture, which is helped by specific preprocessing transformation process.

3.2. The Global Structure of Our System

The system building blocks include a preprocessing subsystem, which removes the problems caused by the diversity of images. By feature vector generating subsystem our image can be represented by numbers considering a given property. The database management subsystem offers an interface between the database as well as the program. Based on the feature vectors and the sample image the retrieval subsystem provides the response list for the user using the displaying subsystem (GUI). The global structure of the system is shown in Fig. 3 [1].

The content-based retrieval as a process can be divided into two main phases. The first one is the database construction phase, the data of preprocessed images is stored in the form of feature vectors this is the off-line part of the program. This part carries out the calculation intensive tasks, which has to be done formerly the program actual use. The other stage is the retrieval process, which is the online unit of the program.

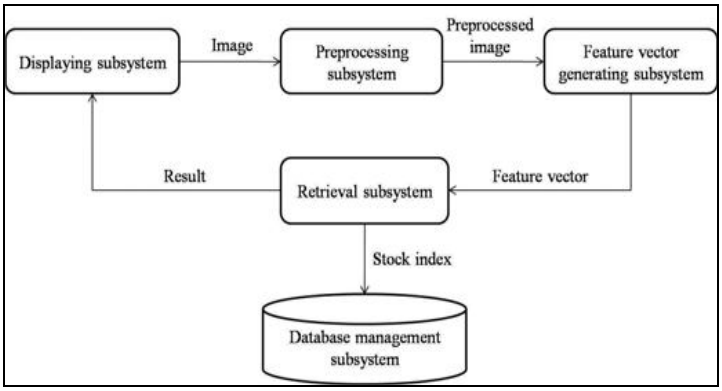

Fig. 3. The global structure of the system.

3.3. The Preprocessing Subsystem

The system was designed for databases containing relatively simple images, but even in such cases big differences can occur among images in file size or else resolution. In addition, some images may be noisier, the extent as well as direction of illumination may vary, and so the feature vectors cannot be effectively compared. In order to avoid it, a multistep preprocessing mechanism precedes the generation of descriptors. The input of the preprocessing subsystem is one image, as well as the output is the respective processed result set (see Fig. 4 [1]).

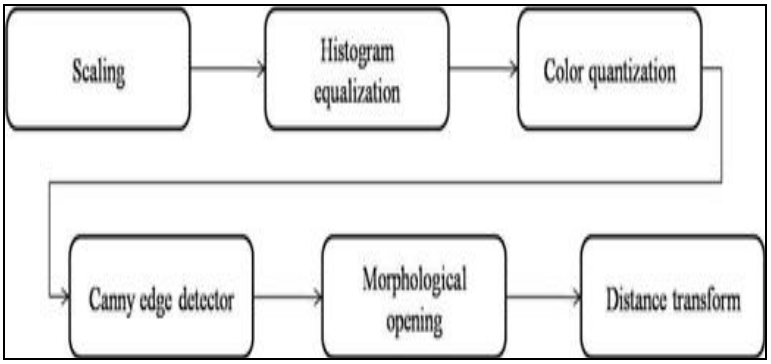

Fig. 4. The steps of preprocessing.

3.4. The Feature Vector Preparation Subsystem

In this subsystem the descriptor vectors representing the content of images are made. Essentially three different methods were used, namely the edge histogram descriptor (EHD), the histogram of oriented gradients (HOG) and the scale invariant feature transform (SIFT).

3.5. The Retrieval Subsystem

As the feature vectors are ready, the retrieval can start. In place of the retrieval the distance based search was used with Minkowski distance, as well as the classification-based retrieval.

3.6. The Database Management Subsystem

This is the database management subsystem, which contains of three parts, the storage, the retrieval, as well as the data manipulation modules. The storage module offers images, information as well as the associated feature vectors are uploaded to the database.

3.7. The Displaying Subsystem

The number of results to show in the user interface is an essential aspect. Prima facie the first n pieces of results can be displayed, which suitably can be placed in the user interface. This number depends on the perseverance of the monitor, as well as forasmuch the large resolution monitors are widely used, so this number can move between 20 and 40. Another approach is to define the maximum number of results (n), but we also observe that how the goodness of individual results can vary. If the retrieval efficiency is worse by only a given ratio, the image can be involved in the display list. In our system the possible results are classified, and the obtained clusters are displayed. Hence the solution set is more ordered and transparent.

CONCLUSION

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

REFERENCES

[1] B. Sz´ant´o, P. Pozsegovics, Z. V´amossy, Sz. Sergy´an, "Sketch4Match – Content–based image retrieval system using sketches". In: 9th IEEE International Symposium on Applied Machine Intelligence and Informatics, SAMI 2011.
[2] Matusiak, S., Daoudi, M., Blu, T., Avaro, O., 1998. "Sketch based images database retrieval". In: International Workshop on Advances in Multimedia Information Systems. pp. 185-191.
[3] del Bimbo, A., Pala, P., 1997. "Visual image retrieval by elastic matching of user sketches", in: PAMI, pp. 121-132.
[4] Ip, H. H. S., Cheng, A. K. Y., Wong, W. Y. F., Feng, J., 2001. "Affine-invariant sketch-based retrieval of images". In: International Conference on Computer Graphics. pp. 55-61.
[5] Jain, A. K., Vailaya, A., 1996. "Image retrieval using color and shape. In: Pattern Recognition", pp. 1233-1244.
[6] Chans, Y., Lei, Z., Lopresti, D., Kung, S. Y., 1997. "A feature based approach for image retrieval by sketch". In: SPIE Storage and retrieval for image and video databases.
[7] Rajendran, R., Chang, S., 2000. "Image retrieval with sketches and compositions". In: ICME. pp. 717-720.
[8] Chen, T., Cheng, M.-M., Tan, P., Ariel, S., Hu, S.-M., 2009. "Sketch2Photo: internet image montage". In: ACM Trans. Graph. 28 (5), pp. 1.

