Response Rank based Sketch-Content Image Retrieval Search System

V. Jeevitha[1] T. Pinoshini[2] N. Swathikiruthiga[3] M. S. Vijaykumar[4]
[1,2,3]B.Tech Student [4]Assistant Professor
[1,2,3,4]Department of Information Technology
[1,2,3,4]Tejaa Shakthi Institute of Technology for Women, Coimbatore, India

Abstract— Sketch-based searching is a method that allows users to draw generic search queries and return similar drawn images, giving more user control over their search content. Sketch-based image retrieval often needs to optimize the trade-off between efficiency and precision. Index structures are typically applied to large-scale databases to realize efficient retrievals. However, the performance can be affected by quantization errors. Sketch-based image retrieval systems that preserve the index structure are challenging. In this work, an effective sketch-based image retrieval approach with re ranking and relevance feedback schemes is implemented. The current approach makes full use of the semantics in query sketches and the top ranked images of the initial results. It also apply relevance feedback to find more relevant images for the input query sketch. The integration of the two schemes results in mutual benefits and improves the performance of sketch-based image retrieval.

Key words: Image Retrieval Search System, Response Rank, Sketch-based Searching

I. INTRODUCTION

Developments in Internet and mobile devices have increased the demand for powerful and efficient information retrieval tools. Content-based image retrieval (CBIR) mainly uses text and images for queries. Sketch-based image retrieval (SBIR) methods use a hand-drawn sketch composed of simple strokes or lines to fulfill the image retrieval task. A sketch is generally a rough description of an object's shape and contours. Traditional draw and search systems require that the input sketch is colored and similar to a real photo. The user must draw the sketch carefully and color it to make the sketch visually similar to the natural scene images. Then, CBIR fuses different features (such as shape, color, and texture) together to perform retrieval. However, this method will burden users by requiring detailed drawings, and most importantly, it does not solve the core problem of SBIR, i.e., matching a line-formed sketch and colored images.

A simple and similar image is needed for image-based retrieval. But for SBIR, results may vary dramatically if the user's drawing skills are not sophisticated, or if the target cannot be simply depicted using only lines. For example, if a user is looking for pictures of a pyramid but they can only draw a triangle, sketch-based retrieval becomes very challenging. The sketch is a drawing that uses different words to represent diverse objects. Their locations and sizes are represented by the words. In this sense, it is like a concept-based image retrieval system instead of a sketch-based method.

II. PRELIMINARIES

A. Query-Adaptive Shape Topic Mining for Hand-Drawn Sketch Recognition

The main objective of ARP is to transform the image data into a new structure that supports measurement of the similarity between images in an effective, easy and efficient manner with emphasis on capturing scale and rotation invariant properties. Applying an edge extraction operator, e.g. canny edge operator, on this grey-scale image results in an edge image. In order to achieve the scale invariance property, the resulting edge image is then normalized to WW pixels. This normalized edge image is called I and used for feature extraction. In the following, we consider pixels I or Þ to be either equal to '1' for edge pixels or '0' for non-edge pixels. The algorithm uses the surrounding circle of I for partitioning it to M N sectors, where M is the number of radial partitions and N is the number of angular partitions. The angle between adjacent angular partitions is ¼ 2p=N and the radius of successive concentric circles is r ¼ R=M.

B. Benchmark & Bag-of-Features Descriptors

Retrieving images to match with a hand-drawn sketch query is a highly desired feature, especially with the popularity of devices with touch screens. The proposed solution simultaneously considers storage cost, retrieval accuracy, and efficiency, based on which we have developed a real-time sketch-based image search engine by indexing more than 2 million images. Extensive experiments on various retrieval tasks (basic shape search, specific image search, and similar image search) show better accuracy and efficiency than state-of-the-art methods

C. An Evaluation of Descriptors for Large-Scale Image Retrieval from Sketched Feature Lines

Content-based image retrieval (CBIR) information systems use information extracted from the content of images for retrieval, and help the user retrieve images relevant to the contents of the query. Complete image classification, indexing and retrieval based on the content interpretation require semantic interpretation and cannot be afforded with current technology. Several systems have been proposed in recent years in the framework of content-based retrieval. It here the emphasis is in avoiding any user specification but the submitted query sketch.

D. Object Recognition from Local Scale-Invariant Feature

Object Recognition retrieval is tantamount to measure similarity between a given query and image candidates .There are two main attributes related to similarity measures namely image features and similarity metrics. Similarity metrics are the tools for measurement of similarity between an image query and image candidates. The metrics are the keys for image retrieval. The choice of a metric directly relies upon

the choice of features. For instance, sub-string matching is appropriate for keywords.

E. Query-Adaptive Shape Topic Mining for Hand-Drawn Sketch Recognition

Our image ranking algorithm is based on descriptors which capture the main directions in each part of the image and are computed for all images in the database in an offline process. During the query, the user sketch provides direction information for each spatial region in the sketch and the descriptor generated from it is simply compared against all descriptors in the database.

III. EXISTING SYSTEM

Traditional draw and search systems require that the input sketch is colored and similar to a real photo. This approach converts sketch-based retrieval to content-based image retrieval. The user must draw the sketch carefully and color it to make the sketch visually similar to the natural scene images. Then, traditional algorithm uses different features (such as shape, color, and texture) together to perform retrieval. However, this method will burden users by requiring detailed drawings, and most importantly, it does not solve the core problem

A. Disadvantages of Existing System

- The problem in sketch-based image retrieval is how to measure the relevance of an image and a query sketch.
- In the existing based methods, visual re-ranking is formulated as binary classification problem aiming to identify whether each search result is relevant or not.
- The framework casts the re-ranking problem as random walk on an affinity graph and reorders images according to the visual similarities.

IV. PROPOSED SYSTEM

The proposed system that uses several techniques, including relevant image grouping, re-ranking via visual feature verification (RVFV), and contour-based relevance feedback (CBRF). The RVFV approach removes noisy images and makes the top ranked images more relevant to the input query sketch. The CBRF approach uses the contours of the top-ranked images obtained by the SBIR system as new queries to find more relevant images. We apply RVFV again to remove irrelevant images that introduced in the CBRF stage. With a small increase in complexity, the sketch retrieval system can retrieve more desired images

A. Advantages of Proposed System

- It proposes a novel attribute-assisted retrieval model for re ranking images.
- It proposed iterative regularization framework could further explore the semantic similarity between images by aggregating their local
- Compared with the previous method, a hyper graph is reconstructed to model the relationship of all the images, in which each vertex denotes an image and a hyper edge represents an attribute and a hyper edge connects to multiple vertices.

V. CONCLUSION:

In this work, we described Sketch Seeker, a sketch retrieval system for finding sketches similar to a given query sketch. We use both shape context and SIFT key-point descriptors in the matching framework. These sketch representations are then heavily compressed using deep auto encoding and stored in a KD tree for enormous improvements in storage and speed efficiency.

Finally, we rank the result set retrieved for an input sketch by the semantic interpretation of the query paired with median filtering on the distance of the matches to the query sketch. Our approach toward sketch retrieval closely follows the design for any generic text or image retrieval system. The three subsystems described in our work—indexing, retrieval, and ranking—can be extended to design a domain-specific sketch recognition system that can be used for specific tasks such as logo/trademark retrieval, engineering drawing retrieval, clipart finding, or multimodal searching systems. Furthermore, the nearest neighbor search technique could be used to provide real-time suggestions for stroke completion to a user of a sketch-based interface. Overall, we show that Sketch Seeker is a highly efficient sketch retrieval system in terms of time and space that obtains excellent similarity results for general input query sketches. With its compression, speed, and accuracy, it has many potential extensions for further application in specific sketch domains.

REFERENCES

[1] J. O. Wobbrock, A. D. Wilson, and Y. Li, "Gestures without libraries, toolkits or training: A $1 recognizer for user interface prototypes," in Proc. 20th Annu. ACM Symp. User Interface Softw. Technol., New York, NY, USA: ACM, 2007, pp. 159–168. [Online]. Available: http://doi.acm.org/10.1145/1294211.1294238

[2] O. Atilola et al., "Mechanix: A natural sketch interface tool for teaching truss analysis and free-body diagrams, Artif. Intell. Eng. Des. Anal. Manuf., vol. 28, pp. 169–192, 2014. [Online]. Available:

[3] M. Eitz, K. Hildebrand, T. Boubekeur, and M. Alexa, "Sketch-based 3D shape retrieval," in Proc. ACM SIGGRAPH 2010: Talks, 2010, Art. No. 5.

[4] R. G. Schneider and T. Tuytelaars, "Sketch classification and classification-driven analysis using fisher vectors," ACM Trans. Graph., vol. 33, no. 6, pp. 174:1–174:9, 2014.

[5] B. Paulson and T. Hammond, "MARQS: Retrieving sketches learned from a single example using a dual-classifier," J. Multimodal User Interfaces, vol. 2, no. 1, pp. 3–11, 2008. [Online]. Available: http://dx.doi.org/10.1007/s12193-008-0006-0

